



Full wwPDB EM Validation Report ⓘ

Aug 16, 2025 – 12:55 PM EDT

PDB ID : 9BM1 / pdb_00009bm1
EMDB ID : EMD-44684
Title : State-3 of motor domain from full-length human dynein-1 in 5mM ATP
Authors : Chai, P.; Zhang, K.
Deposited on : 2024-05-02
Resolution : 3.02 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev126
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.45.1

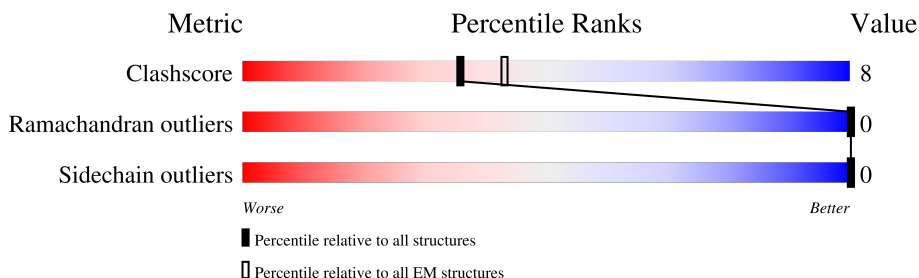
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.02 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	4646	

2 Entry composition [i](#)

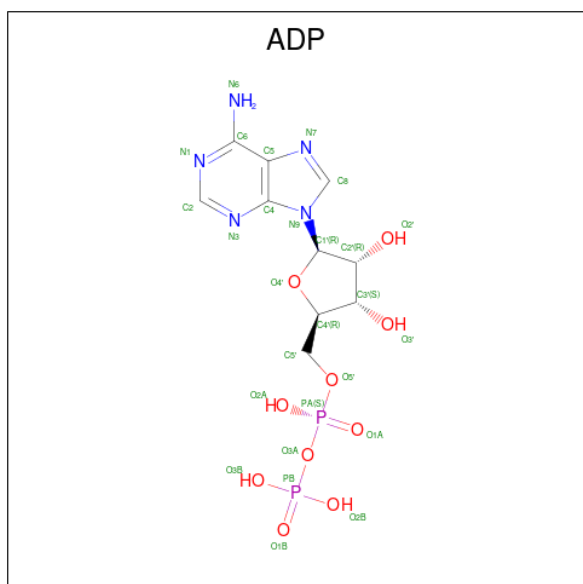
There are 4 unique types of molecules in this entry. The entry contains 23051 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Cytoplasmic dynein 1 heavy chain 1.

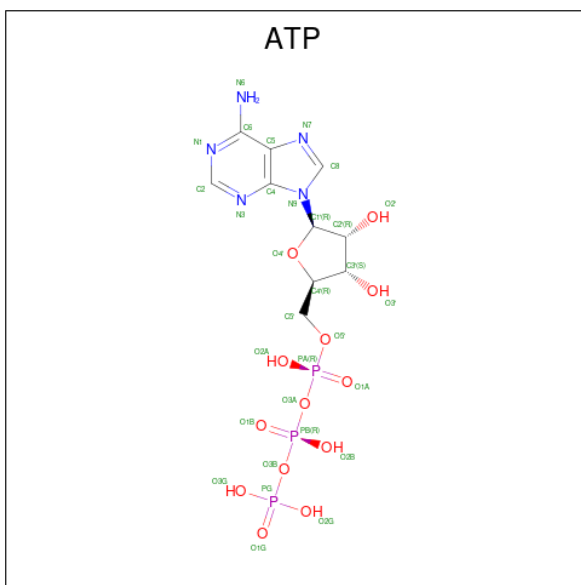
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2859	22937	14604	3961	4259	113	1	0

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0
2	A	1	27	10	5	10	2	0
2	A	1	27	10	5	10	2	0

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	5	13	3	

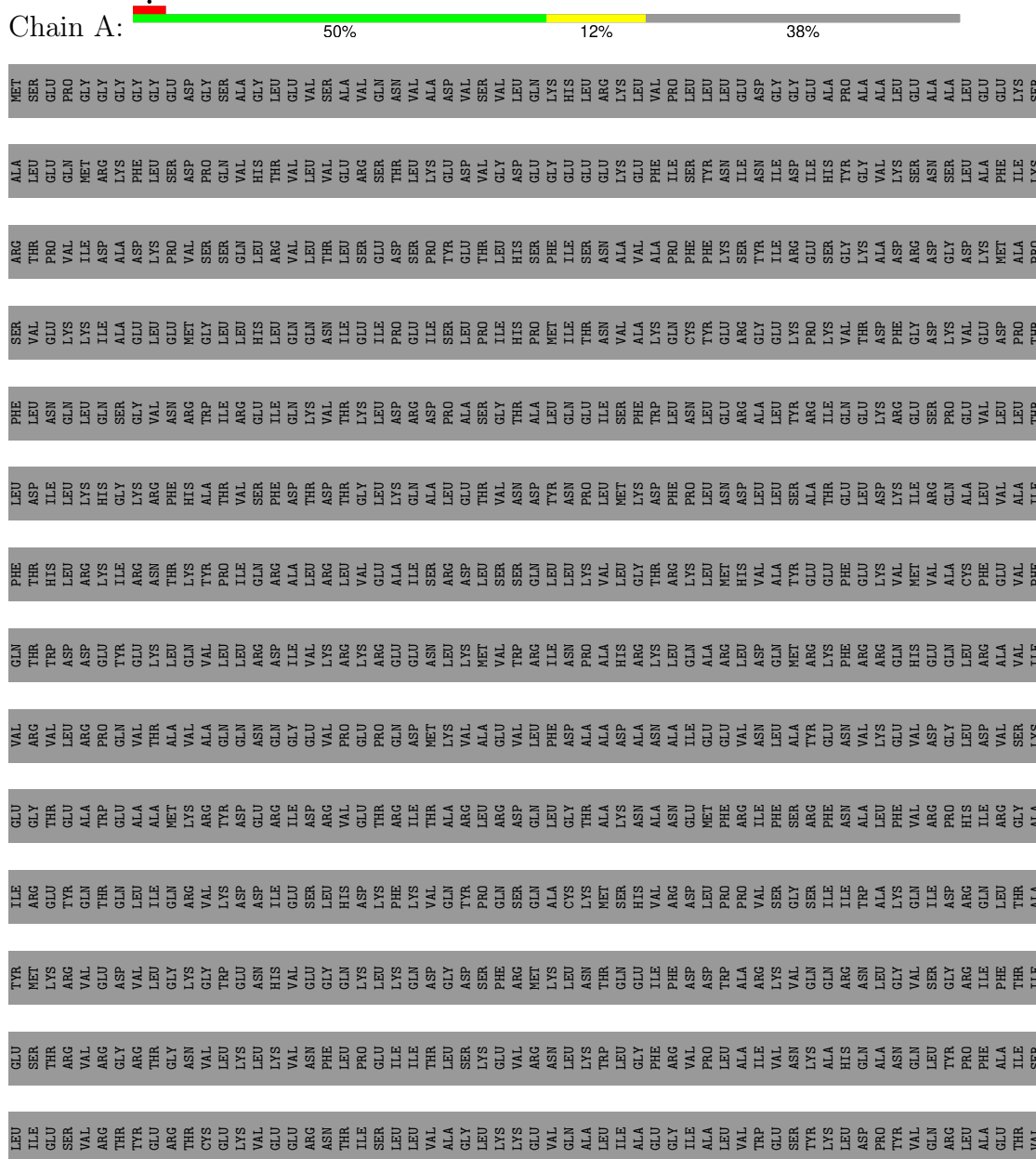
- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
4	A	2	Total 2	Mg 2	0

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Cytoplasmic dynein 1 heavy chain 1



M2018	N2019	P2020	G2021	Y2022	R2025	L2032	L2039	A2040	M2041	T2042	D2045	E2046	Q2047	L2048	T2049	A2066	T2069	V2070	P2071	L2075	E2078	D2087	R2091	N2102	E2106	R2107	K2110	E2117	R2118	Q2119	E2120	A2121	V2122	D2123	L2131	P2132	E2135	T2138	Q2139	C2142	E2143									
V2146	P2147	K2148	L2149	L2157	F2165	E2174	M2175	R2179	E2180	E2181	L2182	K2183	K2184	Q2187	E2188	D2195	L2208	Y2211	M2221	G2224	S2231	M2232	A2233	V2234	L2237	L2244	E2245	Y2265	N2271	D2277	T2281	R2285	K2297	R2298	D2308	W2311	V2312													
E1635	Q1850	Q1856	I1859	Y1868	K1645	K1649	H1653	I1664	I1676	I1698	N1699	E1700	W1701	L1704	V1711	T1712	L1713	A1714	K1715	V1721	V1724	F1727	D1734	P1735	N1736	T1737	I1739	G1771	G1772	G1773	D1774	A1775	A1793	V1796	E1814	F1836	L1839	R1843												
F1568	Q1569	S1572	T1573	E1574	F1575	L1576	A1577	L1578	M1579	K1580	K1581	V1582	S1583	K1584	S1585	P1586	L1587	V1588	M1589	D1590	V1591	L1592	M1593	I1594	Q1595	V1597	Q1598	R1599	E1602	R1603	L1604	D1606	L1607	L1608	G1609	K1610	I1611	Q1612	K1613	A1614	L1615	G1616	E1617	E1620	R1623	F1626	F1629	Y1630	F1631	V1632
ASN	GLU	ALA	ILE	VAL	LYS	VAL	LEU	LEU	VAL	VAL	GLN	MET	ALA	GLU	GLU	PHE	LEU	LYS	GLN	ASN	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR		
ASN	ASN	GLU	ALA	ILE	VAL	VAL	LYS	ASP	VAL	LEU	LEU	LEU	VAL	VAL	GLN	GLY	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR			
GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	SER	TYR	GLU	PHE	VAL	GLN	ARG	GLY	LEU	LEU	ILE	ASN	ILE	VAL	GLU	GLY	ILE	ASN	PHE	GLY	PHE	GLY	ILE	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL		
ASN	ASN	GLU	ALA	ILE	VAL	VAL	LYS	ASP	VAL	VAL	GLN	MET	ALA	GLU	GLU	PHE	LEU	LYS	GLN	ASN	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR		
GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ASN	ASN	GLU	ALA	ILE	VAL	VAL	LYS	ASP	VAL	VAL	GLN	MET	ALA	GLU	GLU	PHE	LEU	LYS	GLN	ASN	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR		
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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GLU	LEU	ARG	ILE	THR	GLN	MET	ASN	PRO	ASP	LYS	SER	THR	GLY	VAL	VAL	GLN	ASP	TRP	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR				
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ASN	ASN	GLU	ALA	ILE	VAL	VAL	LYS	ASP	VAL	VAL	GLN	MET	ALA	GLU	GLU	PHE	LEU	LYS	GLN	ASN	GLY	ILE	VAL	TRP	THR	GLN	GLY	ASP	VAL	LEU	LEU	GLN	GLY	TRP	LEU	LYS	ASP	GLY	GLN	ILE	PRO	THR	ALA	ARG	LEU	ARG	GLN	TYR		
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ALA	LEU	LEU	VAL	ILE	ARG	LYS	THR	ASP	LYS	SER	THR	GLY	VAL	THR	ASP	GLU	ASP	TRP	GLY	ILE	VAL																													

V3849	S3694	D3546	E3450	GLY	GLU	VAL	K3209	L2946	M2799	A2564	D2320	D2321	L2324	E2331	R2332	W2338	F2343	Q2346	V2356	C2359	G2360	M2361	W2373	L2382	L2387	D2388	E2389	GLY	GLU	ASP	GLU	ALA	GLN	ARG	ARG	LYS	LYS	GLY	GLY	ASP	GLU	GLY	GLU	GLU	ALA	ALA	S2410	I2415	Q2416	A2419	A2420	M2423	V2562	A2563																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
R3695	R3696	A3548	Y3451	PRO	SER	ILE	E3210	L3091	F3094	V2950	W2802	V2803	R2804	L2816	P2817	G2820	W2825	A2829	Q2834	T2604	F2622	E2665	I2666	F2682	M2686	D2697	C2712	V2731	P2732	W2736	D2737	Y2738	I2747	A2748	Q2485	L2486	E2487	Q2491	R2492	Y2493	I2498	D2505	M2510	Y2517	I2521	L2526	N2531	I2534	W2545	K2561	S2795	P2796																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
T3697	L3708	E3551	V3453	VAL	THR	ASP	V3212	F3094	G3095	M2953	D3096	W3097	S3098	T3099	E3100	T3110	E3116	D3124	Y3125	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
L3716	L3717	S3552	L3454	ILE	LYS	TRP	D3213	K3214	V3215	E3216	E3217	L3218	R3219	R3220	D3221	L3222	R3223	I3224	K3225	S3226	Q3227	E3228	V3231	K3232	N3233	A3234	A3235	A3236	N3237	D3238	K3239	L3240	K3241	K3242	MET	VAL	LYS	ASN	MET	TYR	ALA	ASN	MET	ASN	PRO	ASN	PRO	ALA	ALA	GLY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
L3718	K3718	L3553	S3456	ALA	ILE	GLN	Q3214	D3096	W3097	L2956	L2961	K2962	K2966	Y2967	E2974	D2975	L2976	R2977	L2980	S2983	K2989	I2990	D2995	N2998	D3001	S3002	F3021	Y3026	L2889	R2890	K2894	A2895	R2896	L2909	V2910	L2911	V2919	L2920	I2925	Q2930	L2933	I2936	K2943																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
K3718	D3723	R3559	Q3457	GLN	ARG	SER	E3217	E3100	T3110	K2966	Y2967	T3110	E3116	D3124	Y3125	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
V3724	V3724	Q3563	Q3459	ASN	ILE	ASP	R3219	T3110	E3116	Y2967	E2974	D2975	L2976	R2977	L2980	S2983	K2989	I2990	D2995	N2998	D3001	S3002	F3021	Y3026	L2889	R2890	K2894	A2895	R2896	L2909	V2910	L2911	V2919	L2920	I2925	Q2930	L2933	I2936	K2943																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
L3731	L3731	D3570	K3461	ASP	ARG	MET	R3221	E3116	D3124	Y3125	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
R3743	R3743	D3571	K3462	MET	GLU	VAL	L3222	D3124	Y3125	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
K3747	K3747	L3580	D3464	ARG	ILE	PRO	I3224	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
N3754	E3755	R3585	L3465	PRO	THR	ILE	S3226	V3129	Y3130	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
V3756	K3757	I3600	V3468	LEU	VAL	ALA	Q3227	D3131	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
G3758	G3758	R3611	E3469	ASN	PHE	ASN	V3231	Q3135	P3136	P3137	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
R3759	R3759	E3624	K3471	GLY	GLU	ALA	K3232	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
I3760	I3761	E3624	K3471	LEU	GLU	ALA	N3233	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
G3919	L3761	R3628	V3472	LYS	SER	ILE	A3234	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
S3920	D3762	F3629	N3473	GLU	SER	ILE	A3235	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
T3921	D3763	F3629	T3476	LEU	ASP	ALA	N3236	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
D3764	D3764	P3628	T3476	GLY	ASN	GLN	A3237	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
T3765	T3765	G3630	L3479	ASP	ILE	HIS	D3237	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
L3766	L3766	L3634	L3479	ALA	ILE	HIS	D3238	R3140	I3143	V3148	F3149	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
I3928	L3927	V3635	K3480	LYS	ARG	LEU	K3239	Q3152	T3153	L3154	A3157	L3161	T3172	E3048	E3049	L3050	Y3051	F3054	Q3057	V3058	I3059	R3060	T3067	D3077	R3078	T3081																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	105800	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.053	Depositor
Minimum map value	-0.542	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.030	Depositor
Recommended contour level	0.13	Depositor
Map size (Å)	332.80002, 332.80002, 332.80002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, ATP, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.19	0/23422	0.32	0/31746

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2022[B]	TYR	Mainchain
1	A	2025	ARG	Sidechain

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	22937	0	23006	348	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	81	0	36	4	0
3	A	31	0	12	2	0
4	A	2	0	0	0	0
All	All	23051	0	23054	348	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (348) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1879:LEU:HD21	1:A:1914:GLU:HB3	1.51	0.91
1:A:3110:THR:O	1:A:3140:ARG:NH1	2.20	0.75
1:A:2149:LEU:HD11	1:A:2157:LEU:HD13	1.71	0.73
1:A:4470:PRO:HD2	1:A:4473:MET:HE2	1.71	0.73
1:A:2894:LYS:HG3	1:A:2911:LEU:HD12	1.71	0.72
1:A:3499:GLN:OE1	1:A:3544:ARG:NH2	2.22	0.71
1:A:3851:ASP:HB3	1:A:3854:GLN:HG2	1.72	0.70
1:A:1914:GLU:HG3	2:A:4701:ADP:H2'	1.75	0.67
1:A:1914:GLU:HG2	2:A:4701:ADP:O1A	1.94	0.67
1:A:3100:GLU:HG2	1:A:3130:TYR:HE1	1.59	0.67
1:A:3517:ALA:HB1	1:A:3525:ARG:HG2	1.76	0.66
1:A:3178:ASP:OD2	1:A:3585:ARG:NE	2.28	0.66
1:A:1879:LEU:CD2	1:A:1914:GLU:HB3	2.23	0.65
1:A:1623:ARG:NH1	1:A:1629:PHE:O	2.30	0.65
1:A:1907:PRO:HD2	1:A:2042:THR:HA	1.80	0.63
1:A:4069:ILE:HD13	1:A:4080:ALA:HA	1.81	0.63
1:A:2751:PHE:HB3	1:A:2803:VAL:HG11	1.80	0.63
1:A:2433:VAL:HG22	1:A:2498:ILE:HD11	1.80	0.63
1:A:2890:ARG:NH1	1:A:2911:LEU:O	2.32	0.63
1:A:3638:VAL:HG12	1:A:3681:THR:HB	1.79	0.63
1:A:2471:GLN:NE2	1:A:2475:ASN:OD1	2.31	0.62
1:A:1929:VAL:H	1:A:2332:ARG:HH22	1.47	0.62
1:A:3990:LEU:HA	1:A:4004:MET:HG2	1.82	0.61
1:A:3481:SER:HB3	1:A:3774:LYS:HE2	1.80	0.61
1:A:2179:ARG:NH1	1:A:2195:ASP:OD1	2.33	0.61
1:A:1904:PRO:HG2	1:A:2017:THR:HG22	1.83	0.61
1:A:2562:VAL:O	1:A:2804:ARG:NH1	2.33	0.61
1:A:4037:PRO:HB2	1:A:4118:PRO:HG2	1.81	0.61
1:A:3207:LYS:HE3	1:A:3758:GLY:HA2	1.82	0.61
1:A:3731:LEU:HD11	1:A:3790:VAL:HG12	1.83	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1879:LEU:HD21	1:A:1914:GLU:CB	2.28	0.60
1:A:3839:VAL:HG21	1:A:3863:LEU:HA	1.84	0.60
1:A:1612:GLN:NE2	1:A:1635:GLU:OE1	2.34	0.60
1:A:2449:LEU:HA	1:A:2453:ARG:HH21	1.66	0.60
1:A:4088:VAL:HG11	1:A:4116:LEU:HD21	1.84	0.60
1:A:1814:GLU:HB2	1:A:1878:LYS:NZ	2.16	0.59
1:A:3030:MET:HE1	1:A:3051:TYR:HB2	1.84	0.59
1:A:2775:GLU:O	1:A:2779:MET:HG3	2.01	0.59
1:A:2481:MET:HE2	1:A:2486:LEU:HA	1.83	0.59
1:A:2443:LEU:HB3	1:A:2510:MET:HE3	1.84	0.59
1:A:3520:PHE:HB3	1:A:3524:MET:HB3	1.84	0.59
1:A:4339:MET:HG2	1:A:4343:MET:HE2	1.85	0.59
1:A:2078:GLU:O	1:A:4415:ARG:NH2	2.36	0.59
1:A:4234:SER:HB3	1:A:4237:LYS:HG2	1.84	0.58
1:A:2071:PRO:O	1:A:2075:LEU:HG	2.03	0.58
1:A:1836:PHE:HA	1:A:1839:LEU:HB2	1.86	0.58
1:A:2221:MET:HG2	1:A:2343:PHE:HB2	1.86	0.58
1:A:2446:ILE:HG22	1:A:2505:ASP:HB2	1.85	0.57
1:A:3708:LEU:HD23	1:A:3809:SER:HA	1.87	0.57
1:A:1881:GLN:HG3	1:A:1886:ASP:OD1	2.03	0.57
1:A:2682:PHE:O	1:A:2686:MET:HG3	2.03	0.57
1:A:1561:LEU:O	1:A:1565:THR:OG1	2.17	0.57
1:A:3510:SER:HB3	1:A:3553:LEU:HD21	1.86	0.57
1:A:2382:LEU:HD23	1:A:2420:ALA:HB2	1.87	0.56
1:A:3129:VAL:HG21	1:A:3149:PHE:HB2	1.87	0.56
1:A:3534:HIS:O	1:A:3538:GLN:HG3	2.05	0.56
1:A:4150:PRO:O	1:A:4195:ARG:NH2	2.36	0.56
1:A:1839:LEU:O	1:A:1843:ARG:NH1	2.38	0.56
1:A:2816:LEU:HD11	1:A:2820:GLY:HA3	1.87	0.56
1:A:4107:MET:O	1:A:4111:LYS:HG2	2.05	0.56
1:A:4470:PRO:HG3	1:A:4612:ASN:HD22	1.71	0.56
1:A:2419:ALA:O	1:A:2423:MET:HG3	2.05	0.56
1:A:2775:GLU:OE1	1:A:2857:HIS:NE2	2.32	0.56
1:A:2139:GLN:O	1:A:2143:GLU:HG3	2.06	0.55
1:A:3743:ARG:O	1:A:3747:LYS:HG3	2.06	0.55
1:A:1664:ILE:HG22	1:A:1676:ILE:HG22	1.87	0.55
1:A:3099:THR:HG23	1:A:3148:VAL:HG11	1.88	0.55
1:A:2297:LYS:O	1:A:2338:ASN:ND2	2.37	0.55
1:A:1897:GLU:O	1:A:1899:ARG:NH1	2.39	0.55
1:A:2569:VAL:HG11	1:A:2747:ILE:HA	1.89	0.55
1:A:2876:TRP:HH2	1:A:2919:VAL:HG22	1.71	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4178:ARG:NH2	1:A:4297:PRO:O	2.40	0.55
1:A:2181:GLU:HG3	1:A:2244:LEU:HB2	1.87	0.55
1:A:3585:ARG:HB2	1:A:3697:THR:HG23	1.88	0.55
1:A:2388:ASP:OD1	1:A:2389:GLU:N	2.40	0.55
1:A:1946:VAL:HG22	1:A:2006:VAL:HG21	1.88	0.54
1:A:4381:HIS:HB2	1:A:4438:CYS:HB3	1.88	0.54
1:A:4525:ARG:NH2	1:A:4539:LEU:O	2.40	0.54
1:A:1721:VAL:HA	1:A:1724:VAL:HG12	1.89	0.54
1:A:3135:GLN:O	1:A:3137:PRO:HD3	2.07	0.54
1:A:3191:ARG:HG2	1:A:3503:ILE:HD13	1.88	0.54
1:A:2983:SER:HB3	1:A:2990:ILE:HD12	1.88	0.54
1:A:2075:LEU:HD21	1:A:4536:LEU:HD11	1.90	0.54
1:A:2561:LYS:O	1:A:2567:VAL:HG21	2.08	0.54
1:A:4137:ASN:OD1	1:A:4138:LEU:N	2.41	0.54
1:A:3580:LEU:HD13	1:A:3600:ILE:HD11	1.90	0.54
1:A:3194:LEU:HD12	1:A:3197:GLN:HE21	1.74	0.53
1:A:3825:TYR:OH	1:A:3879:ASP:OD2	2.22	0.53
1:A:3891:LYS:HD2	1:A:4013:LEU:HD23	1.89	0.53
1:A:4490:GLN:O	1:A:4494:LEU:HG	2.09	0.53
1:A:3691:ASP:OD1	1:A:3692:LEU:N	2.40	0.53
1:A:4326:ASN:ND2	1:A:4579:ASN:O	2.42	0.53
1:A:2872:LEU:HD22	1:A:2920:LEU:HD12	1.91	0.52
1:A:4287:LYS:H	1:A:4293:ASP:HB3	1.74	0.52
1:A:2265:TYR:OH	1:A:2311:TRP:O	2.26	0.52
1:A:3172:THR:HG21	1:A:3694:SER:HB3	1.91	0.52
1:A:2107:ARG:NH2	1:A:2139:GLN:OE1	2.43	0.52
1:A:4227:ALA:HB2	1:A:4233:ILE:HD12	1.92	0.51
1:A:2231:SER:HA	1:A:2234:TRP:CD1	2.46	0.51
1:A:2816:LEU:HD12	1:A:2817:PRO:HD2	1.93	0.51
1:A:3124:ASP:OD1	1:A:3125:TYR:N	2.43	0.51
1:A:4496:ALA:HB2	1:A:4504:LEU:HD11	1.92	0.51
1:A:1961:ASN:OD1	1:A:2025:ARG:HD2	2.11	0.51
1:A:3212:VAL:HA	1:A:3215:VAL:HG22	1.93	0.51
1:A:2138:ILE:HD11	1:A:2165:PHE:HB2	1.93	0.50
1:A:2596:PRO:HB2	1:A:2738:TYR:CZ	2.46	0.50
1:A:2834:GLN:NE2	1:A:2847:ASP:OD1	2.45	0.50
1:A:4160:THR:HG23	1:A:4212:LEU:HD21	1.94	0.50
1:A:4398:LEU:HB2	1:A:4414:GLU:OE1	2.11	0.50
1:A:3972:TYR:OH	1:A:3976:GLU:OE2	2.29	0.50
1:A:2925:ILE:HG21	1:A:2933:LEU:HG	1.93	0.50
1:A:4469:VAL:HG13	1:A:4473:MET:HE3	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2885:ASP:OD1	1:A:2886:GLN:N	2.41	0.50
1:A:2909:LEU:HA	2:A:4704:ADP:C2	2.46	0.50
1:A:1887:ARG:NH2	1:A:4253:GLY:O	2.45	0.50
1:A:4043:MET:HE3	1:A:4051:ALA:HB1	1.92	0.50
1:A:2980:LEU:HB3	1:A:3054:PHE:HZ	1.77	0.50
1:A:3630:GLY:O	1:A:3674:SER:OG	2.28	0.50
1:A:1576:LEU:O	1:A:1579:MET:HG3	2.12	0.50
1:A:4394:THR:O	1:A:4490:GLN:NE2	2.45	0.50
1:A:4374:PRO:HG2	1:A:4377:MET:HG3	1.93	0.49
1:A:1543:ARG:HB3	1:A:1608:LEU:HD13	1.94	0.49
1:A:3584:ASN:O	1:A:3651:ARG:NH2	2.44	0.49
1:A:3723:ASP:OD1	1:A:3724:VAL:N	2.45	0.49
1:A:2142:CYS:O	1:A:2146:VAL:HB	2.13	0.49
1:A:2457:SER:O	1:A:2461:MET:HG3	2.12	0.49
1:A:2590:PRO:O	1:A:2732:PRO:HD2	2.13	0.49
1:A:2995:ASP:OD2	1:A:3067:THR:OG1	2.30	0.49
1:A:1734:ASP:HB3	1:A:1737:THR:HG22	1.94	0.49
1:A:2047:GLN:HA	1:A:2070:VAL:HG21	1.93	0.49
1:A:2211:TYR:HB2	1:A:2237:LEU:HD11	1.93	0.49
1:A:3200:HIS:HD2	1:A:3754:ASN:ND2	2.10	0.49
1:A:3830:GLN:NE2	1:A:3834:ASP:OD1	2.44	0.49
1:A:3927:LEU:HD11	1:A:3957:PHE:HE2	1.78	0.49
1:A:2387:LEU:N	1:A:2416:GLN:OE1	2.42	0.49
1:A:3078:ARG:HA	1:A:3081:THR:HG22	1.94	0.49
1:A:2784:PHE:HB2	1:A:2794:TYR:HE2	1.77	0.49
1:A:1547:LEU:HD12	1:A:1608:LEU:HD22	1.95	0.49
1:A:2943:LYS:HG2	1:A:3094:PHE:HD2	1.77	0.49
1:A:1991:ASP:O	1:A:1994:SER:OG	2.31	0.48
1:A:3157:ALA:HB1	1:A:3524:MET:HE2	1.94	0.48
1:A:3611:ARG:HG3	1:A:3634:LEU:HD23	1.94	0.48
1:A:2457:SER:OG	1:A:2732:PRO:HB3	2.12	0.48
1:A:2526:LEU:HD13	1:A:2534:ILE:HD11	1.95	0.48
1:A:2885:ASP:HB3	1:A:2888:GLU:OE1	2.14	0.48
1:A:1568:PHE:HB2	1:A:1611:ILE:HD13	1.95	0.48
1:A:3057:GLN:OE1	1:A:3060:ARG:NH2	2.43	0.48
1:A:2464:GLN:NE2	1:A:2468:ASN:OD1	2.46	0.48
1:A:2666:ILE:HG22	1:A:2712:CYS:HB3	1.95	0.48
1:A:2285:ARG:NH1	1:A:2331:GLU:OE2	2.34	0.48
1:A:2896:ARG:HG3	1:A:2953:MET:HE3	1.96	0.48
1:A:2622:PHE:HB2	1:A:2665:GLU:O	2.13	0.47
1:A:3654:ARG:HG3	1:A:3661:LEU:HB2	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4543:VAL:HG21	1:A:4622:VAL:HB	1.95	0.47
1:A:1727:PHE:HE1	1:A:1737:THR:HG23	1.79	0.47
1:A:2131:LEU:HD12	1:A:2132:PRO:HD2	1.95	0.47
1:A:3470:ALA:HA	1:A:3473:ASN:ND2	2.29	0.47
1:A:3759:ARG:NH2	1:A:3762:ASP:OD1	2.47	0.47
1:A:1882:THR:HA	1:A:2048:LEU:HD23	1.96	0.47
1:A:2855:LEU:HD22	1:A:2867:MET:HE1	1.96	0.47
1:A:3971:PRO:HB2	1:A:3973:LEU:HG	1.96	0.47
1:A:4157:MET:HE2	1:A:4157:MET:HB3	1.83	0.47
1:A:2184:LYS:O	1:A:2188:GLU:HG2	2.15	0.47
1:A:2517:TYR:CE2	1:A:2521:ILE:HD13	2.50	0.47
1:A:2590:PRO:HB2	1:A:2731:VAL:HG12	1.95	0.47
1:A:3154:LEU:HG	1:A:3516:TYR:CD1	2.50	0.47
1:A:3559:ARG:O	1:A:3563:GLN:HG2	2.14	0.47
1:A:1580:LYS:O	1:A:1584:LYS:HG2	2.15	0.47
1:A:1880:VAL:HG21	1:A:2049:ILE:HA	1.96	0.47
1:A:3716:VAL:HB	1:A:3836:TYR:OH	2.15	0.47
1:A:3756:VAL:HG12	1:A:3758:GLY:H	1.80	0.47
1:A:2018:MET:O	1:A:2020:PRO:HD3	2.15	0.47
1:A:3923:ARG:HH22	1:A:3929:VAL:HG22	1.80	0.47
1:A:2356:VAL:HG13	1:A:2361:MET:HE3	1.97	0.46
1:A:2581:LEU:HD12	1:A:2604:THR:HG22	1.96	0.46
1:A:4297:PRO:HG3	1:A:4308:TRP:CD2	2.50	0.46
1:A:2022[A]:TYR:HB2	1:A:2025:ARG:HG3	1.96	0.46
1:A:2148:LYS:HB3	1:A:2361:MET:HB2	1.98	0.46
1:A:3902:ASP:O	1:A:3906:GLN:HG2	2.15	0.46
1:A:2087:ASP:O	1:A:2148:LYS:NZ	2.48	0.46
1:A:2974:GLU:OE1	1:A:2977:ARG:NH1	2.48	0.46
1:A:1711:VAL:O	1:A:1715:LYS:HG2	2.16	0.46
1:A:1850:GLN:HB3	1:A:1856:GLN:HG2	1.97	0.46
1:A:2967:TYR:OH	1:A:2975:ASP:OD2	2.32	0.46
1:A:3021:PHE:CG	1:A:3029:LEU:HD22	2.51	0.46
1:A:3030:MET:HE3	1:A:3047:HIS:HB3	1.97	0.46
1:A:4039:THR:HG23	1:A:4142:GLY:HA2	1.97	0.46
1:A:2232:MET:HG3	3:A:4702:ATP:C8	2.51	0.46
1:A:2102:ASN:O	1:A:2106:GLU:HG2	2.15	0.46
1:A:3046:SER:OG	1:A:3049:GLU:OE1	2.24	0.46
1:A:2174:GLU:O	1:A:2174:GLU:HG2	2.15	0.46
1:A:2802:TRP:CZ2	1:A:2829:ALA:HB2	2.51	0.46
1:A:3849:VAL:HG12	1:A:3855:ARG:HG3	1.97	0.46
1:A:2277:ASP:OD2	1:A:2285:ARG:NE	2.44	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2956:LEU:HD22	1:A:2989:LYS:HB3	1.99	0.45
1:A:2962:LYS:HG3	1:A:3665:GLY:HA2	1.97	0.45
1:A:4376:TRP:HA	1:A:4379:THR:HG22	1.98	0.45
1:A:2070:VAL:HB	1:A:2071:PRO:HD3	1.98	0.45
1:A:1626:PHE:HB3	1:A:1629:PHE:CD2	2.52	0.45
1:A:2487:GLU:O	1:A:2491:GLN:HG3	2.16	0.45
1:A:3931:GLN:O	1:A:3935:VAL:HG23	2.17	0.45
1:A:4036:LYS:HD3	1:A:4036:LYS:HA	1.69	0.45
1:A:1961:ASN:ND2	1:A:2025:ARG:HB3	2.32	0.45
1:A:2465:ALA:HB2	1:A:2493:TYR:CD1	2.52	0.45
1:A:2492:ARG:HG2	1:A:2545:TRP:NE1	2.32	0.45
1:A:3207:LYS:HB3	1:A:3207:LYS:HZ3	1.82	0.45
1:A:3520:PHE:CD1	1:A:3524:MET:HG2	2.52	0.45
1:A:4179:LEU:HD12	1:A:4223:LEU:HD22	1.98	0.45
1:A:4505:LYS:HD3	1:A:4505:LYS:C	2.42	0.45
1:A:4517:PRO:HG2	1:A:4619:ILE:HD12	1.99	0.45
1:A:1878:LYS:HB3	1:A:1878:LYS:HE2	1.76	0.44
1:A:2373:MET:HB3	3:A:4702:ATP:C2	2.52	0.44
1:A:3825:TYR:CZ	1:A:3875:MET:HG2	2.52	0.44
1:A:1883:PRO:HD2	1:A:2045:ASP:OD2	2.17	0.44
1:A:2484:GLU:HG3	1:A:2485:GLN:N	2.32	0.44
1:A:3100:GLU:HG2	1:A:3130:TYR:CE1	2.47	0.44
1:A:1643:ASN:ND2	1:A:1649:LYS:HD2	2.32	0.44
1:A:3001:ASP:OD1	1:A:3002:SER:N	2.51	0.44
1:A:1972:SER:HB3	1:A:2032:LEU:HB2	1.99	0.44
1:A:3218:LEU:HD23	1:A:3218:LEU:HA	1.84	0.44
1:A:3935:VAL:HG22	1:A:3996:PHE:HE2	1.82	0.44
1:A:4068:SER:HB3	1:A:4097:LYS:HE3	1.98	0.44
1:A:4154:LYS:HD2	1:A:4312:LEU:HB2	1.99	0.44
1:A:3476:THR:O	1:A:3480:LYS:HG2	2.17	0.44
1:A:3649:LEU:HB3	1:A:3695:ARG:HB3	1.99	0.44
1:A:2769:LEU:O	1:A:2773:MET:HG3	2.18	0.44
1:A:2795:SER:HB2	1:A:2796:PRO:HD2	1.99	0.44
1:A:3096:ASP:OD1	1:A:3097:TRP:N	2.51	0.44
1:A:3779:GLU:O	1:A:3782:ARG:HG2	2.18	0.44
1:A:1960:PHE:HB3	1:A:2018:MET:HE2	2.00	0.44
1:A:2946:LEU:O	1:A:2950:VAL:HG23	2.18	0.44
1:A:3116:GLU:OE1	1:A:3140:ARG:NH2	2.51	0.44
1:A:4260:PHE:CE2	1:A:4608:PRO:HB3	2.52	0.44
1:A:1640:ILE:HD11	1:A:1653:HIS:HB3	2.00	0.44
1:A:1700:GLU:O	1:A:1704:LEU:HD23	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2022[B]:TYR:HB3	1:A:2025:ARG:HG3	1.99	0.44
1:A:2943:LYS:HE2	1:A:3067:THR:HB	2.00	0.44
1:A:3194:LEU:HD12	1:A:3197:GLN:NE2	2.32	0.44
1:A:2132:PRO:HB2	1:A:2135:GLU:HG2	1.98	0.43
1:A:2561:LYS:HB3	1:A:2567:VAL:HG21	1.99	0.43
1:A:2773:MET:HG2	1:A:2825:TRP:HE1	1.82	0.43
1:A:3876:LEU:HD23	1:A:4146:VAL:HG11	2.00	0.43
1:A:4288:VAL:HG11	1:A:4294:ILE:HG13	2.00	0.43
1:A:2564:ALA:HB3	1:A:2567:VAL:HG23	2.00	0.43
1:A:2601:LYS:HG2	1:A:2736:VAL:HB	1.99	0.43
1:A:3636:GLN:HA	1:A:3680:SER:OG	2.18	0.43
1:A:3756:VAL:HG11	1:A:3760:ILE:HG12	2.00	0.43
1:A:4423:LEU:HD22	1:A:4466:HIS:HB2	2.00	0.43
1:A:1547:LEU:HD23	1:A:1547:LEU:HA	1.89	0.43
1:A:3495:THR:O	1:A:3499:GLN:NE2	2.51	0.43
1:A:2224:GLY:O	1:A:2346:GLN:HA	2.17	0.43
1:A:2879:LYS:HE3	1:A:2879:LYS:HB3	1.88	0.43
1:A:2760:PRO:HA	1:A:2763:ARG:HD3	2.01	0.43
1:A:3970:VAL:HB	1:A:3989:ARG:HD3	2.00	0.43
1:A:2446:ILE:HD12	1:A:2446:ILE:HA	1.92	0.43
1:A:2961:ILE:HD11	1:A:2998:ASN:HB3	2.00	0.43
1:A:1793:ALA:HA	1:A:1796:VAL:HG22	2.00	0.43
1:A:2110:LYS:HB3	1:A:2110:LYS:HE2	1.83	0.43
1:A:2919:VAL:HG23	1:A:2950:VAL:HG22	2.01	0.43
1:A:1645:LYS:HA	1:A:1645:LYS:HD3	1.85	0.43
1:A:2012:MET:HG2	1:A:2013:ALA:N	2.33	0.43
1:A:2265:TYR:O	1:A:2281:THR:OG1	2.35	0.43
1:A:4193:ARG:NH1	1:A:4321:LEU:O	2.51	0.43
1:A:4312:LEU:HD23	1:A:4312:LEU:HA	1.89	0.43
1:A:1960:PHE:HB3	1:A:2018:MET:CE	2.49	0.42
1:A:1969:SER:O	1:A:1972:SER:OG	2.29	0.42
1:A:3205:LEU:HA	1:A:3208:ILE:HG12	2.01	0.42
1:A:3206:ARG:O	1:A:3210:GLU:HG2	2.19	0.42
1:A:3470:ALA:HA	1:A:3473:ASN:HD21	1.84	0.42
1:A:1629:PHE:O	1:A:1632:VAL:HG12	2.19	0.42
1:A:1888:CYS:HA	1:A:2039:LEU:CD2	2.49	0.42
1:A:1959:GLU:HB3	1:A:1962:ARG:HG3	2.01	0.42
1:A:2091:ARG:HG2	2:A:4701:ADP:H4'	2.01	0.42
1:A:2449:LEU:HA	1:A:2453:ARG:NH2	2.34	0.42
1:A:3646:ASN:O	1:A:3650:ASN:ND2	2.52	0.42
1:A:4387:TRP:HZ2	1:A:4476:ILE:HG13	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1907:PRO:HA	1:A:2019:ASN:ND2	2.34	0.42
1:A:2324:LEU:HD21	1:A:2332:ARG:HB3	2.01	0.42
1:A:2415:ILE:HD11	1:A:2473:ASN:HD22	1.84	0.42
1:A:1606:ASP:O	1:A:1610:LYS:HG3	2.20	0.42
1:A:2697:ASP:OD1	1:A:2697:ASP:N	2.52	0.42
1:A:3161:LEU:HD11	1:A:3524:MET:SD	2.60	0.42
1:A:3211:THR:HG23	1:A:3761:LEU:HD11	2.00	0.42
1:A:4019:SER:O	1:A:4022:GLU:HG2	2.20	0.42
1:A:3548:ALA:HB3	1:A:3551:GLU:OE1	2.19	0.42
1:A:3875:MET:HE1	1:A:3883:PHE:HB2	2.01	0.42
1:A:2319:LEU:HD13	1:A:2359:CYS:SG	2.59	0.42
1:A:4178:ARG:HD3	1:A:4278:PHE:CD2	2.55	0.42
1:A:1859:ILE:HD11	1:A:1868:TYR:HD1	1.84	0.42
1:A:2019:ASN:HB3	1:A:2022[A]:TYR:CD2	2.54	0.42
1:A:2041:MET:HE2	1:A:2041:MET:HB3	1.89	0.42
1:A:2231:SER:HA	1:A:2234:TRP:NE1	2.35	0.42
1:A:2585:LEU:HG	1:A:2591:LEU:HD21	2.02	0.42
1:A:2930:GLN:HB2	1:A:3059:ILE:HG23	2.01	0.42
1:A:3933:GLU:HB3	1:A:3937:ARG:NH2	2.34	0.42
1:A:1546:TYR:HB2	1:A:1642:GLY:HA3	2.02	0.42
1:A:1561:LEU:HB3	1:A:1564:GLU:OE2	2.20	0.42
1:A:3873:ARG:HD3	1:A:3873:ARG:HA	1.77	0.42
1:A:2966:LYS:HE3	1:A:2966:LYS:HB3	1.79	0.41
1:A:4186:PHE:O	1:A:4190:ILE:HG12	2.20	0.41
1:A:4209:GLU:OE2	1:A:4213:ARG:NH1	2.53	0.41
1:A:1698:ILE:HA	1:A:1701:TRP:CD1	2.56	0.41
1:A:3570:ASP:OD1	1:A:3571:ASP:N	2.53	0.41
1:A:4246:LEU:HD23	1:A:4246:LEU:HA	1.82	0.41
1:A:2774:VAL:HG22	1:A:2799:MET:HE1	2.01	0.41
1:A:4131:ASN:ND2	1:A:4133:LYS:HE2	2.35	0.41
1:A:1814:GLU:HB2	1:A:1878:LYS:HZ3	1.85	0.41
1:A:2183:LYS:O	1:A:2187:GLN:HG2	2.20	0.41
1:A:3135:GLN:HB3	1:A:3136:PRO:HD3	2.02	0.41
1:A:2795:SER:HB2	1:A:2796:PRO:CD	2.51	0.41
1:A:3211:THR:O	1:A:3215:VAL:HG13	2.21	0.41
1:A:1631:PHE:CE2	1:A:1951:VAL:HG21	2.56	0.41
1:A:1961:ASN:CG	1:A:2025:ARG:HD2	2.46	0.41
1:A:3197:GLN:O	1:A:3201:LEU:HG	2.21	0.41
1:A:3624:GLU:OE2	1:A:3628:ARG:NH2	2.54	0.41
1:A:3650:ASN:HD21	1:A:3695:ARG:NH1	2.19	0.41
1:A:3929:VAL:HG12	1:A:3933:GLU:OE2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1735:PRO:O	1:A:1739:ILE:HG12	2.21	0.41
1:A:2175:MET:HE3	1:A:2208:LEU:HD22	2.01	0.41
1:A:3214:GLN:O	1:A:3217:GLU:HG2	2.21	0.41
1:A:3468:VAL:O	1:A:3472:VAL:HG23	2.20	0.41
1:A:3555:ASN:OD1	1:A:3558:GLU:HG2	2.21	0.41
1:A:3716:VAL:HG21	1:A:3804:LEU:HD23	2.01	0.41
1:A:3916:LEU:HD12	1:A:3937:ARG:HH21	1.86	0.41
1:A:3946:ASP:O	1:A:3950:LYS:HD2	2.21	0.41
1:A:4409:LEU:HD11	1:A:4558:PHE:HE2	1.86	0.41
1:A:2461:MET:HE2	1:A:2461:MET:HB3	1.92	0.41
1:A:3026:TYR:CZ	1:A:3030:MET:HE2	2.56	0.41
1:A:3186:LEU:HD13	1:A:3510:SER:HB2	2.03	0.41
1:A:3718:LYS:HB3	1:A:3718:LYS:HE2	1.95	0.41
1:A:4237:LYS:HA	1:A:4237:LYS:HD3	1.87	0.41
1:A:4293:ASP:OD1	1:A:4293:ASP:N	2.54	0.41
1:A:2936:ILE:HD12	1:A:3091:LEU:HD21	2.03	0.40
1:A:3148:VAL:O	1:A:3152:GLN:HG3	2.21	0.40
1:A:3923:ARG:HA	1:A:3923:ARG:HD3	1.83	0.40
1:A:4412:PHE:CZ	1:A:4520:TYR:HB2	2.56	0.40
1:A:2505:ASP:OD1	1:A:2505:ASP:N	2.52	0.40
1:A:3143:ILE:HD13	1:A:3541:ILE:HD13	2.03	0.40
1:A:3846:LEU:HD22	1:A:3855:ARG:HG2	2.03	0.40
1:A:1713:LEU:HD23	1:A:1713:LEU:HA	1.95	0.40
1:A:2066:ALA:HA	1:A:2069:ILE:HG22	2.03	0.40
1:A:3956:GLN:HA	1:A:3959:ILE:HD12	2.03	0.40
1:A:4288:VAL:HA	1:A:4319:SER:OG	2.21	0.40
1:A:2245:GLU:OE1	1:A:2298:ARG:NH2	2.40	0.40
1:A:2308:ASP:O	1:A:2312:VAL:HG12	2.22	0.40
1:A:2437:LEU:HD21	1:A:2451:ARG:HG3	2.03	0.40
1:A:3491:LYS:HD3	1:A:3491:LYS:HA	1.81	0.40
1:A:4190:ILE:HG23	1:A:4201:TRP:HZ2	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2852/4646 (61%)	2806 (98%)	46 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	2533/4125 (61%)	2533 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1569	GLN
1	A	1939	GLN
1	A	1950	GLN
1	A	2263	HIS
1	A	2485	GLN
1	A	2588	HIS
1	A	2637	HIS
1	A	2677	GLN
1	A	2827	HIS
1	A	3522	GLN
1	A	3526	GLN
1	A	3537	GLN
1	A	3754	ASN
1	A	3820	GLN
1	A	3985	GLN
1	A	4429	GLN
1	A	4490	GLN
1	A	4544	ASN
1	A	4566	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
2	ADP	A	4704	-	24,29,29	0.74	0	29,45,45	0.72	1 (3%)
3	ATP	A	4702	4	28,33,33	0.75	0	34,52,52	0.80	1 (2%)
2	ADP	A	4701	-	24,29,29	0.74	0	29,45,45	0.72	1 (3%)
2	ADP	A	4703	-	24,29,29	0.75	0	29,45,45	0.73	1 (3%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ADP	A	4704	-	-	0/12/32/32	0/3/3/3
3	ATP	A	4702	4	-	1/18/38/38	0/3/3/3
2	ADP	A	4701	-	-	0/12/32/32	0/3/3/3
2	ADP	A	4703	-	-	0/12/32/32	0/3/3/3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	4702	ATP	C5-C6-N6	2.33	123.86	120.31
2	A	4704	ADP	C5-C6-N6	2.30	123.81	120.31
2	A	4703	ADP	C5-C6-N6	2.25	123.74	120.31
2	A	4701	ADP	C5-C6-N6	2.22	123.70	120.31

There are no chirality outliers.

All (1) torsion outliers are listed below:

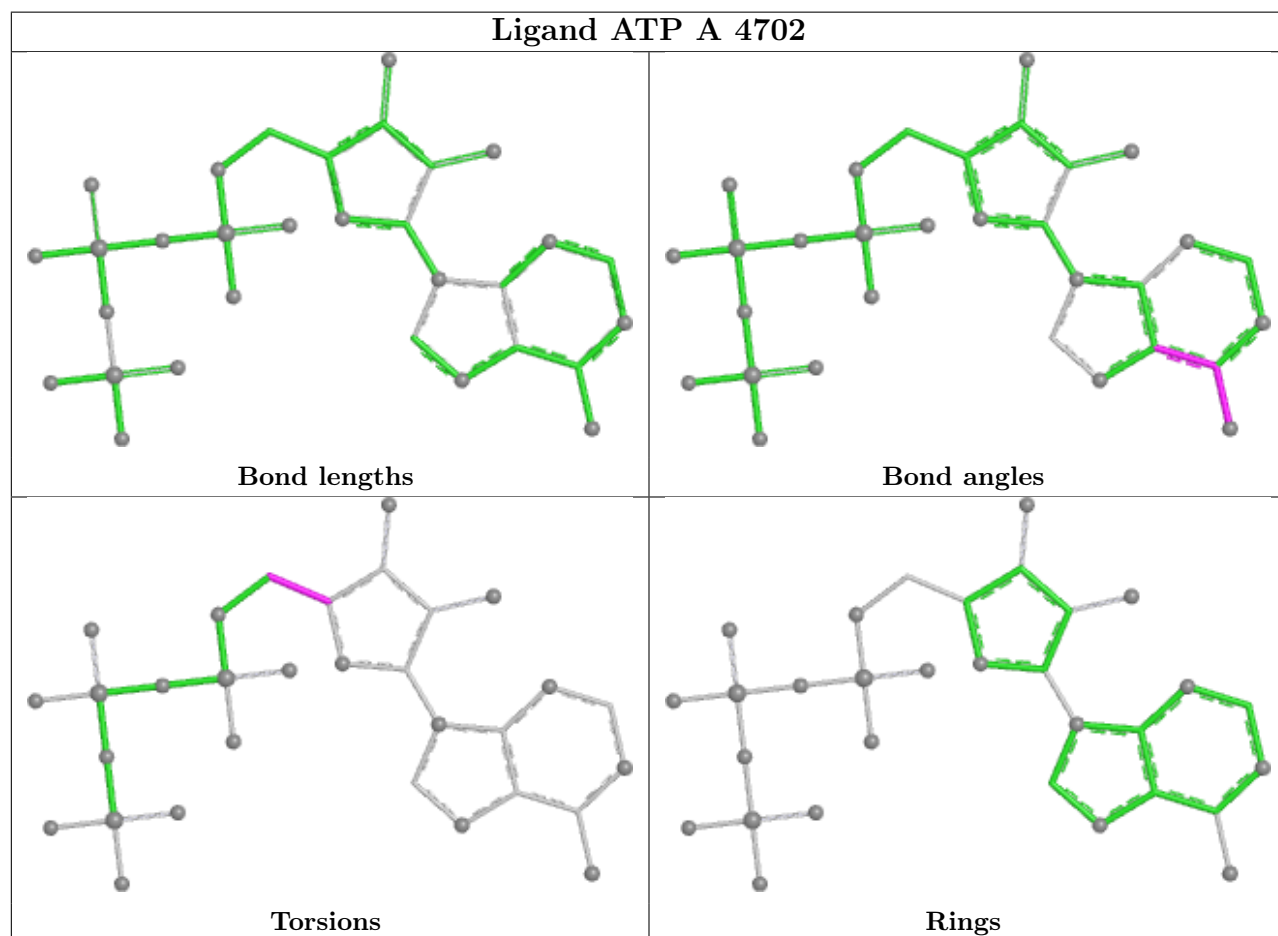
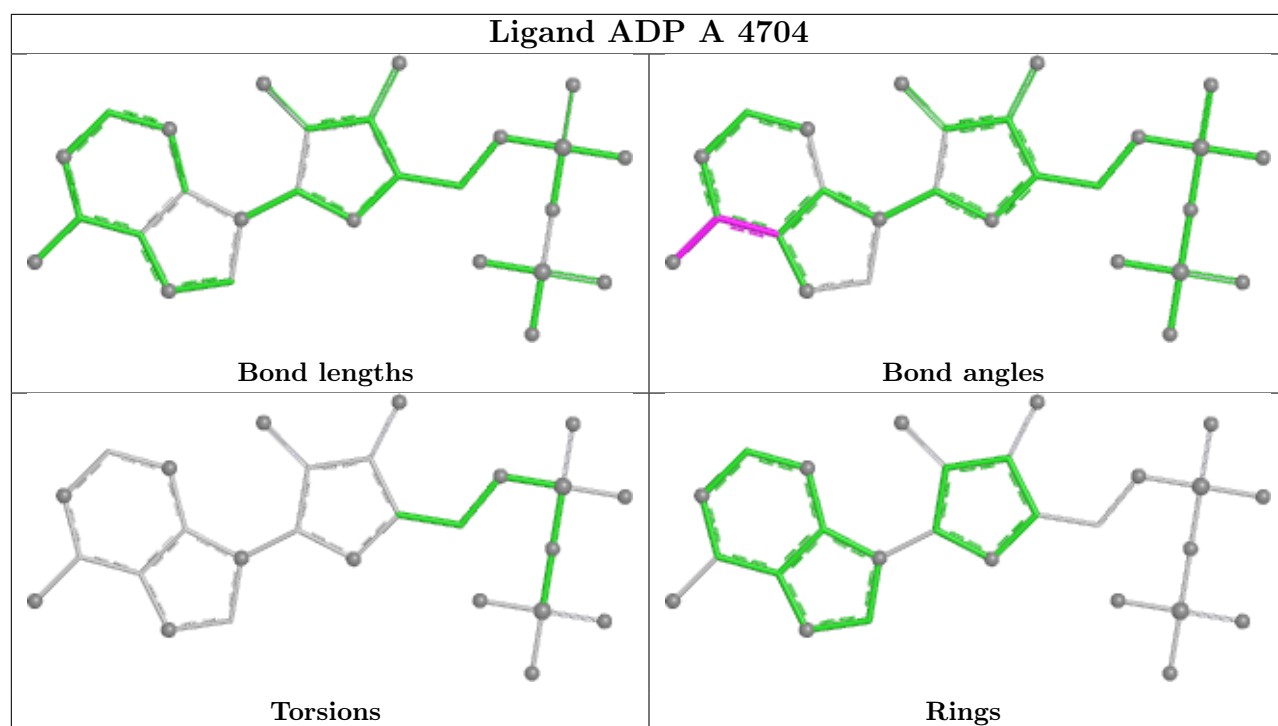
Mol	Chain	Res	Type	Atoms
3	A	4702	ATP	O4'-C4'-C5'-O5'

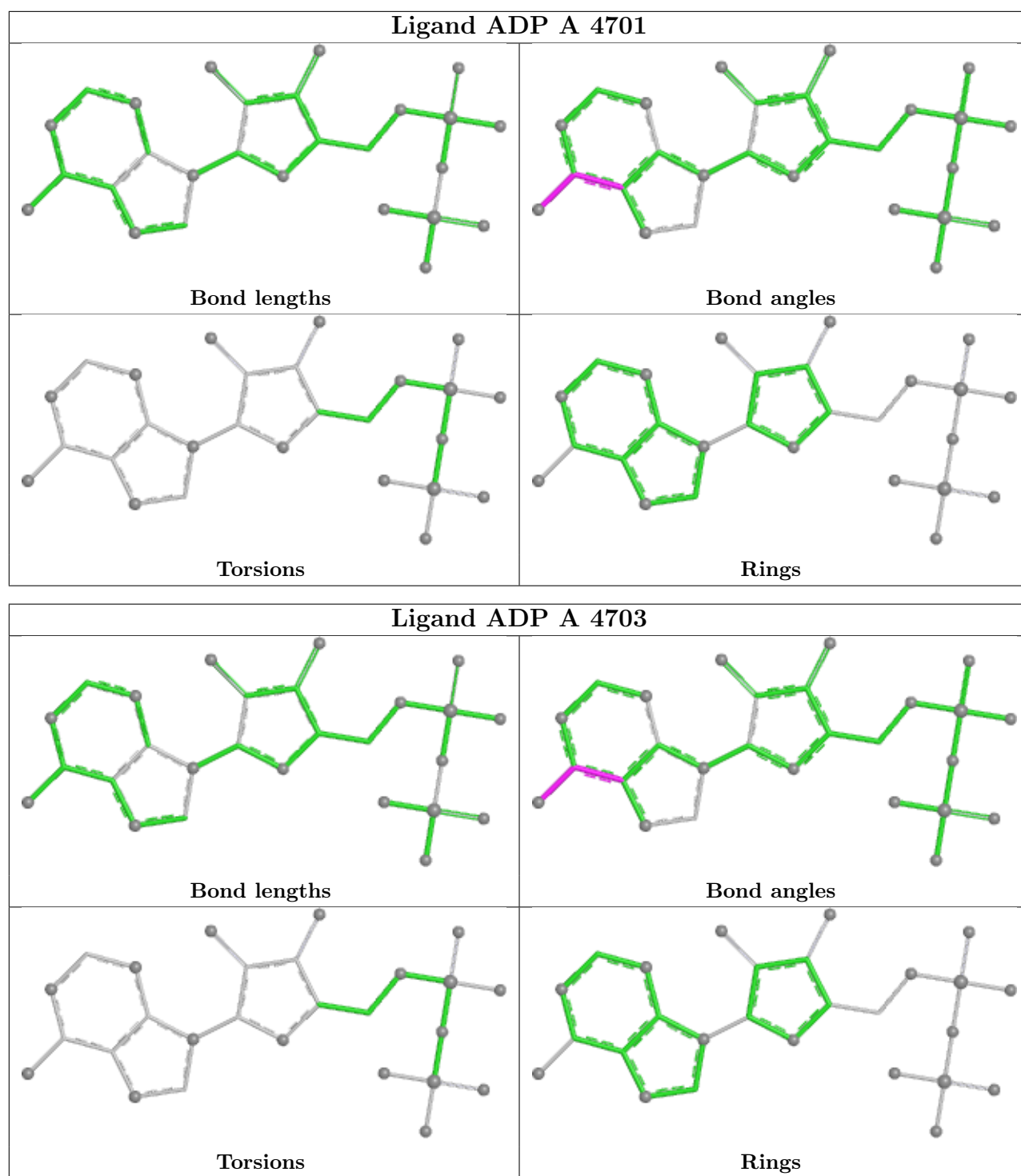
There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4704	ADP	1	0
3	A	4702	ATP	2	0
2	A	4701	ADP	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

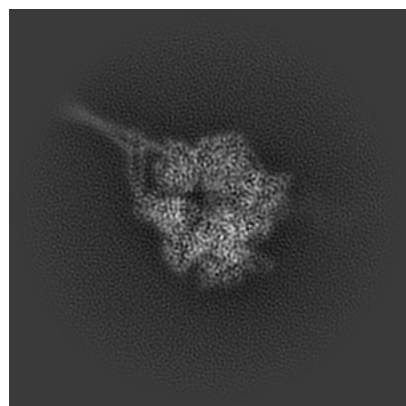
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44684. These allow visual inspection of the internal detail of the map and identification of artifacts.

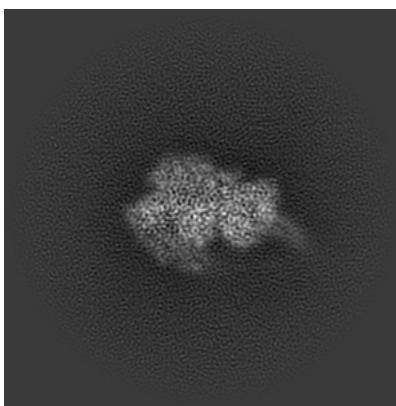
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

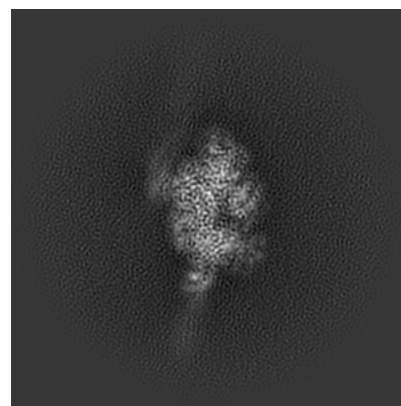
6.1.1 Primary map



X

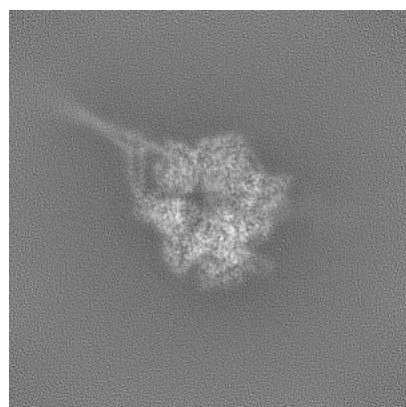


Y

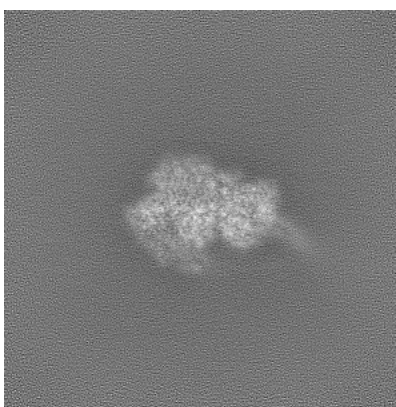


Z

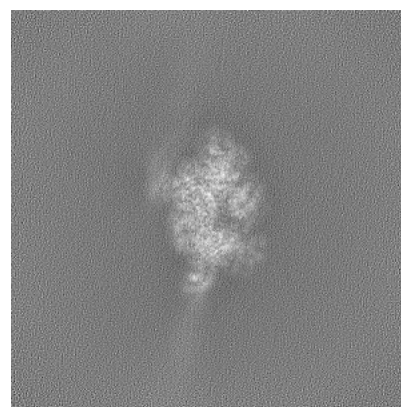
6.1.2 Raw map



X



Y

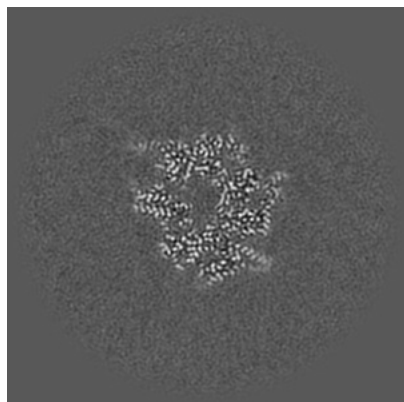


Z

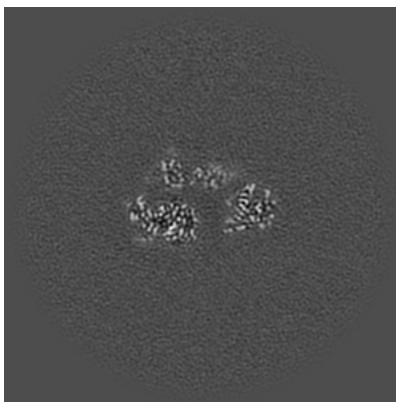
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

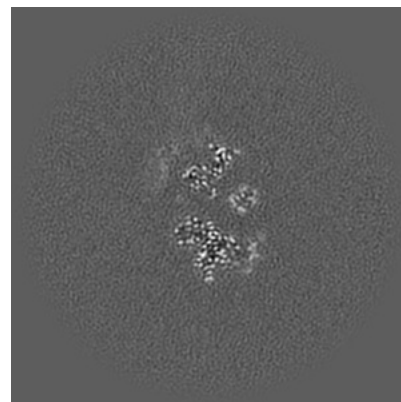
6.2.1 Primary map



X Index: 200

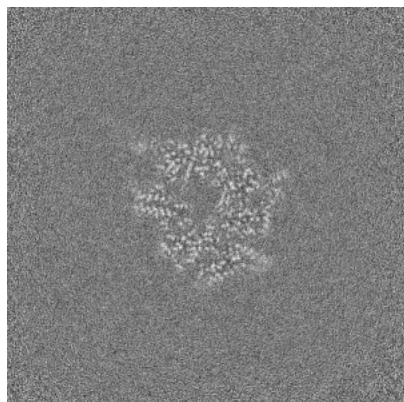


Y Index: 200

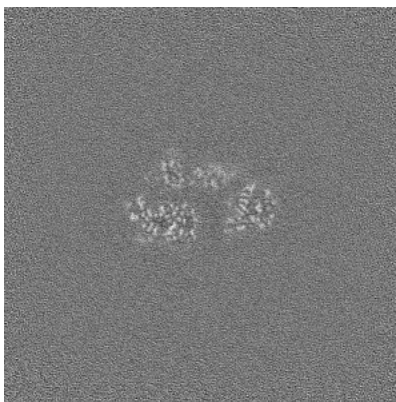


Z Index: 200

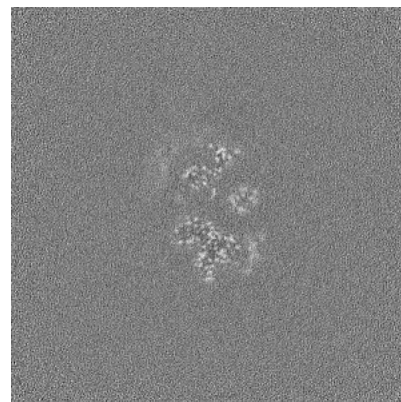
6.2.2 Raw map



X Index: 200



Y Index: 200

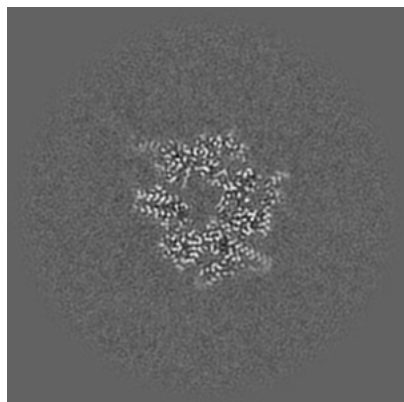


Z Index: 200

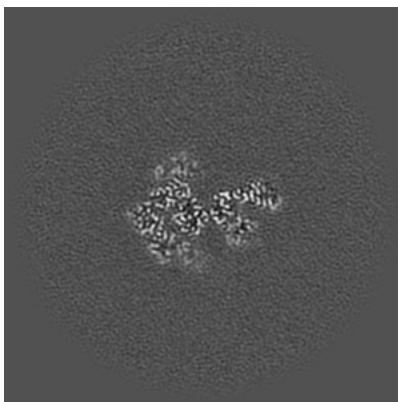
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

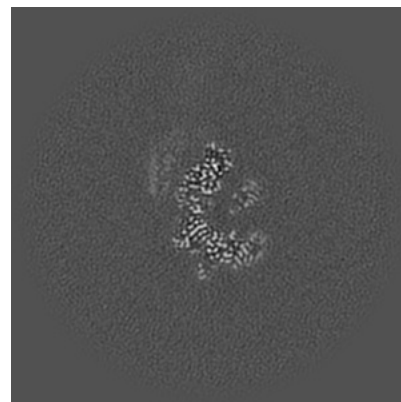
6.3.1 Primary map



X Index: 201

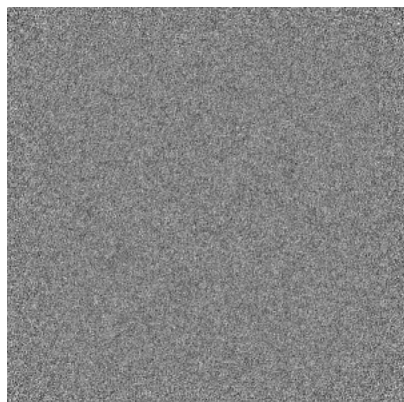


Y Index: 223

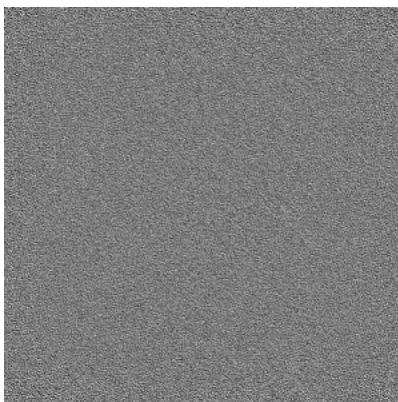


Z Index: 191

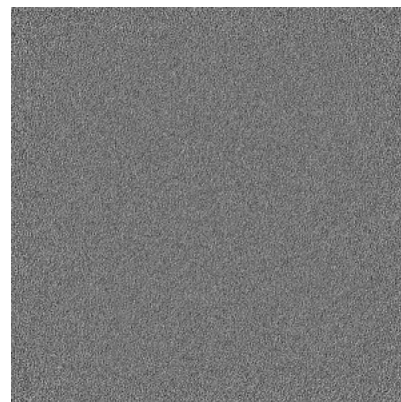
6.3.2 Raw map



X Index: 0



Y Index: 0

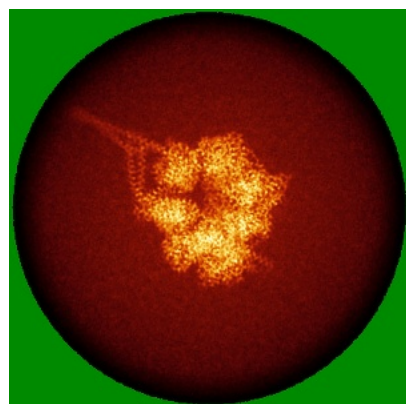


Z Index: 0

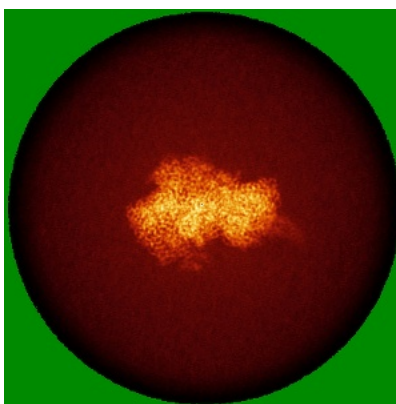
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

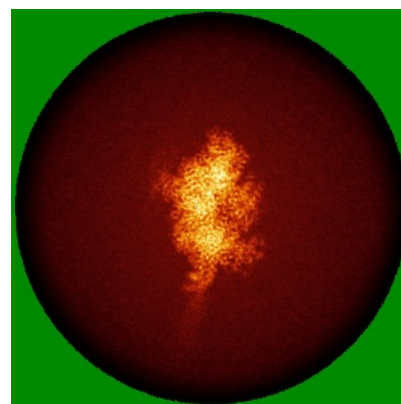
6.4.1 Primary map



X

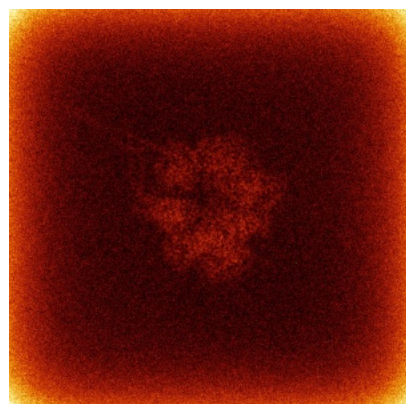


Y

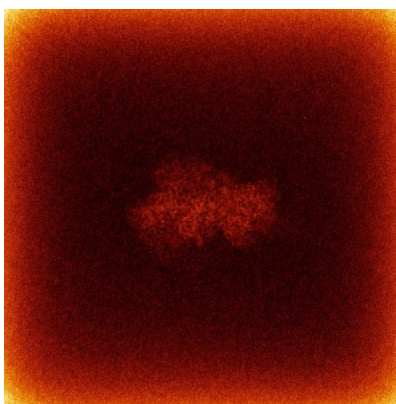


Z

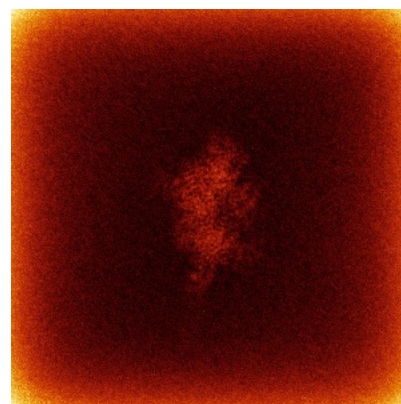
6.4.2 Raw map



X



Y

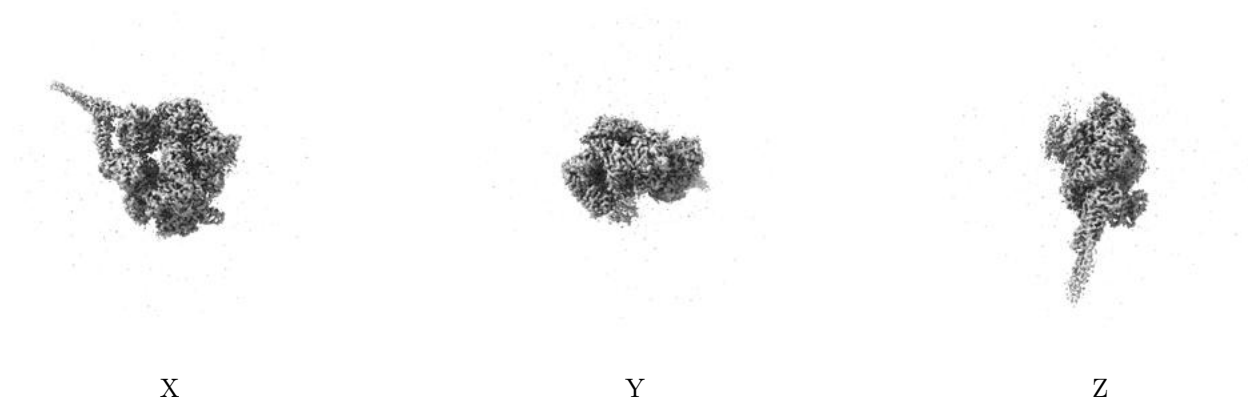


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

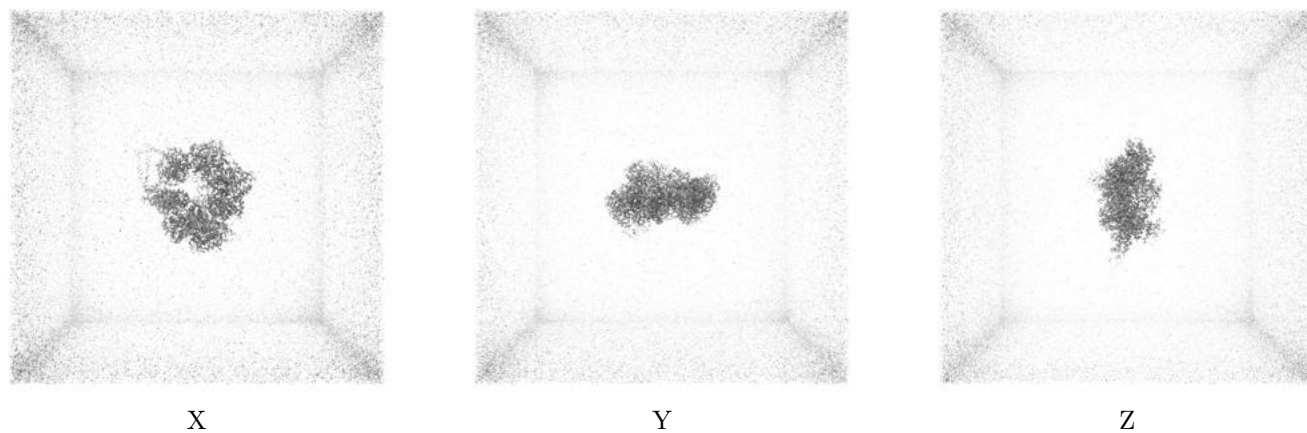
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.13. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

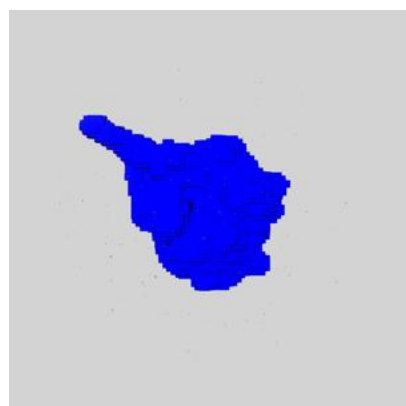
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

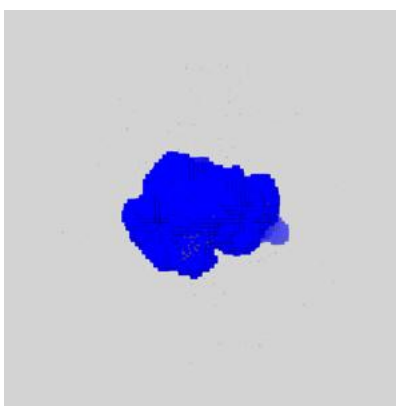
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

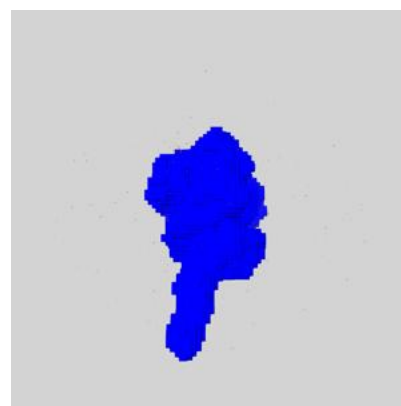
6.6.1 emd_44684_msk_1.map [i](#)



X



Y

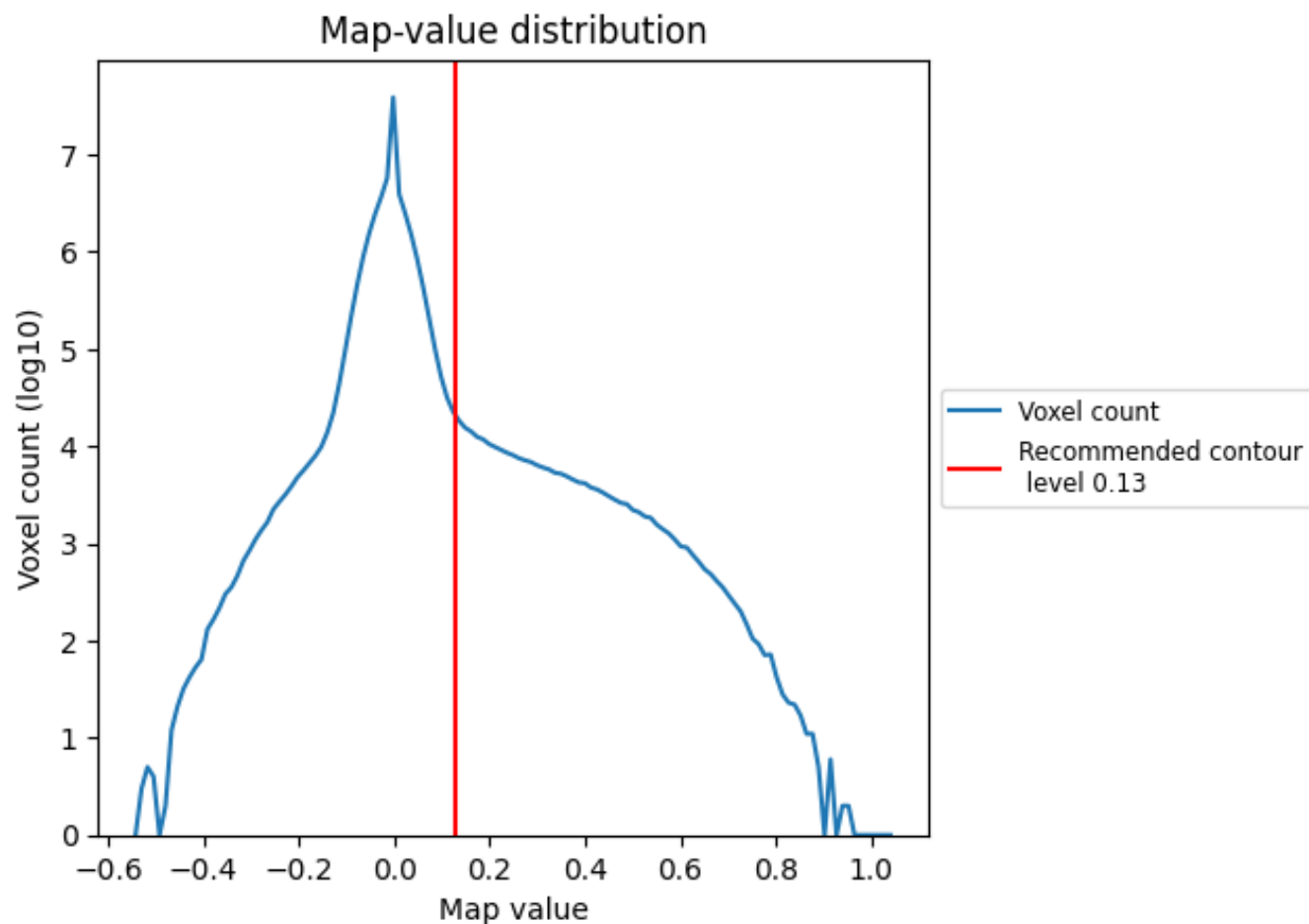


Z

7 Map analysis [i](#)

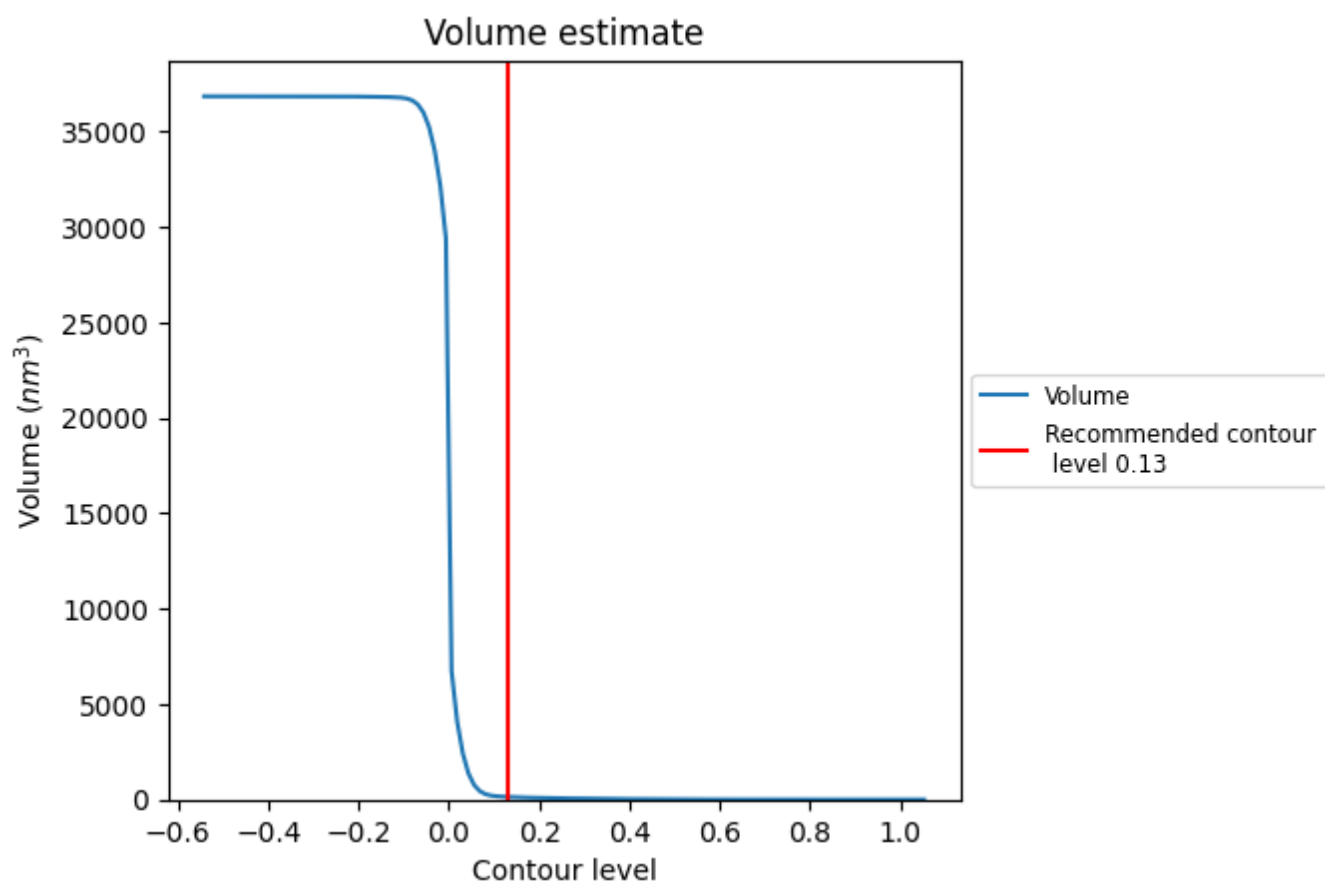
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

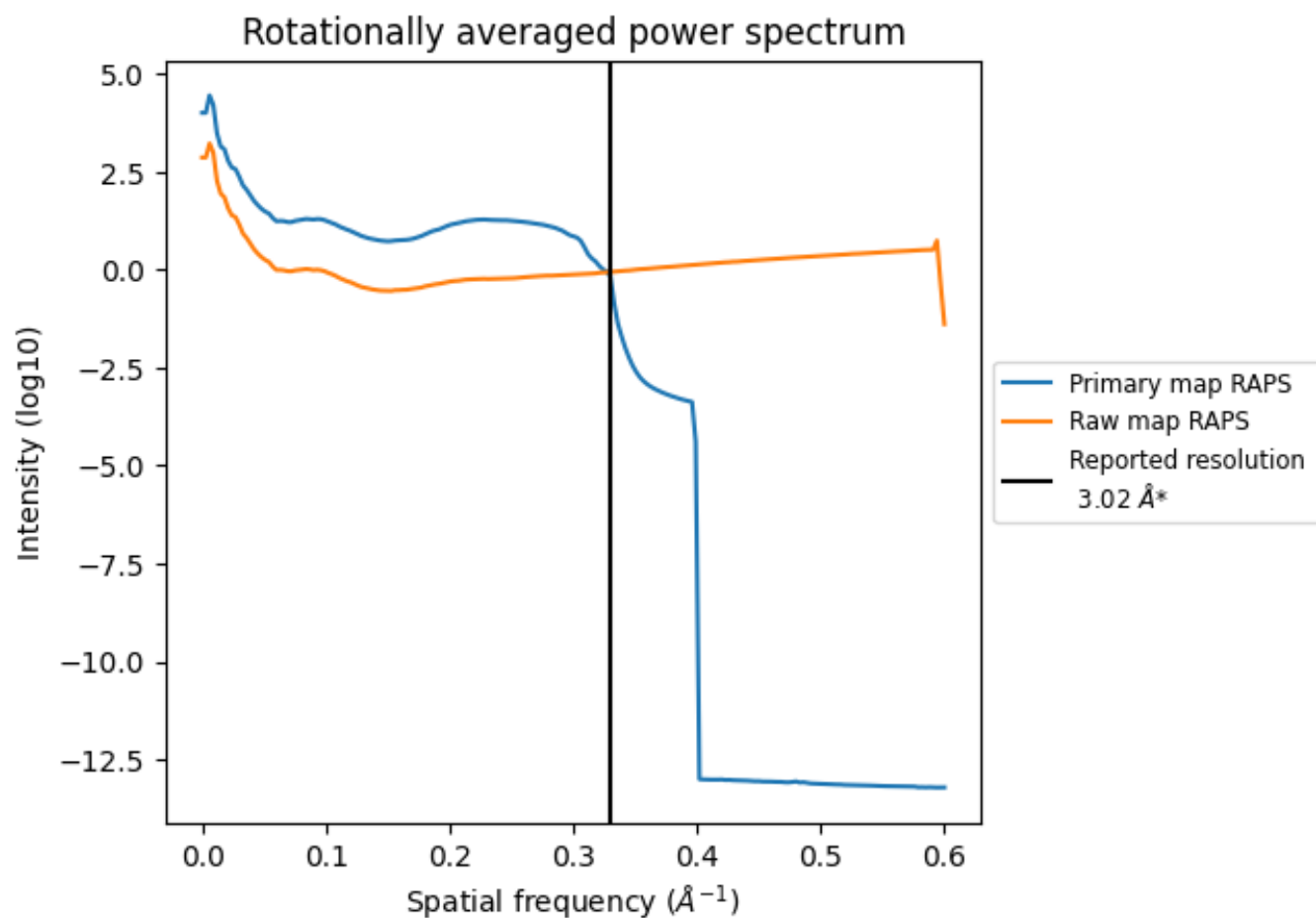
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 138 nm³; this corresponds to an approximate mass of 124 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

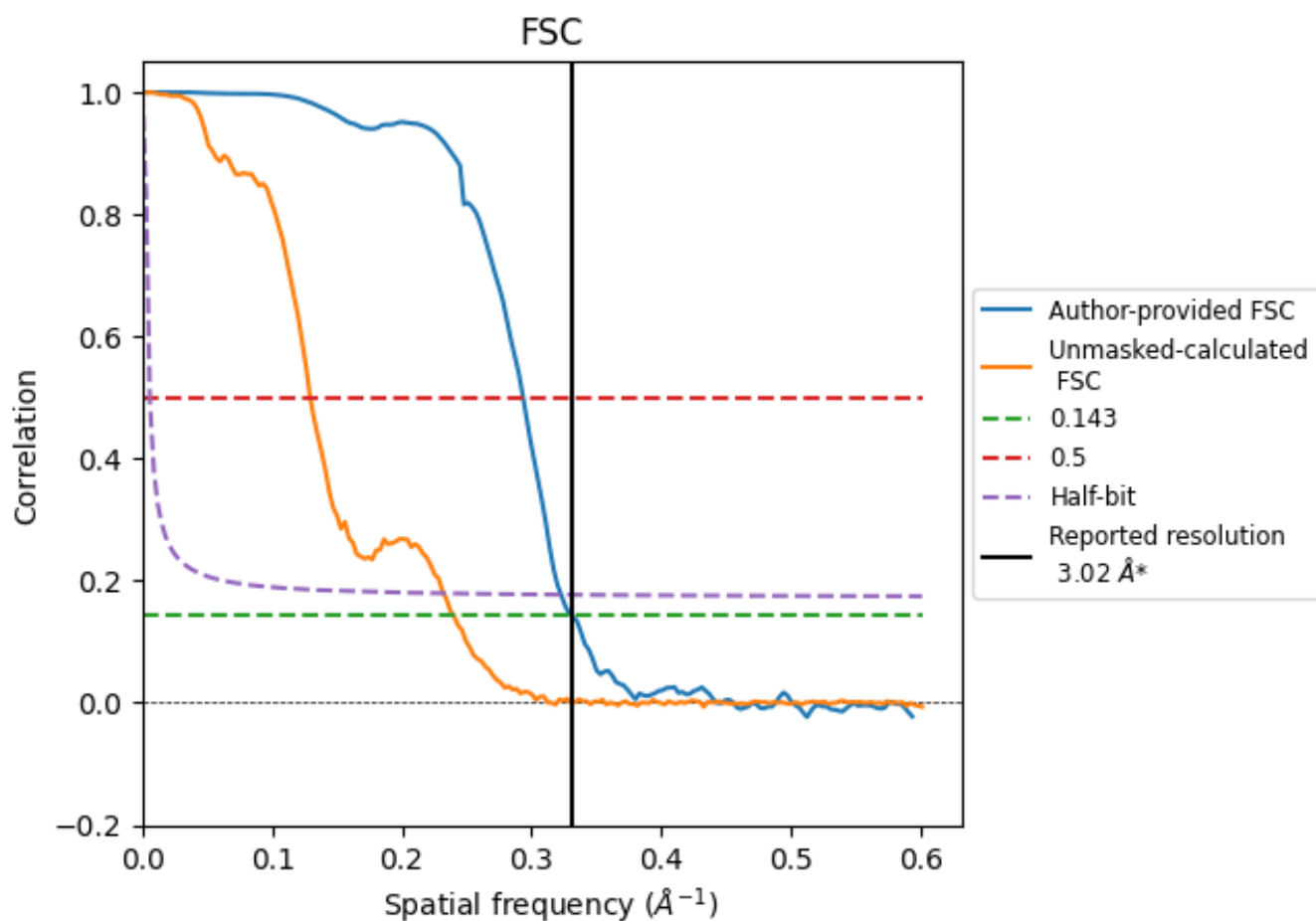


*Reported resolution corresponds to spatial frequency of 0.331 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.331 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

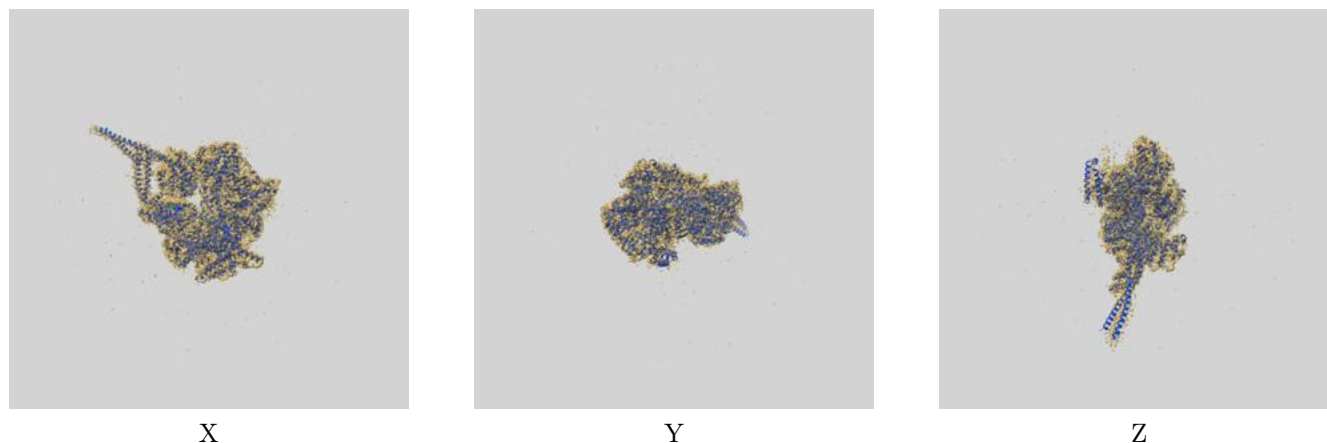
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.02	-	-
Author-provided FSC curve	3.02	3.41	3.10
Unmasked-calculated*	4.17	7.73	4.31

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.17 differs from the reported value 3.02 by more than 10 %

9 Map-model fit [i](#)

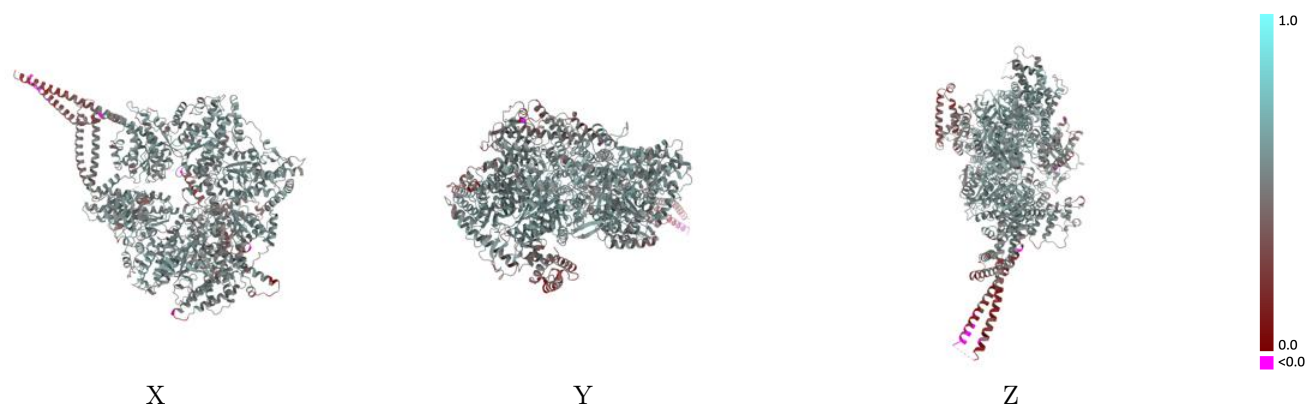
This section contains information regarding the fit between EMDB map EMD-44684 and PDB model 9BM1. Per-residue inclusion information can be found in section [3](#) on page [5](#).

9.1 Map-model overlay [i](#)



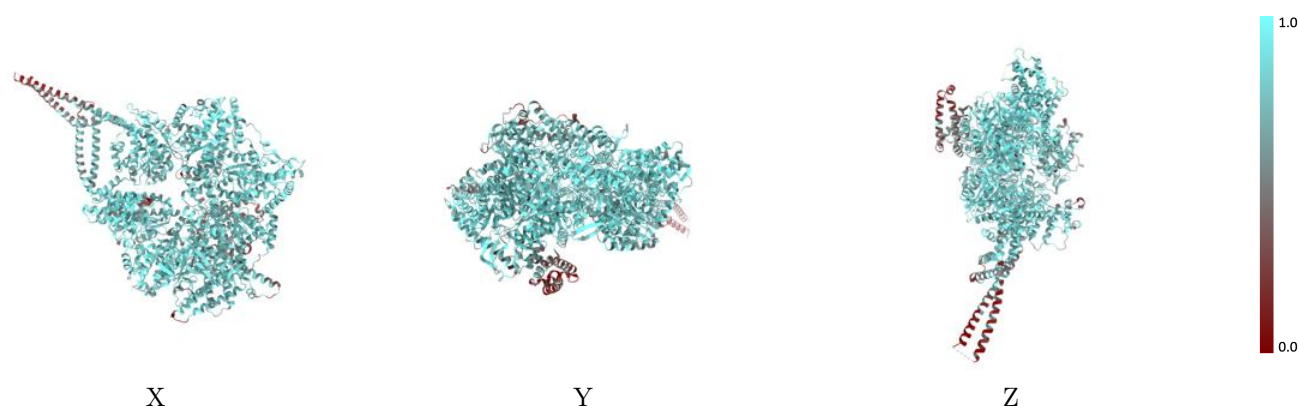
The images above show the 3D surface view of the map at the recommended contour level 0.13 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



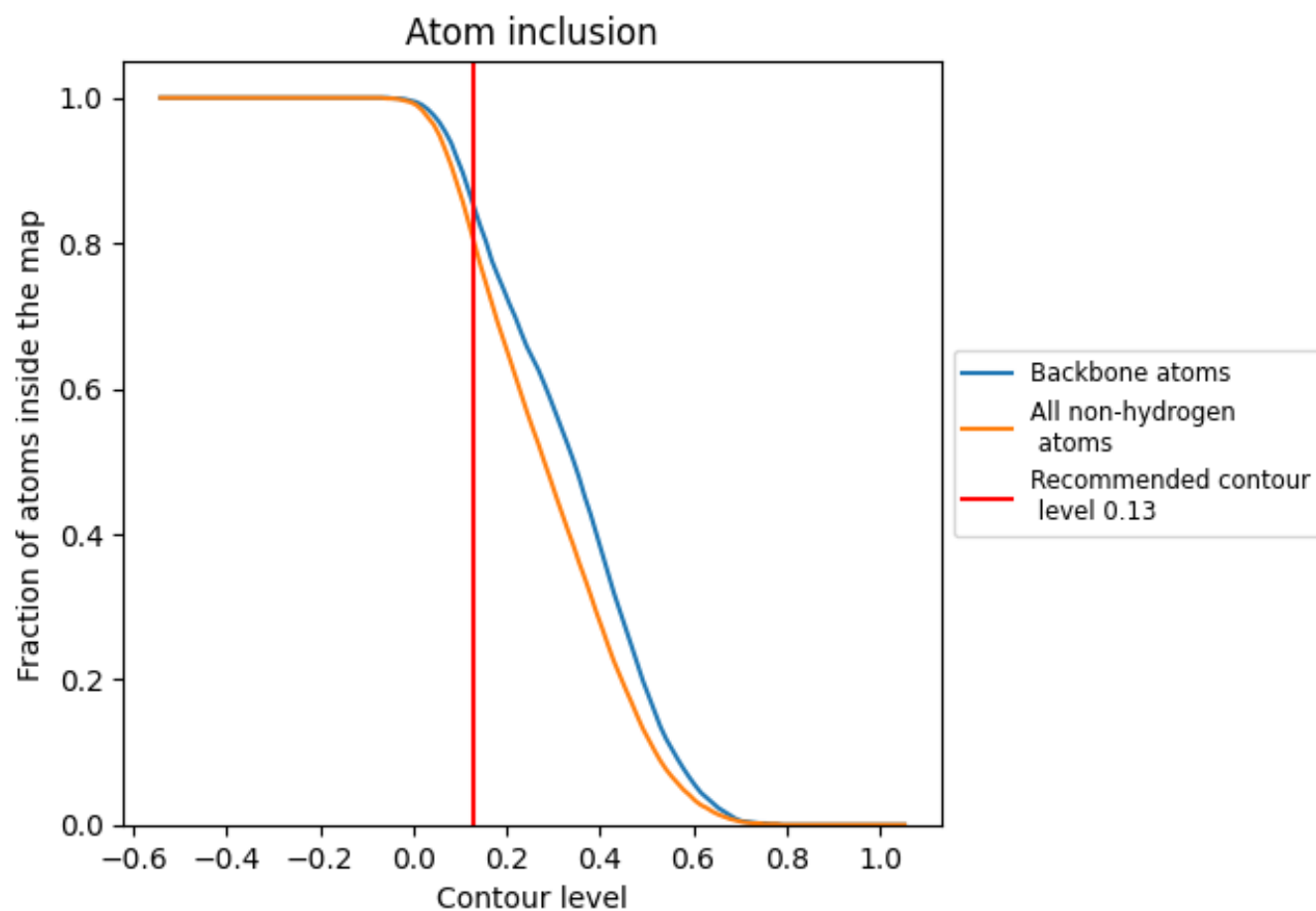
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.13).

9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 80% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.13) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8010	0.5150
A	0.8010	0.5150

