



# wwPDB EM Validation Summary Report ⓘ

May 26, 2025 – 04:11 PM EDT

PDB ID : 9BN1 / pdb\_00009bn1  
EMDB ID : EMD-44718  
Title : State-8 of motor domain from full-length human dynein-1 in apo condition  
Authors : Chai, P.; Zhang, K.  
Deposited on : 2024-05-02  
Resolution : 3.80 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

EMDB validation analysis : 0.0.1.dev118  
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) : 2.43.1

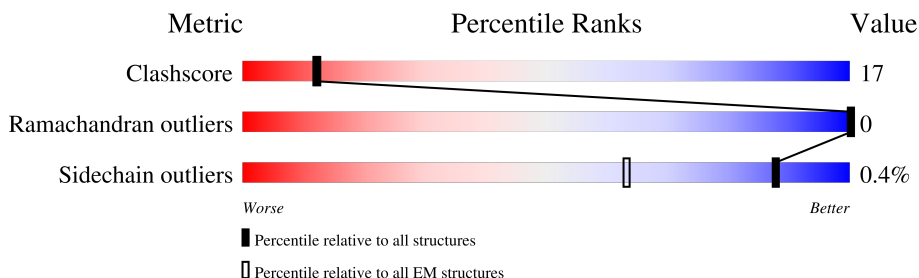
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.80 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  $\geq 3$ , 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	<div> <div>13%</div> <div>42%</div> <div>24%</div> <div>35%</div> </div>

## 2 Entry composition [i](#)

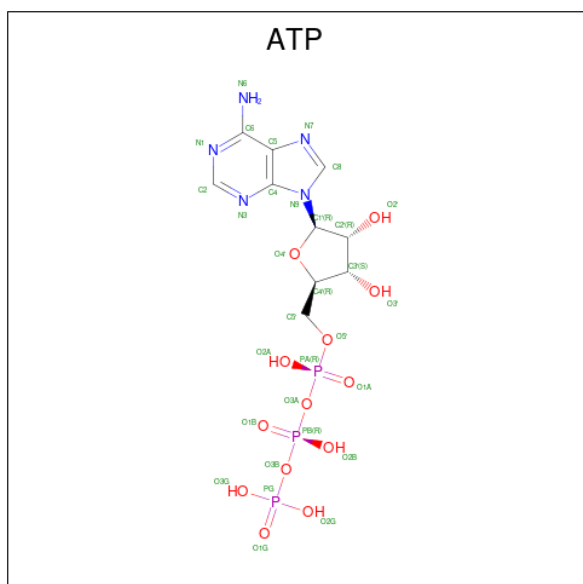
There are 4 unique types of molecules in this entry. The entry contains 24476 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

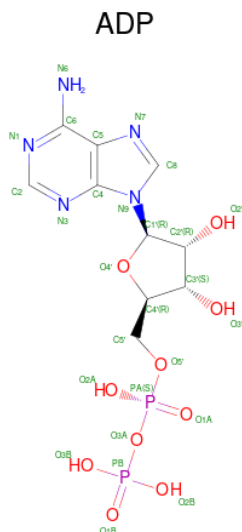
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	3029	24390	15542	4208	4518	122	0	0

- Molecule 2 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
			Total	C	N	O	P	
2	A	1	31	10	5	13	3	0

- Molecule 3 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
3	A	1	Total 27	C 10	N 5	O 10	P 2	0
3	A	1	Total 27	C 10	N 5	O 10	P 2	0

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

Mol	Chain	Residues	Atoms	AltConf
4	A	1	Total Mg 1 1	0

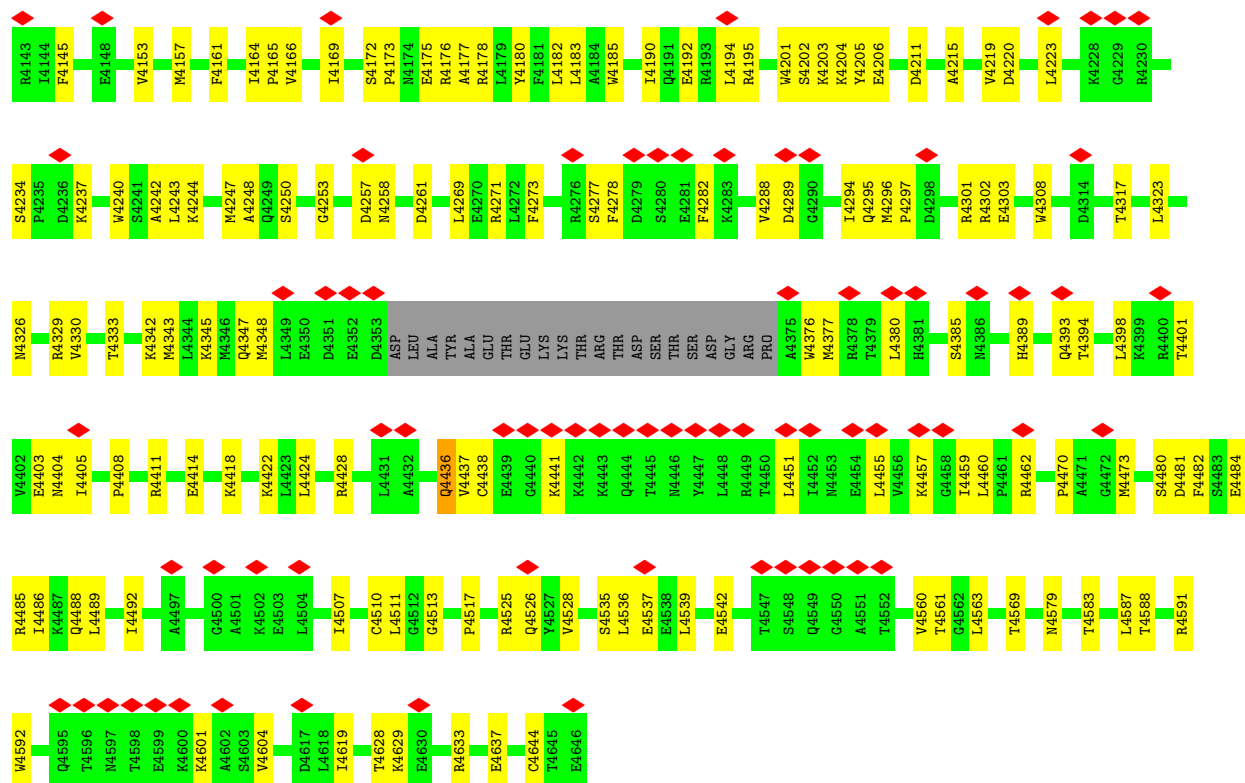




Q3057	M2953	V2853	F2652	L2577	Q2482	ARG	K2323	V2236	E2133	Y2055	S1986
V3065	V2958	L2855	C2663	E2578	L2483	LYS	L2324	L2237	Q2134	S2056	N1987
T3067	V2958	L2856	E2664	A2579	E2484	GLY	L2325	L2238	E2135	Q2057	P1988
N3068	L2961	H2857	I2665	L2580	Q2485	LYS	L2326	L2244	L2136	R2060	N1989
N3069	K2962	R2863	N2667	Y2682	Y2493	ASP	L2327	G2249	L2137	L2085	Y1990
V3070	V2963	E2864	T2683	T2583	L2494	GLU	P2328	K2257	E2143	T2069	D1991
S3071	H2964	R2869	K2671	L2498	I2498	GLU	N2329	K2261	E2144	V2070	K1992
S3072	R2965	L2871	K2673	L2499	L2499	GLU	G2330	K2261	M2145	P2071	T1993
G3073	G2969	L2872	G2675	L2591	W2500	GLU	E2331	K2261	Y2146	F2072	S1994
G3074	E2970	S2874	Q2676	P2596	S2503	GLU	R2332	T2267	P2147	L2075	A1995
N3078	V2979	K2879	Q2677	G2597	G2504	GLU	L2333	L2268	L2148	C2076	P1996
T3081	G2984	D2880	E2678	G2598	D2505	GLU	L2334	D2269	L2149	D2077	I1997
F3086	N2987	Y2881	V2679	T2597	L2506	GLU	S2335	N2271	E2152	E2078	E2000
F3094	F2992	L2882	I2680	G2598	L2508	GLU	L2336	M2271	V2164	Q2079	E2000
G3095	L2993	P2883	V2687	G2598	K2509	GLU	P2336	N2271	Q2169	L2080	L2001
N3096	M2994	R2889	Y2689	T2602	M2510	GLU	E2339	M2271	Y2170	F2088	L2002
D3096	D2995	L2890	R2694	M2603	M2511	GLU	R2340	N2271	Q2169	G2089	N2003
K3097	E2996	P2891	Q2698	F2606	R2512	GLU	L2341	N2271	Y2170	L2090	K2004
E3100	N2997	L2892	Q2698	L2609	E2513	GLU	E2344	D2277	M2175	L2090	Q2005
A3101	V2998	R2893	Q2698	D2614	E2513	GLU	Q2345	L2278	L2178	R2091	L2002
L3102	V2999	K2894	Q2698	M2615	E2514	GLU	Q2346	L2279	E2181	A2092	N2003
V3105	L3000	K2894	Q2698	V2617	L2517	GLU	D2347	L2280	C2186	S2095	K2004
G3106	D3001	L2898	Q2698	F2622	L2526	GLU	K2349	T2281	V2096	V2096	P2010
K3107	F3004	E2898	Q2698	S2623	L2527	GLU	T2352	R2285	L2097	V2096	A2013
T3110	F3006	E2902	Q2698	S2624	T2528	GLU	A2354	S2290	Y2190	V2098	N2019
S3111	E3006	L2903	Q2698	E2629	N2531	GLU	R2358	V2291	L2191	G2101	P2020
K3112	L3010	L2905	Q2698	L2632	D2536	GLU	C2359	R2292	E2197	K2104	G2021
N3113	L3011	L2906	Q2698	L2633	T2537	GLU	W2363	G2293	M2202	R2107	TYR
L3115	L3012	D2906	Q2698	T2634	I2541	GLU	F2364	L2295	W2203	L2108	ALA
E3116	V3017	V2907	Q2698	F2635	W2545	GLU	S2365	Q2296	K2206	Q2109	GLY
K3117	L3017	L2910	Q2698	D2636	W2545	GLU	E2366	K2297	V2207	K2110	ARG
P3118	G3023	L2916	Q2698	R2642	W2548	GLU	M2373	Q2298	L2208	R2113	S2026
N3119	D3024	L2920	Q2698	R2643	W2548	GLU	L2374	Q2299	Q2209	L2028	N2027
V3120	C3033	L2927	Q2698	T2644	Q2554	GLU	F2375	W2300	L2210	P2029	D2030
K3125	K3034	R2937	Q2698	G2647	Q2554	GLU	N2376	L2301	T2214	E2116	N2031
F3127	E3040	L2934	Q2698	L2650	E2558	GLU	F2377	F2303	H2218	R2117	L2032
V3128	G3041	L2935	Q2698	T2559	T2559	GLU	L2379	D2304	G2219	G2118	K2033
V3129	L3042	L2936	Q2698	H2560	H2560	GLU	G2382	G2305	M2222	G2119	F2036
D3130	M3043	L2937	Q2698	K2561	K2561	GLU	L2383	D2306	V2223	E2120	R2037
D3131	L3044	G2940	Q2698	V2569	V2569	GLU	P2386	V2307	G2224	A2121	S2038
K3132	G2942	L2941	Q2698	T2570	T2570	GLU	E2389	D2308	G2224	V2122	L2039
L3133	D3045	K2943	Q2698	L2572	L2572	GLU	E2389	P2309	G2224	D2123	K2040
P3134	E3046	L2946	Q2698	T2574	T2574	GLU	E2389	E2310	G2229	K2041	N2041
Q3135	E3049	S2947	Q2698	T2575	T2575	GLU	E2389	E2311	G2229	T2042	T2042
H3139	W3053	R2948	Q2698	V2576	V2576	GLU	E2389	E2312	S2231	G2125	K2043
F3140	F3054	L2948	Q2698	L2576	L2576	GLU	E2389	E2313	S2231	E2126	P2044
E3141			Q2698	V2576	V2576	GLU	E2389	E2314	A2233	I2127	D2045
A3142			Q2698	L2576	L2576	GLU	E2389	E2315	R2234	L2127	R2046
			Q2698	L2576	L2576	GLU	E2389	E2316	R2234	N2130	Q2047
			Q2698	L2576	L2576	GLU	E2389	E2317	R2234	L2131	L2048
			Q2698	L2576	L2576	GLU	E2389	E2318	R2234	L2132	A2049
			Q2698	L2576	L2576	GLU	E2389	E2319	R2234	L2133	Q2050
			Q2698	L2576	L2576	GLU	E2389	E2320	R2234	L2134	Q2051
			Q2698	L2576	L2576	GLU	E2389	E2321	R2234	L2135	M2052
			Q2698	L2576	L2576	GLU	E2389	E2322	R2234	L2136	M2053
			Q2698	L2576	L2576	GLU	E2389	E2323	R2234	L2137	L2054

F4077	N4078	Q4079	A4080	N4081	K4082	A4083	T4084	N4085	T4086	A4087	V4088	K4089	S4090	G4091	R4092	V4093	V4094	M4095	L4096	K4097	N4098	N4099	H4100	L4101	A4102	F4103	Q4104	W4105	L4106	N4107	Q4108	L4109	E4110	K4111	K4112	L4113	L4116	Q4117	P4118	H4119	A4120	C4121	F4122	R4123	L4124	T4127	N4128	E4129	K4133	V4134	L4138	L4139	R4140	A4141	G4142						
R3989	L3990	L3991	L3992	A4003	M4004	A4005	H4006	M4007	F4008	L4013	G4014	A4015	S4016	F4017	M4018	M4021	E4022	Q4023	P4024	L4025	D4026	L4027	L4028	H4029	I4030	E4034	M4038	L4042	D4050	A4051	S4052	G4053	H4054	D4057	L4058	A4059	A4060	E4061	M4063	I4066	T4067	S4068	I4071	G4072	S4073	A4074	E4075	G4076													
T3765	I3766	I3767	T3768	T3769	R3770	E3771	N3772	L3773	K3774	R3775	E3776	A3777	R3778	E3779	V3780	T3781	R3782	K3783	V3784	E3785	E3786	T3787	K3788	L3789	V3790	M3791	D3792	I3793	F3794	E3795	T3796	V3797	Q3800	Y3801	L3804	A3807	S3810	I3811	Y3812	T3814	M3815	K3819	Y3825	Q3826	T3827	S3828	L3829	Q3830	F3831	I3835	Y3836										
H3837	N3838	V3839	E3842	N3845	L3846	K3847	G3848	D3851	H3852	T3853	Q3854	R3855	L3856	I3859	T3860	K3861	D3862	V3866	R3870	V3871	A3872	K3873	G3874	M3875	D3879	K3880	I3881	T3882	F3883	K3885	L3886	L3887	A3888	R3889	K3890	K3891	L3892	K3893	T3900	Y3901	D3902	A3903	Q3906	H3907	R3910	G3911	N3912	E3913	A3980	I3983	G3984	Q3985	A3986	I3987	H3988						
I3914	V3915	L3916	S3917	A3918	G3919	S3920	T3921	P3922	R3923	I3924	Q3925	G3926	L3927	E3930	E3933	V3936	R3937	L3938	S3939	C3940	F3944	K3945	L3946	L3947	I3948	A3949	K3950	V3951	Q3952	A3953	D3954	E3955	Q3956	F3957	G3958	I3959	E3967	V3970	L3973	V3974	S3975	E3976	E3977	A3980	I3983	G3984	Q3985	A3986	I3987	H3988											
ALA	VAL	GLU	A3470	K3471	F3472	N3473	R3474	S3475	T3476	A3477	L3478	L3479	K3480	L3481	S3482	S3483	A3484	E3485	R3486	E3487	F3488	E3489	E3490	K3491	T3492	S3493	E3494	T3495	F3496	K3497	N3498	Q3499	I3503	A3504	G3505	L3509	S3510	A3511	I3514	A3517	G3518	Y3519	F3520	D3521	M3524	W3532	L3536	Q3537	N3540	I3541	Q3542										
LYS	ARG	GLU	GLY	LEU	ARG	ASN	ALA	LEU	GLN	LYS	LEU	GLU	ASP	ALA	LYS	ASN	GLN	LYS	ASN	TYR	MET	ASN	PRO	ASN	ALA	TYR	ASN	TYR	ASN	ILE	ARG	ALA	SER	LEU	CYS	GLY	GLY	PRO	MET	THR	VAL	LYS	TRP	ALA	LYS	GLN	ILE	ALA	GLN	ARG	LEU	ILE	ASN	TYR	ALA	ALA	ASP	ARG	ASP	LEU	ALA
PHE	ILE	PRO	THR	ILE	VAL	ASN	PHE	SER	ALA	GLU	LEU	GLN	GLY	ARG	LYS	LYS	MET	LYS	ASN	TYR	MET	ASN	PRO	ASN	ALA	TYR	ASN	TYR	ASN	ILE	ARG	ALA	SER	LEU	CYS	GLY	GLY	PRO	MET	THR	VAL	LYS	TRP	ALA	LYS	GLN	ILE	ALA	GLN	ARG	LEU	ILE	ASN	TYR	ALA	ALA	ASP	ARG	ASP	LEU	ALA
GLN	GLU	LEU	VAL	VAL	LYS	ASN	ALA	VAL	ASN	ASP	LYS	LYS	LEU	LEU	LEU	ASP	ASN	GLN	LYS	ARG	GLN	GLN	LYS	VAL	GLY	VAL	GLN	LYS	VAL	LYS	GLN	GLY	GLY	VAL	ILE	ILE	ASP	THR	ASP	ASP	LYS	GLN	MET	SER	SER	VAL	VAL	GLY	ILE	ALA	GLN	ARG	LEU	ILE	ASN	TYR	ALA	ALA			





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	50945	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	45000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.817	Depositor
Minimum map value	-0.311	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.2	Depositor
Map size (Å)	333.312, 333.312, 333.312	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.302, 1.302, 1.302	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

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	0.18	0/24908	0.40	1/33751 (0.0%)

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	1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1862	ALA	CB-CA-C	-5.13	110.68	116.63

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1603	ARG	Sidechain

### 5.2 Too-close contacts [i](#)

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	24390	0	24462	826	0
2	A	31	0	12	4	0
3	A	54	0	24	7	0
4	A	1	0	0	0	0
All	All	24476	0	24498	826	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 17.

The worst 5 of 826 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:1457:MET:HE1	1:A:3659:ARG:HA	1.41	1.03
1:A:2444:GLU:H	1:A:2510:MET:HE1	1.33	0.92
1:A:2667:ASN:HD22	1:A:2712:CYS:HB2	1.35	0.91
1:A:1550:ILE:HG23	1:A:1638:LEU:HD21	1.51	0.90
1:A:3206:ARG:HH12	1:A:3209:LYS:HD3	1.35	0.89

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	3019/4646 (65%)	2946 (98%)	73 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	2696/4125 (65%)	2686 (100%)	10 (0%)	89 91

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4127	THR
1	A	4161	PHE
1	A	4436	GLN
1	A	2787	ASP
1	A	3572	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 26 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2960	GLN
1	A	3555	ASN
1	A	4526	GLN
1	A	3198	GLN
1	A	3584	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 1 is monoatomic - leaving 3 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	ATP	A	4701	4	28,33,33	0.88	1 (3%)	34,52,52	0.65	1 (2%)
3	ADP	A	4702	-	24,29,29	0.86	0	29,45,45	1.27	2 (6%)
3	ADP	A	4703	-	24,29,29	0.85	0	29,45,45	1.19	2 (6%)

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	ATP	A	4701	4	-	4/18/38/38	0/3/3/3
3	ADP	A	4702	-	-	0/12/32/32	0/3/3/3
3	ADP	A	4703	-	-	3/12/32/32	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	4701	ATP	PA-O3A	-2.70	1.56	1.59

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	4702	ADP	N3-C2-N1	-3.75	123.58	128.67
3	A	4703	ADP	N3-C2-N1	-3.64	123.73	128.67
3	A	4703	ADP	C4-C5-N7	-2.56	106.63	109.34
3	A	4702	ADP	C4-C5-N7	-2.32	106.88	109.34
2	A	4701	ATP	C5-C6-N6	2.28	123.78	120.31

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	4701	ATP	O4'-C4'-C5'-O5'

*Continued on next page...*

*Continued from previous page...*

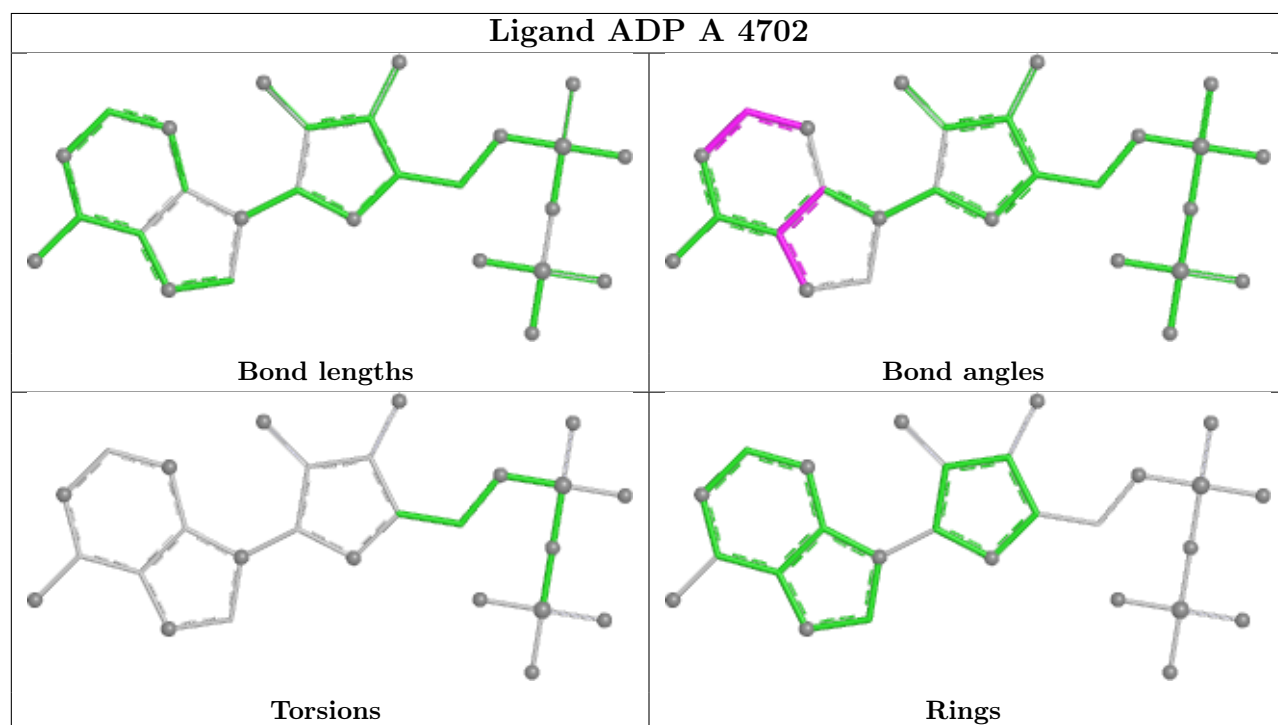
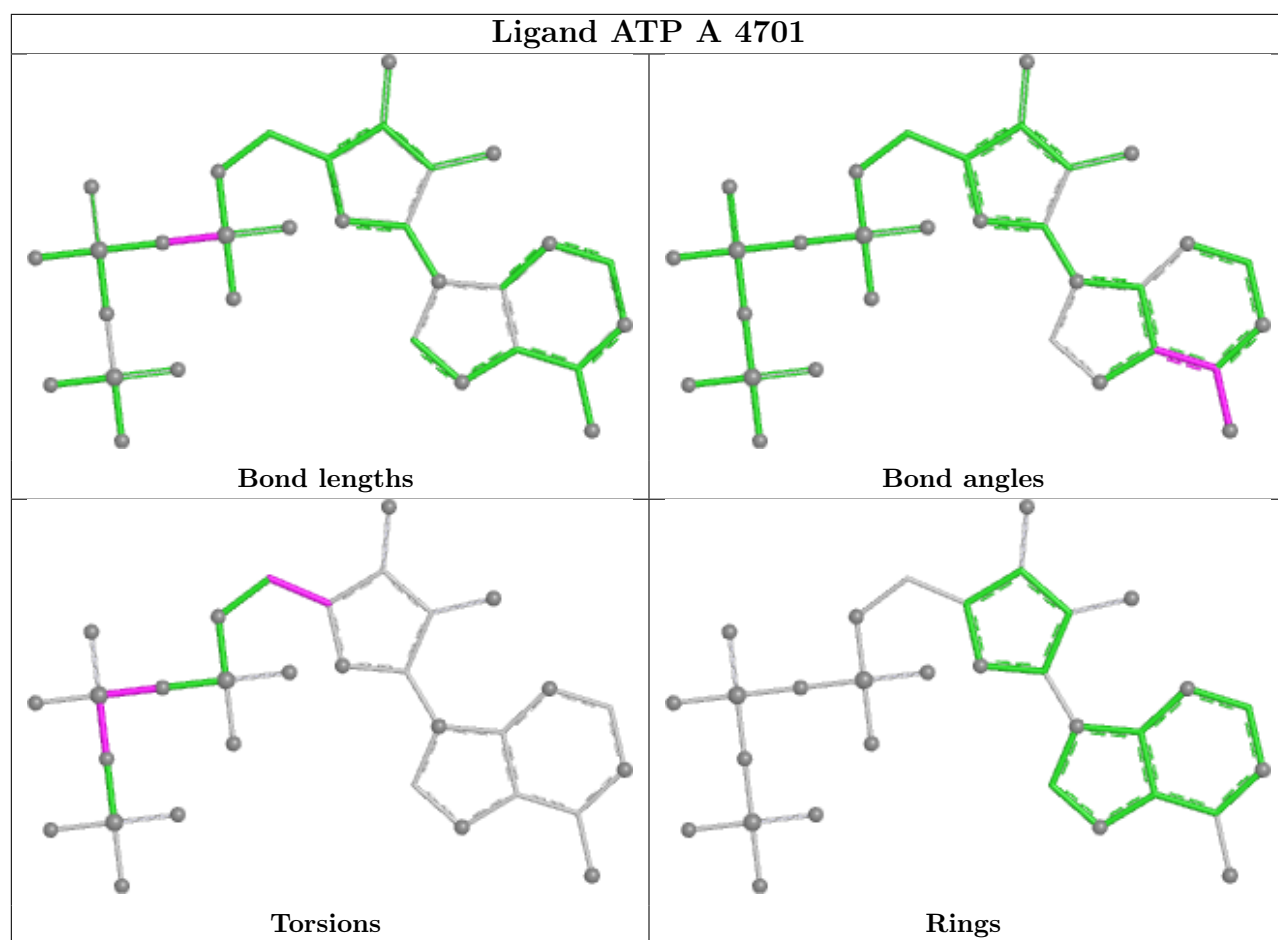
Mol	Chain	Res	Type	Atoms
2	A	4701	ATP	C3'-C4'-C5'-O5'
3	A	4703	ADP	C5'-O5'-PA-O1A
2	A	4701	ATP	PG-O3B-PB-O2B
2	A	4701	ATP	PA-O3A-PB-O1B

There are no ring outliers.

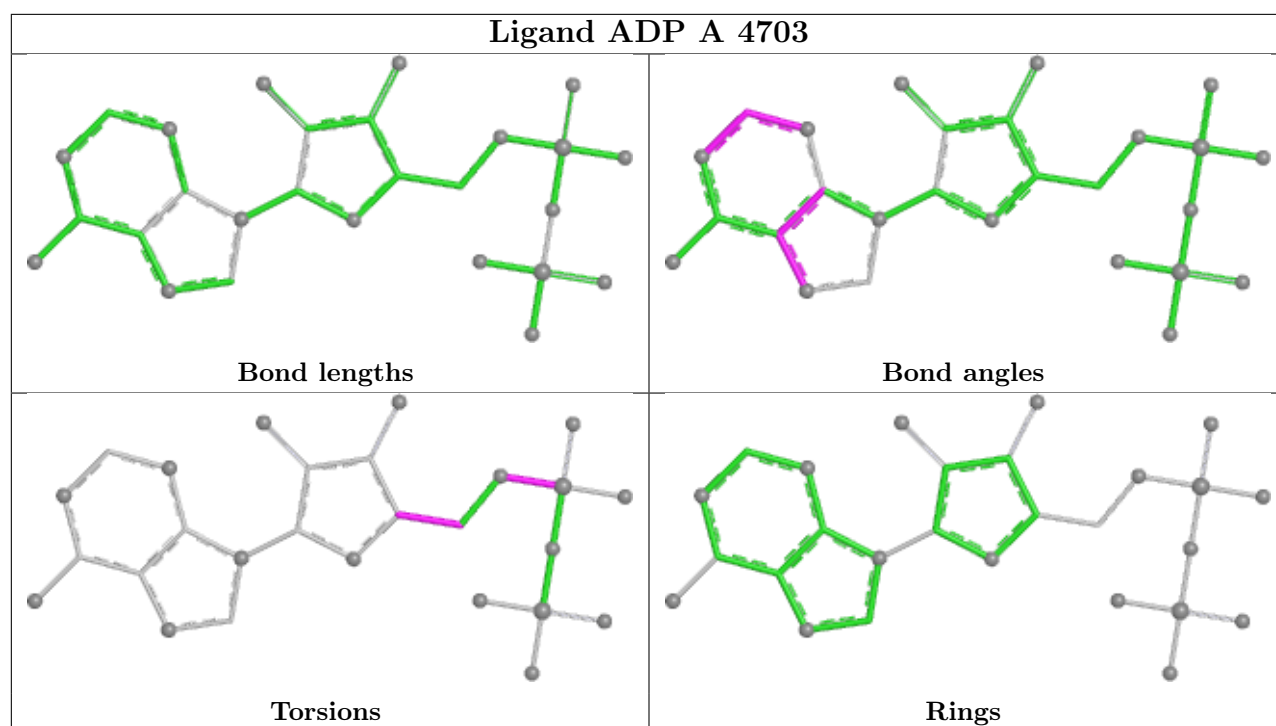
3 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4701	ATP	4	0
3	A	4702	ADP	5	0
3	A	4703	ADP	2	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 [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

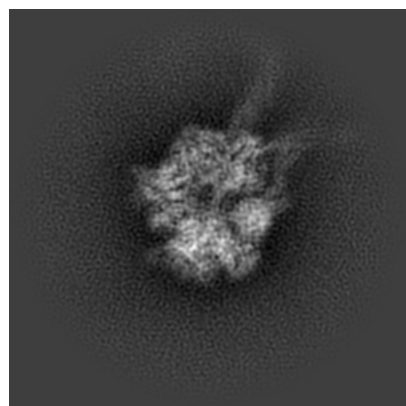
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44718. These allow visual inspection of the internal detail of the map and identification of artifacts.

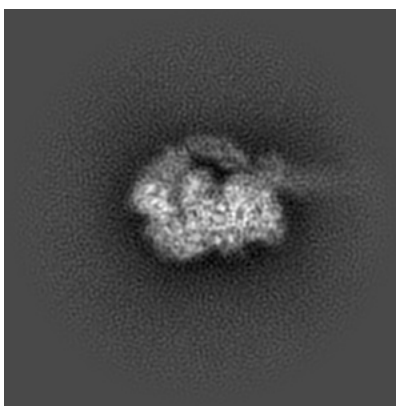
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

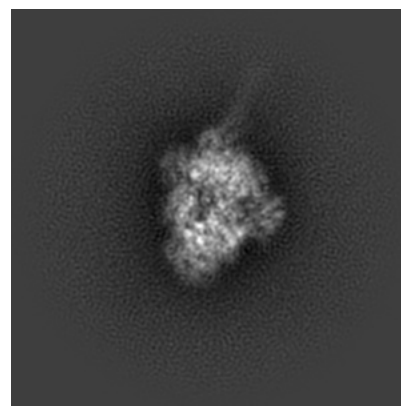
#### 6.1.1 Primary map



X

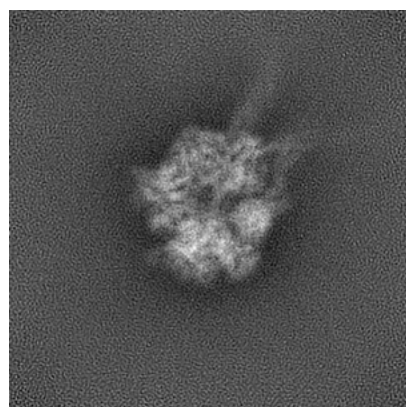


Y

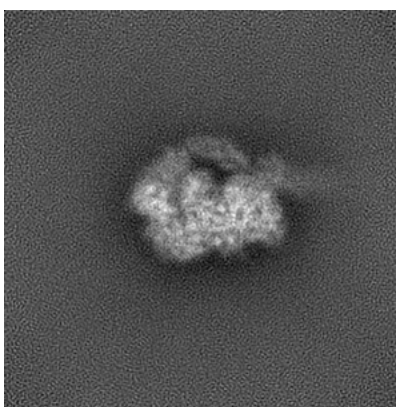


Z

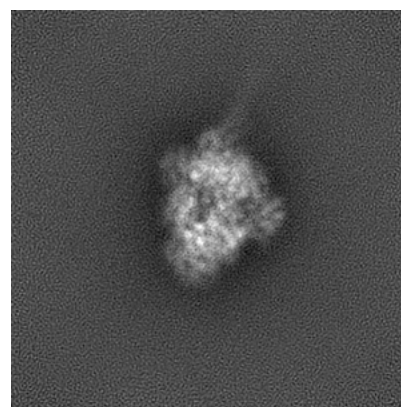
#### 6.1.2 Raw map



X



Y

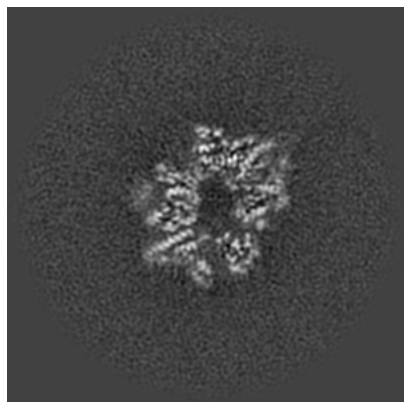


Z

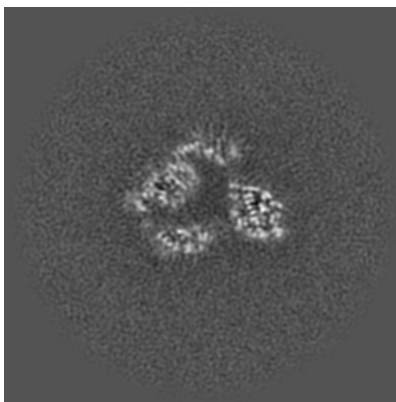
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

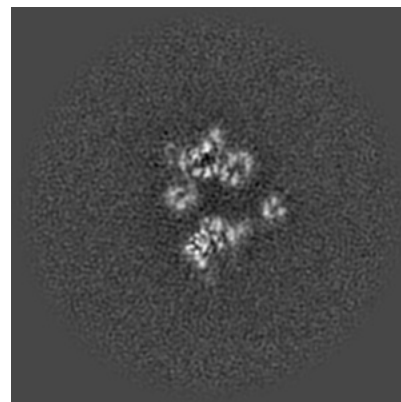
### 6.2.1 Primary map



X Index: 128

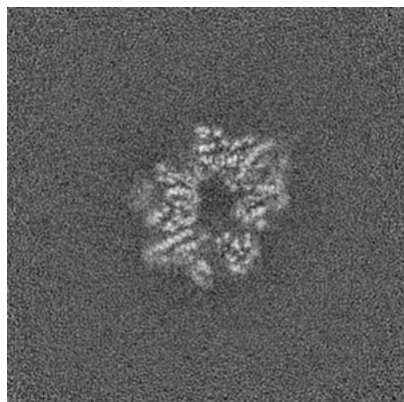


Y Index: 128

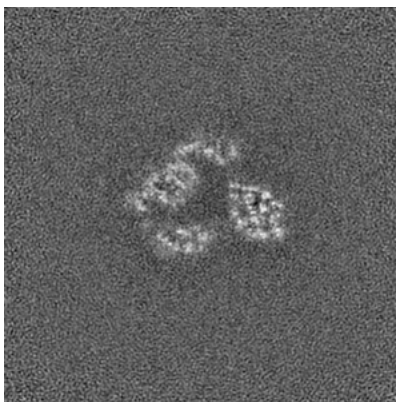


Z Index: 128

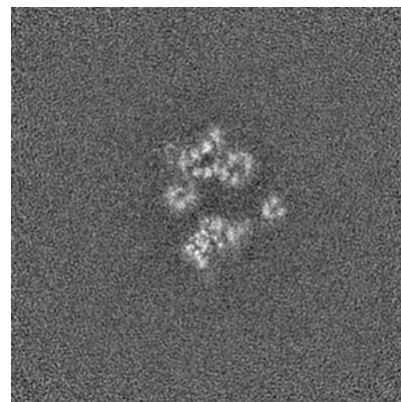
### 6.2.2 Raw map



X Index: 128



Y Index: 128

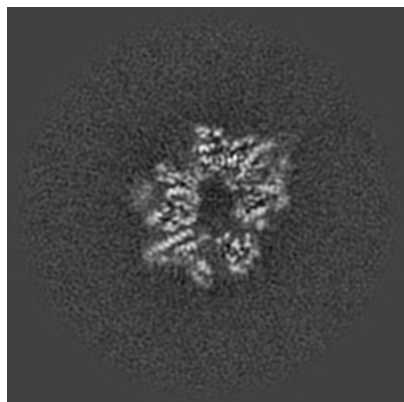


Z Index: 128

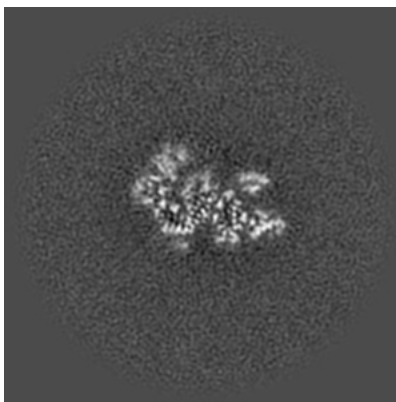
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

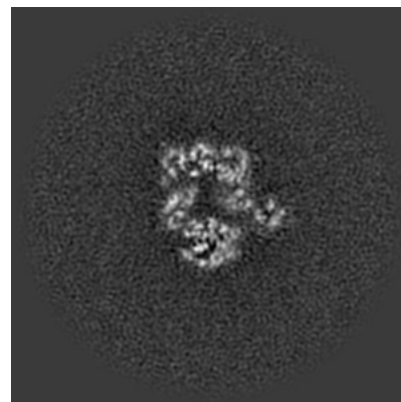
### 6.3.1 Primary map



X Index: 128

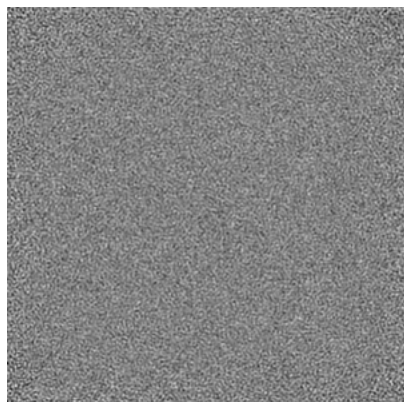


Y Index: 111

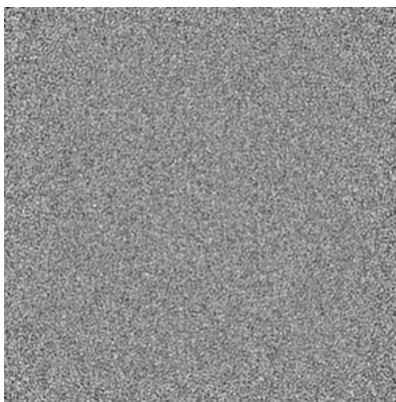


Z Index: 119

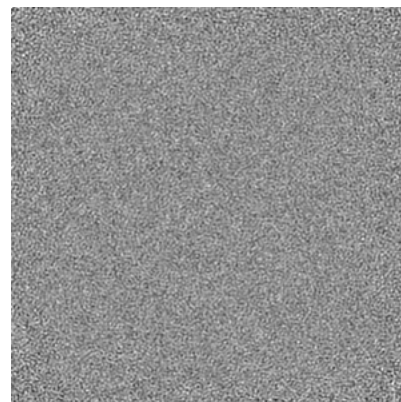
### 6.3.2 Raw map



X Index: 0



Y Index: 0



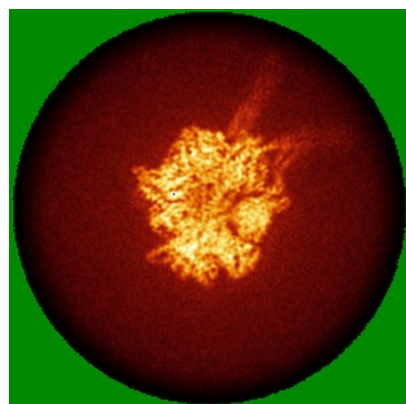
Z Index: 0

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

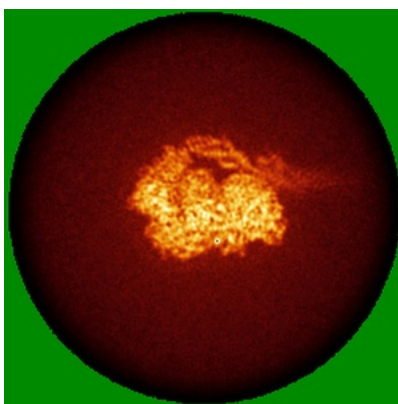


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

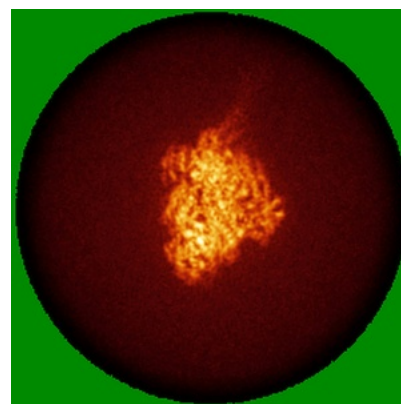
### 6.4.1 Primary map



X

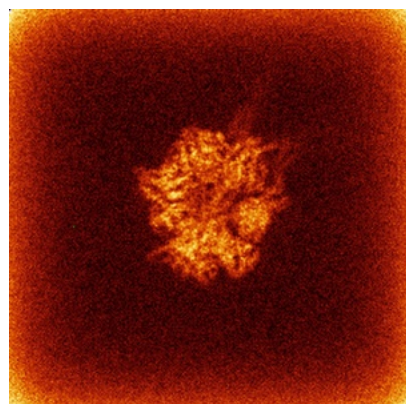


Y

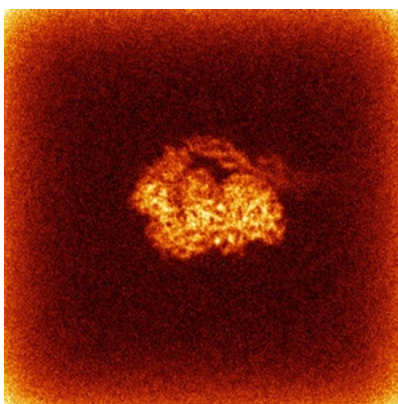


Z

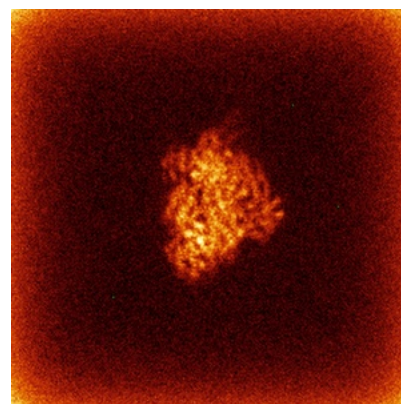
### 6.4.2 Raw map



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.

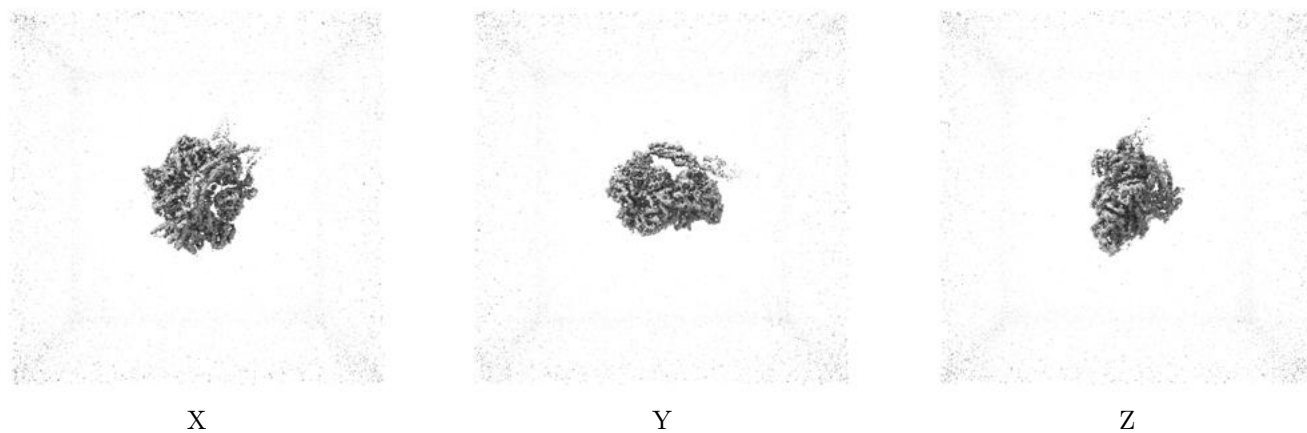
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.2. 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.

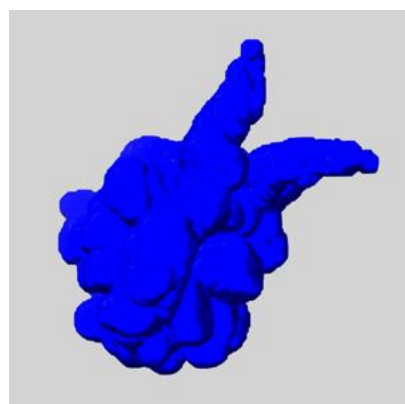
## 6.6 Mask visualisation [i](#)

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

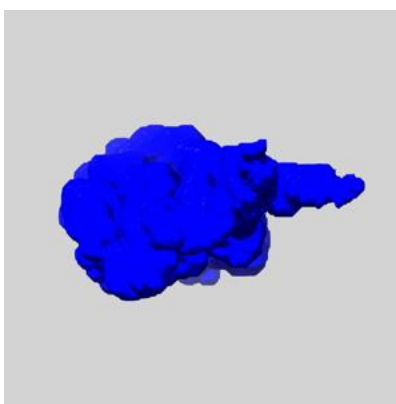
A mask typically either:

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

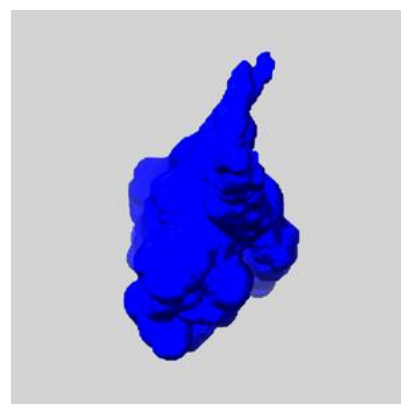
### 6.6.1 emd\_44718\_msk\_1.map [i](#)



X



Y

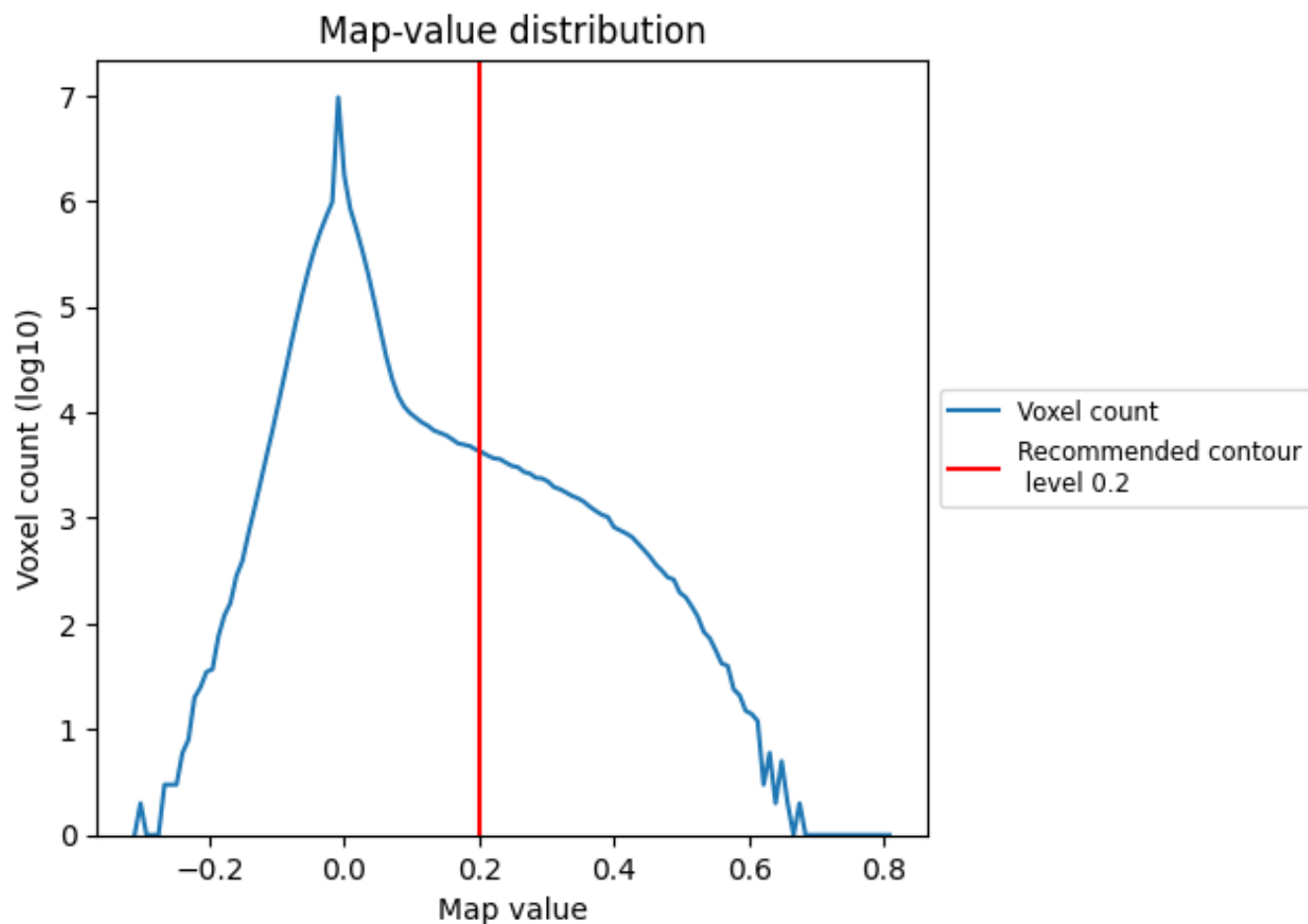


Z

## 7 Map analysis [i](#)

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

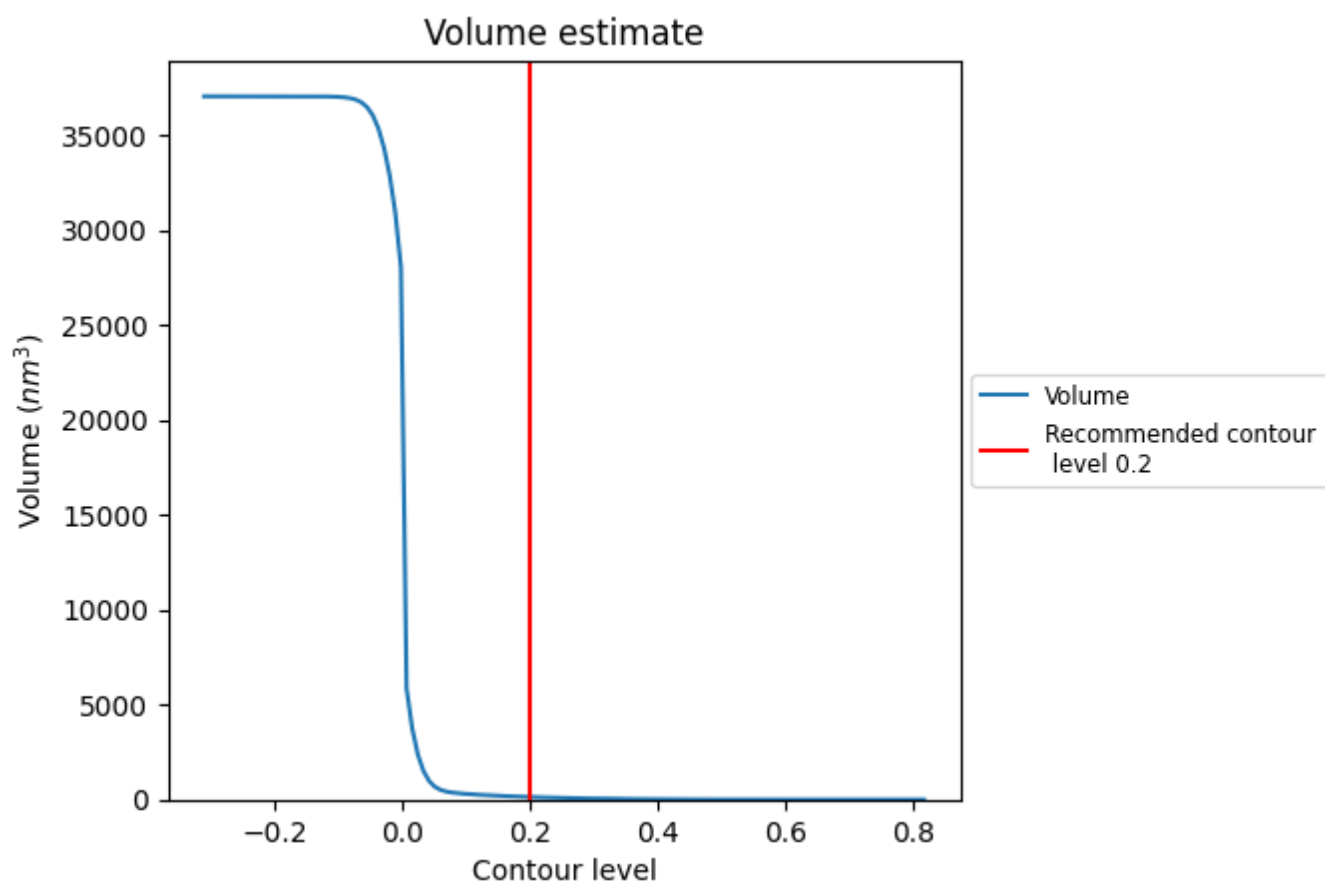
### 7.1 Map-value distribution [i](#)



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.



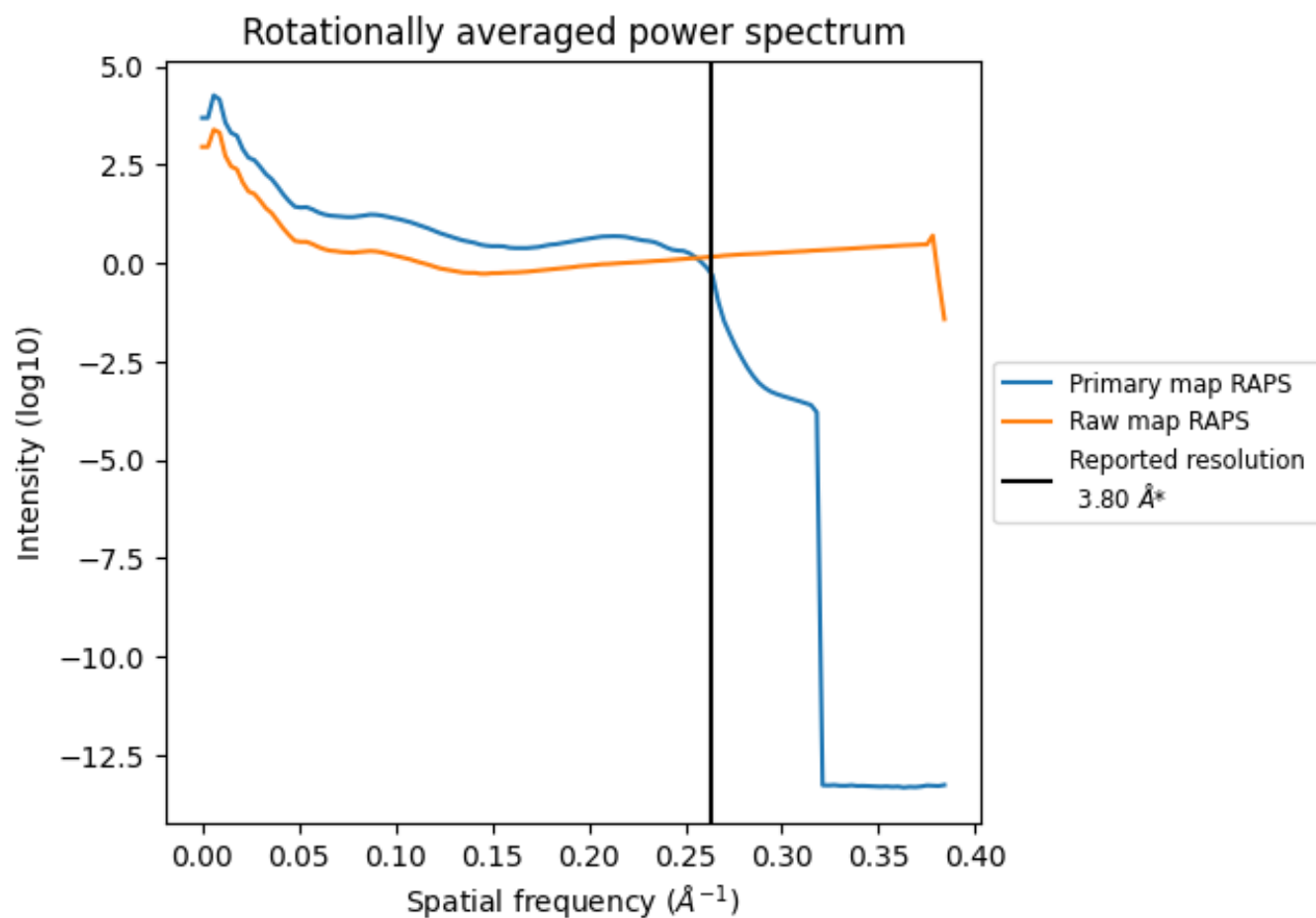
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 134 nm<sup>3</sup>; this corresponds to an approximate mass of 121 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 ⓘ

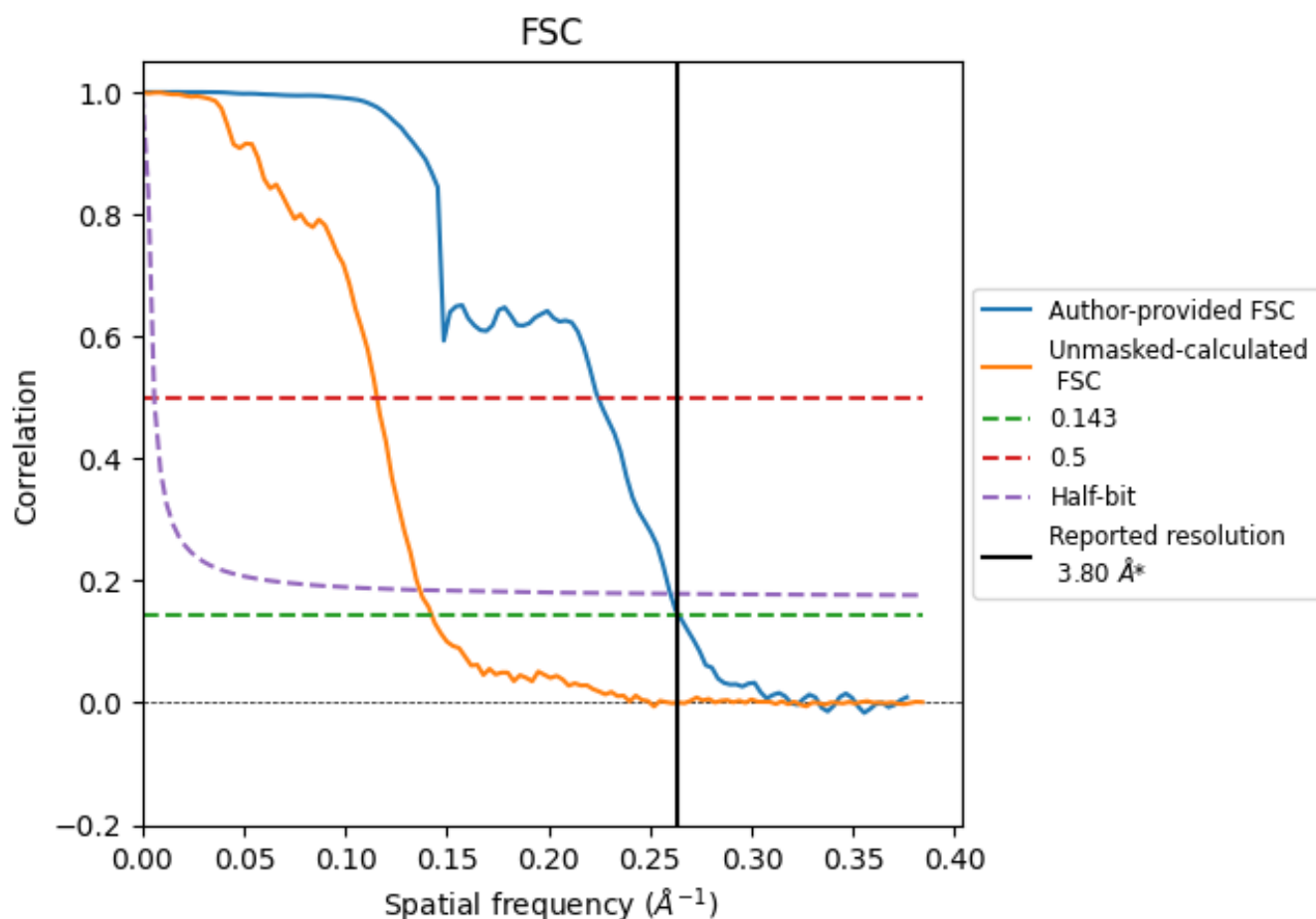


\*Reported resolution corresponds to spatial frequency of 0.263 Å<sup>-1</sup>

## 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  $0.263 \text{ \AA}^{-1}$

## 8.2 Resolution estimates [i](#)

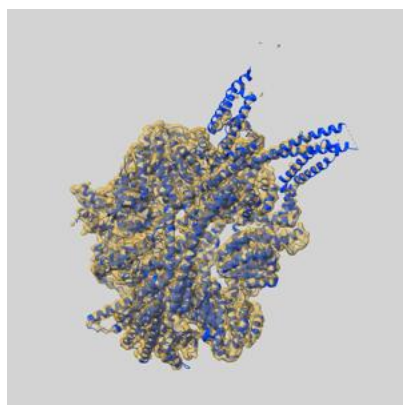
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.78	4.46	3.84
Unmasked-calculated*	7.01	8.65	7.31

\*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 7.01 differs from the reported value 3.8 by more than 10 %

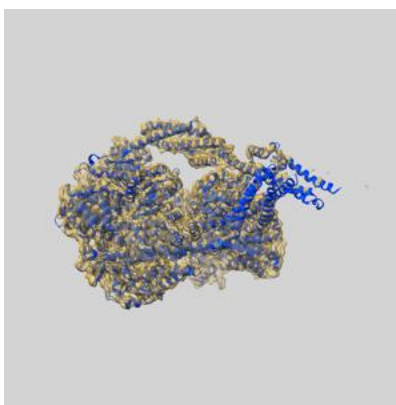
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-44718 and PDB model 9BN1. Per-residue inclusion information can be found in [section 3](#) on [page 5](#).

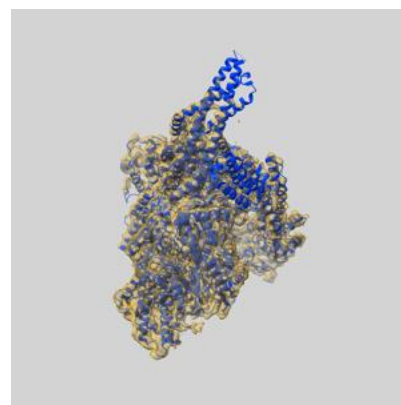
### 9.1 Map-model overlay [i](#)



X



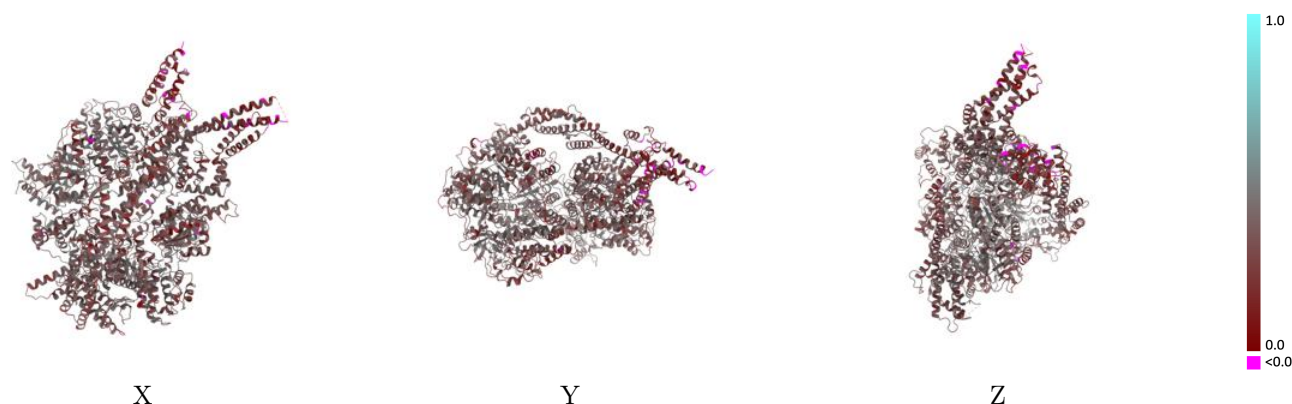
Y



Z

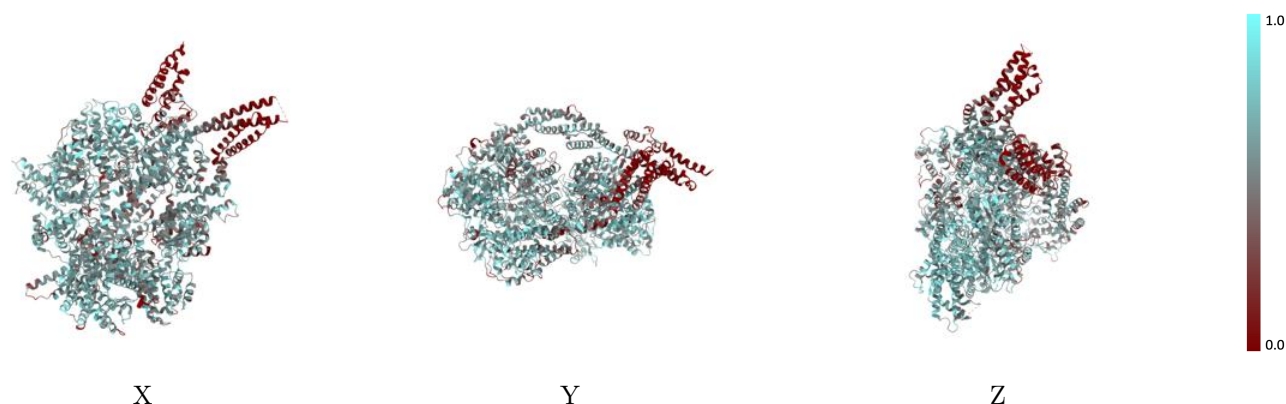
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



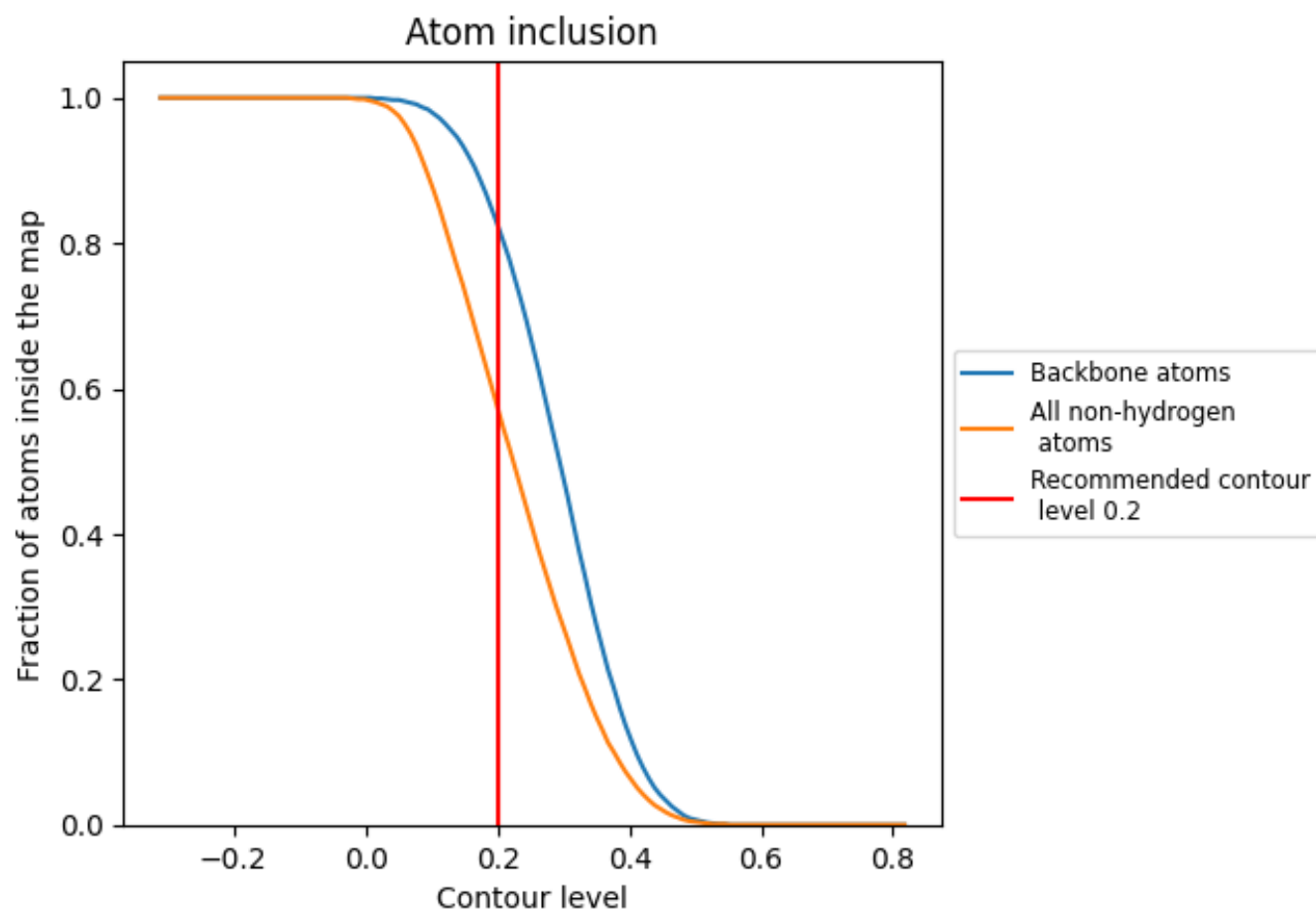
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.2).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 57% 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 (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.5750	<div></div> 0.3490
A	<div></div> 0.5750	<div></div> 0.3490

