



## wwPDB EM Validation Summary Report ⓘ

May 25, 2025 – 09:23 PM EDT

PDB ID : 9BMV / pdb\_00009bmv  
EMDB ID : EMD-44712  
Title : State-7a-post1 of motor domain from full-length human dynein-1 in 5 mM ADP  
Authors : Chai, P.; Zhang, K.  
Deposited on : 2024-05-02  
Resolution : 3.70 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

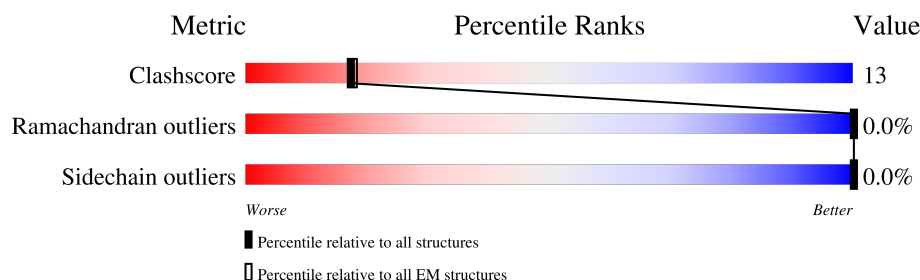
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.70 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>9%</div> <div>45%</div> <div>20%</div> <div>35%</div> </div>

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 24616 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	3043	24503	15606	4234	4541	122	0	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
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	1	Total Mg 1 1	0





SER	L3115	L3020	F2926	V2838	L2723	R2643	R2519	A2420	L2335	H2252	E2133	G2021
GLN	E3116	F3021	R2927	E2859	R2726	T2644	T2557	A2421	P2336	I2253	E136	TYR
GLU	Y3125	E3022	Q2930	D2840	F2727	P2645	T2552	I2421	P2337	A2258	I2137	ALA
VAL	Y3130	G3023	H2932	E2842	L2728	G2647	V2524	I2422	M2338	I2259	I2138	GLY
LYS	D3024	D3025	L2935	R2843	R2729	V2648	P2527	S2429	I2341	K2260	V2141	ARG
ASN	D3131	E3025	L2935	R2844	H2730	V2649	D2536	N2430	M2342	K2261	S2026	
ALA	L3132	L3029	G2940	A2651	L2731	L2650	D2536	K2435	F2343	D2262	V2146	P2029
ALA	P3134	M3030	G2940	D2851	V2732	A2651	P2544	L2437	E2344	H2263	D2030	D2030
ASN	R3140	Q3032	K2943	H2857	L2744	K2657	V2545	E2438	Q2346	L2264	L2149	L2035
ASP	E3142	Q3038	L2946	V2860	I2747	V2660	V2557	H2439	D2347	D2269	L2156	M2041
LYS	I3143	K3039	L2956	I2861	A2754	L2661	T2558	Q2442	T2352	P2270	L2161	P2044
LYS	S3146	E3040	S2957	D2862	R2757	G2663	T2559	A2451	L2353	N2271	M2176	
MET	V3150	G3041	V2958	R2863	E2761	D2664	T2571	L2455	A2354	T2272	E2181	M2053
VAL	L3042	L3042	K2962	E2864	M2773	E2665	L2571	L2456	R2358	E2274	S2056	L2054
LYS	L3043	L3044	V2963	M2867	Y2774	L2668	T2574	G2456	M2361	W2275	C2186	Y2055
ASP	L3044	D3045	H2964	R2868	Y2775	L2669	V2575	S2457	F2364	T2277	L2191	S2056
GLN	S3046	S3046	R2965	S2869	E2775	P2669	H2577	S2460	L2462	G2278	T2192	R2060
GLU	A3162	K2966	K2966	D2870	E2775	D2670	E2578	M2461	L2369	T2281	W2203	L2065
ALA	E3049	G2969	G2969	Y2873	M2779	M2671	E2578	L2462	L2387	L2284	W2204	A2066
GLU	R3167	L3050	E2970	S2874	E2782	D2672	L2581	H2463	D2372	L2287	E2205	L2069
GLU	T3168	L3050	E2970	M2875	E2782	K2673	Y2582	Q2464	M2373	L2287	K2206	L2080
LYS	M3169	N3061	D2973	Y2876	E2782	G2675	T2583	A2465	L2382	R2292	Q2209	Q2083
LYS	R3174	T3067	D2973	S2878	D2787	T2676	L2585	N2473	P2386	G2293	L2210	Y2086
VAL	D3178	F3072	L2976	K2879	T2788	F2682	K2589	M2481	L2387	E2294	L2211	
MET	F3179	D2880	L2976	Y2880	Q2789	I2683	P2590	L2486	D2387	E2294	T2214	
SER	I3180	Y2881	L2976	D2881	H2791	R2684	L2591	E2487	L2295	Q2296	L2220	L2093
GLN	M3199	G3074	L2980	V2884	Y2792	Q2685	V2592	R2488	D2388	K2297	M2221	K2094
GLN	H3200	R2981	R2981	D2885	Y2792	M2686		Y2489	E2391	R2298	M2222	
GLN	L3075	R2981	R2982	D2885	Y2792	M2686		L2490	D2392	L2301	G2224	
LEU	K3076	K3076	C2985	E2888	E2798	V2687	P2596	Q2491	E2393			
LEU	S3077	S3077	K2986	L2889	M2799	E2688		Y2493	A2394	D2304		L2097
HIS	R3078	R3078	N2987	L2889	R2804	H2689	K2601	Q2492	Q2395	G2305	K2230	N2102
LYS	A3079	A3079	E2988	V2893	R2811	R2694	T2602	L2493	R2397	D2306	W2231	V2103
GLN	A3080	A3080	L2897	L2897	P2812	D2697	W2603	V2495	R2397	D2307	K2231	R2104
GLU	K3207	A2991	F2992	Y2901	P2812	K2702	S2607	L2499	K2399	D2308	W2234	R2105
VAL	I3208	F2992	I2993	E2902	L2816	L2703	P2613	S2503	G2400	P2309	R2235	K2110
ILE	K3209	I2993	M2994	E2903	P2817	E2704	D2614	G2504	K2401	E2310	W2236	I2111
ALA	E3210	D2995	E2996	E2904	V2818	R2705	M2615	D2505	V2311	W2311	V2236	K2112
ASP	K3211	E2996	E2996	L2905	I2706	Q2707	G2619	S2506	K2402	E2313	K2239	R2113
LYS	V3212	S2997	D2996	D2906	G2820	F2708	L2650	L2507	D2403	N2314	A2240	E2114
GLN	D3213	N3092	N2998	L2905	R2823	V2709	S2623	K2509	E2404	L2315	R2243	K2115
MET	Q3214	W3093	V2999	G3095				M2510	G2405	V2318	L2244	E2116
VAL	V3215	F3094	L3000	V2910	L2830	C2712	E2629	E2406	E2406	E2245	E2245	G2119
GLU	E3216	D3096	I3001	V2915	R2831	D2717	L2630	L2514	E2407	K2323	G2246	V2122
ASP	E3217	L2915	F3004	L2916	F2833	P2718	L2634	G2515	E2407	L2324	E2247	
LEU	L3218	L3005	F3004	L2916	Q2834	G2719	F2635	E2516	A2408	L2325	E2248	L2131
LYS	R3219	E3006	L2920	L2920	D2835	R2720	F2635	Y2517	A2409	L2325	E2248	P2132
VAL	R3220	R3007	R2921	R2921	R2836	R2720	F2635	L2518		L2333	S2334	
	D3221	V3017		I2925	L2837							
LEU	K3112	K3112										
ARG	D3113	D3113										
ILE												
LYS												

N4597	S4485	R4230	K4089	E3930	I3835	E3746	L3849	R3561	ALA	LEU	ASN
T4598	H4466	L4243	M4095	Q3931	V3839	K3747	M3650	W3562	ALA	LYS	PHE
E4599	A4470	M4247	L4096	E3932	L3840	S3748	E3652	W3662	VAL	ARG	ILE
K4600	A4471	A4248	K4097	E3933	N3845	L3749	V3653	L3567	A3470	VAL	THR
V4604	G4472		R4098	R3937	D3851	Q3750	R3654	T3574	K3471	LEU	ILE
	T4473	I4251	W4099		D3852	Q3751	R3655	E3575	V3472	ARG	VAL
L4607	V4474	I4252	Q3952	Q3952	R3853	A3752	L3753	A3577	R3474	ASN	ASN
P4608	V4475	F4280	P3966	P3966	Q3854	N3754	Q3657	I3578	S3475	GLY	PHE
V4609	Q4477	F4280	L4106	P3966	Q3854	E3755	G3658	M3579	T3476	LEU	ALA
	W4478	L4269	W4107	V3970	R3855	V3756	R3659		L3482	GLN	VAL
N4612	V4479		Q4108		R3858	V3757		R3582	T3477	LYS	GLU
	S4480		L4109	L3973	I3858	K3757			A3477	LEU	SER
I4619	D4481	S4277	E4110		L3863	Q3758		R3585	L3478	GLY	LYS
F4620	I4391	E4281	L4113	E3977	F3864	R3759	T3662	R3585	L3479	ASP	ASP
	P4392	F4282	L4113		Q3865	L3564	L3664	L3588	V3472	ALA	GLN
D4623	Q4393	T4394	P4118	P3982	V3866	I3760	G3665		R3480	ILE	HIS
F4624	R4485	L4395	P4118	L3983	R3869	D3762	D3666	D3591	S3481	ARG	LEU
	I4486		R4123	L3983	R3870	L3761	Q3667		L3482	ASN	GLU
A4627			L4124	Q3984	R3870	D3763		Q3595	T3476	ASP	LYS
	S4493	G4290	L4124	Q3985	V3871	D3763		A3596	A3477	GLN	VAL
E4630	K4399	H4291	R4400	R3989	A3872	T3765		F3599	L3478	GLN	MET
	A4496		N4131	R3989	R3873	T3765		M3601	L3479	ASN	VAL
F4635	A4501	L4294	L4138	L3992	G3874	I3766	L3679	F3599	L3479	LYS	ARG
Y4636	E4637	I4300	L4139	L3992	G3874	I3766	S3680	M3601	L3479	ALA	ASN
E4638	L4504	I4405	R4140	F3996	M3875	I3767	T3681	N3602	R3486	GLU	MET
G4639		E4304	R4140		H3880	T3768		E3603	R3486	ALA	ASN
V4640	L4511		F4145	D3999	F3883	T3769		K3608	T3492	GLN	PRO
	L4511		W4320	R4000	F3883	L3770		P3689	T3492	MET	ALA
E4518	F4410	L4321	E4148	L4001	L3886	E3771		P3690	T3502	ILE	VAL
	B4411		L4002	L4002	L3887	N3772		T3610	T3502	ARG	ASN
V4528	F4412	P4324	R4168	H4006	A3888	L3773		R3611	L3508	LEU	TYR
	F4413	H4385	S4172	N4012	R3889	L3773		L3612	L3509	GLU	GLU
L4541	E4414	N4326	P4173	R3991	L3890	R3775		L3615	S3510	ALA	ILE
			W4174	R3991	L3892	R3775		D3616	A3511	VAL	ASN
Q4549	V4417	L4332	E4175	L3892		E3776		D3617	T3514	SER	SER
			R4176	L4025	A3777	A3777		D3618	A3515	ILE	ARG
D4554	L4423	K4342	R4176	L4026	A3778	E3778		A3618	Y3516	ALA	CYS
A4555	M4343	M4343	L4187	L4027	A3778	E3779		F3619	G3518	ARG	LEU
C4556	R4428	L4344	L4188	L4027	E3779	E3779		R3620	A3517	TYR	LEU
S4557	C4438	R4345	L4183	L4027	E3779	E3779		N3621	G3518	LYS	ALA
		M4346	L4183		E3779	E3779		L3622	G3518	GLY	GLY
V4560	L4439	L4349	F4186	T4030	Q3906	T3781		L3623	F3520	TYR	PRO
	K4441	GLU	H4187	P4037	L3909	R3782			A3626	VAL	THR
K4564	K4442	ASP	A4188	N4038	R3910	K3783		L3708	M3524	ALA	ASP
	K4443	GLU	L4190	T4039	V3784	V3784		E3720	R3525	VAL	THR
K4574	Q4444	ASP	R4193	P4040	E3785	E3785			R3525	LYS	LYS
	T4445	ASP	W4041	W4041	E3786	E3786		R3628	W3532	TRP	TRP
L4577	T4445	ASP	A4215	M4043	V3915	T3787		G3629	L3536	ILE	ALA
S4576	C4216	LEU	C4216	M4043	L3916	D3788		G3630	L3536	GLY	GLN
V4579	D4217	ALA	D4217	C4044	L3916	D3788		N3631	L3536	ALA	ILE
	T4218	ALA	S4045	S3917	L3917	D3788		P3632	F3543	GLN	GLN
R4449	T4218	ALA	S4045	S3917	L3917	D3788		V3635	R3544	ILE	ASN
	W4446	ALA	W4046	A3918	A3918	D3788		V3638	T3545	LYS	TYR
L4590	R4449	GLU	V4219	G3919	G3919	D3788		E3639	D3546	ILE	WET
R4591	T4219	GLU	D4220	A4051	S3920	D3788		V3638	D3546	ALA	ALA
W4592	D4220	GLU	D4220	A4051	S3920	D3788		E3639	R3549	ASP	ASP
	E4454	THR	A4227		I3924	D3788		V3648	L3553	GLU	ARG
L4460	L4460	LYS			L3924	D3788			D3557	LEU	MET
P4461	P4461	LYS			L3927	D3788			E3568		
W4464	W4464	LVS			L3927	D3788					



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	47280	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	0.717	Depositor
Minimum map value	-0.337	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.024	Depositor
Recommended contour level	0.12	Depositor
Map size (Å)	329.984, 329.984, 329.984	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0312, 1.0312, 1.0312	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	0.16	0/25022	0.34	0/33900

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.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1567	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	24503	0	24574	659	0
2	A	81	0	36	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	31	0	12	3	0
4	A	1	0	0	0	0
All	All	24616	0	24622	659	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 13.

The worst 5 of 659 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:4189:ILE:HD11	1:A:4321:LEU:HA	1.55	0.88
1:A:3818:LEU:HA	1:A:4346:MET:HE1	1.61	0.81
1:A:1551:PHE:HA	1:A:1557:ILE:HD11	1.63	0.80
1:A:3178:ASP:HB2	1:A:3585:ARG:HH21	1.48	0.78
1:A:1632:VAL:HB	1:A:1657:MET:HE1	1.66	0.78

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	3035/4646 (65%)	2956 (97%)	78 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1511	PRO

### 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	2706/4125 (66%)	2705 (100%)	1 (0%)	100	100

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1567	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 27 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2475	ASN
1	A	2786	GLN
1	A	4191	GLN
1	A	2698	GLN
1	A	3032	GLN

### 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 5 ligands modelled in this entry, 1 is 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$
3	ATP	A	4702	4	28,33,33	0.75	0	34,52,52	0.61	1 (2%)
2	ADP	A	4701	-	24,29,29	0.87	0	29,45,45	1.26	3 (10%)
2	ADP	A	4704	-	24,29,29	0.85	0	29,45,45	1.24	2 (6%)
2	ADP	A	4703	-	24,29,29	0.87	0	29,45,45	1.29	3 (10%)

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
3	ATP	A	4702	4	-	5/18/38/38	0/3/3/3
2	ADP	A	4701	-	-	3/12/32/32	0/3/3/3
2	ADP	A	4704	-	-	2/12/32/32	0/3/3/3
2	ADP	A	4703	-	-	5/12/32/32	0/3/3/3

There are no bond length outliers.

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	4703	ADP	N3-C2-N1	-3.62	123.76	128.67
2	A	4704	ADP	N3-C2-N1	-3.57	123.83	128.67
2	A	4701	ADP	N3-C2-N1	-3.54	123.86	128.67
2	A	4704	ADP	C4-C5-N7	-2.53	106.67	109.34
2	A	4701	ADP	C4-C5-N7	-2.48	106.72	109.34

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	4703	ADP	C5'-O5'-PA-O1A
2	A	4703	ADP	C5'-O5'-PA-O3A

*Continued on next page...*

*Continued from previous page...*

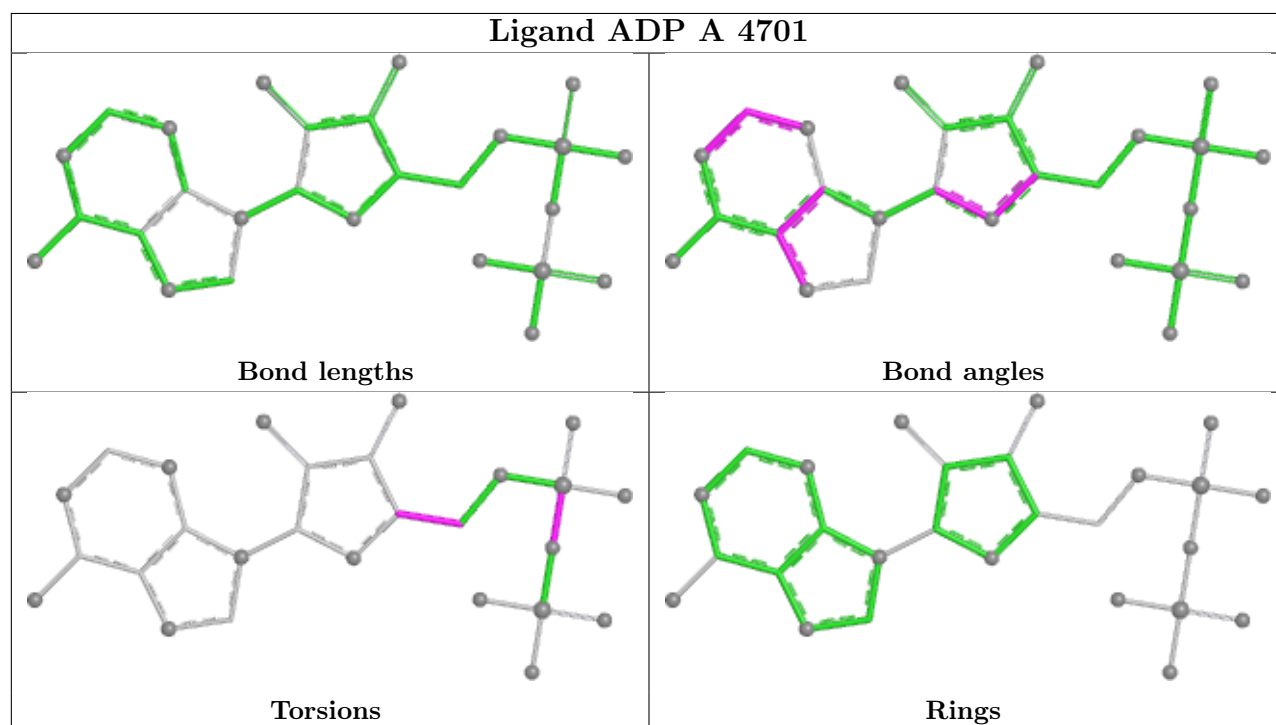
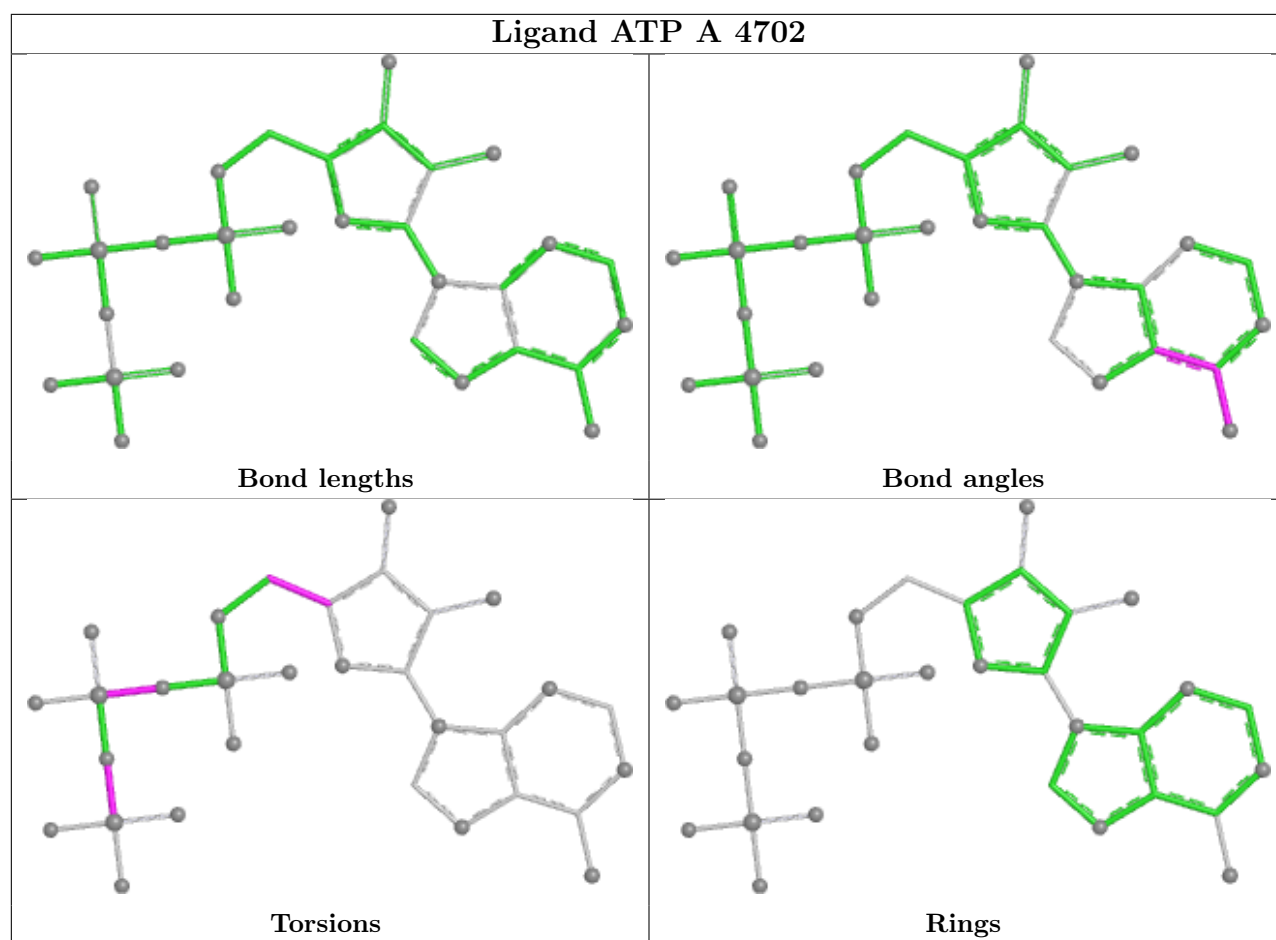
Mol	Chain	Res	Type	Atoms
2	A	4704	ADP	C5'-O5'-PA-O2A
2	A	4704	ADP	C5'-O5'-PA-O3A
3	A	4702	ATP	PB-O3B-PG-O3G

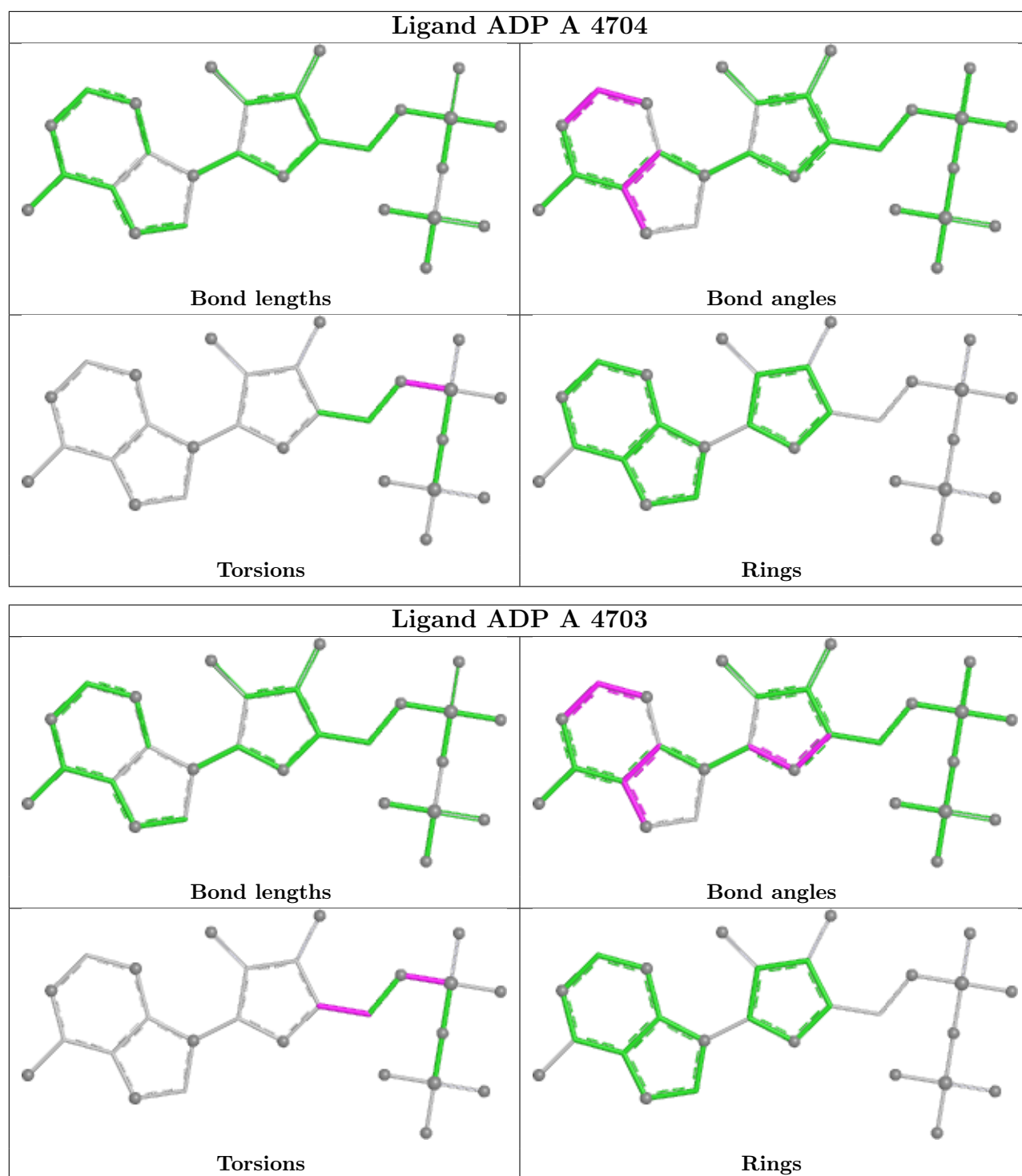
There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	4702	ATP	3	0
2	A	4701	ADP	3	0
2	A	4704	ADP	3	0
2	A	4703	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.

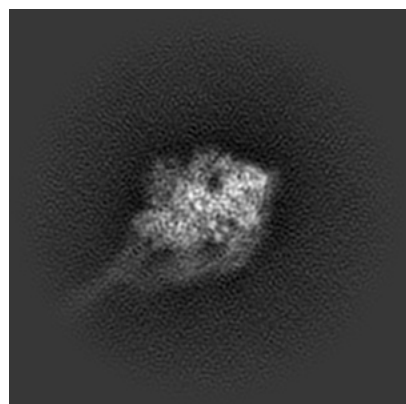
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44712. These allow visual inspection of the internal detail of the map and identification of artifacts.

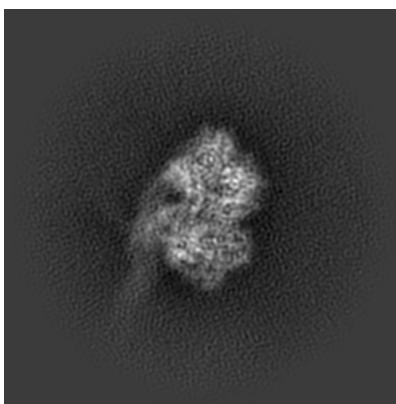
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

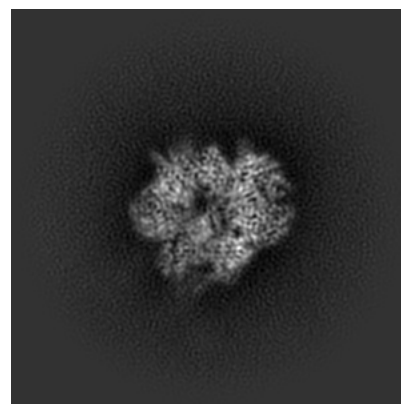
#### 6.1.1 Primary map



X

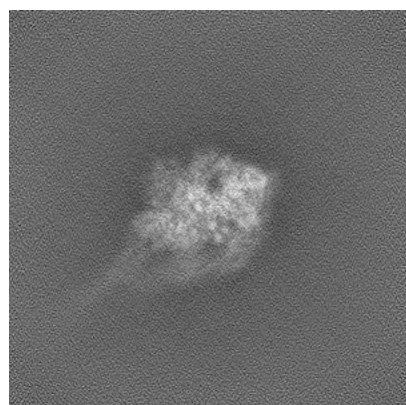


Y

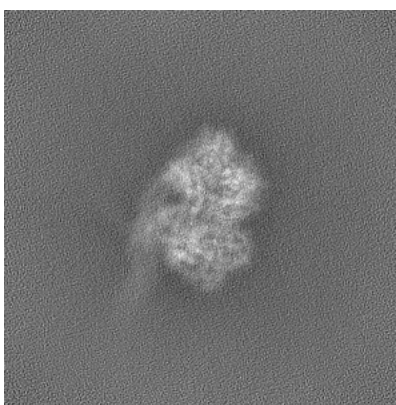


Z

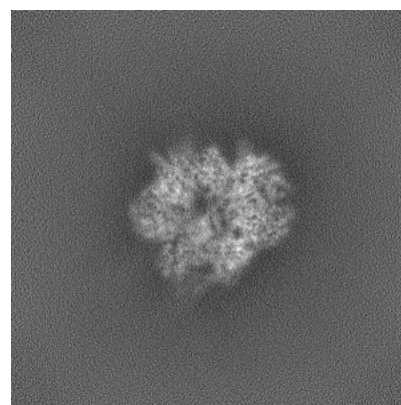
#### 6.1.2 Raw map



X



Y

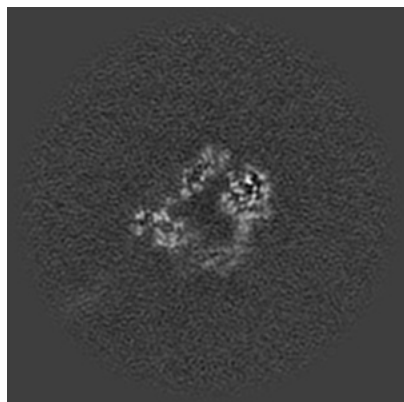


Z

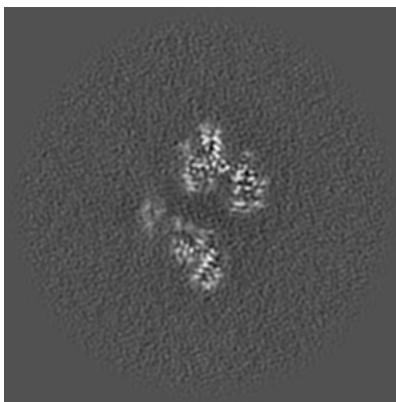
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

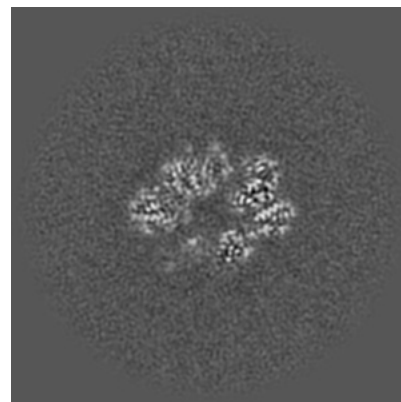
### 6.2.1 Primary map



X Index: 160

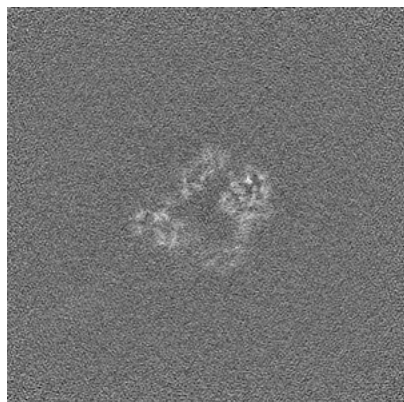


Y Index: 160

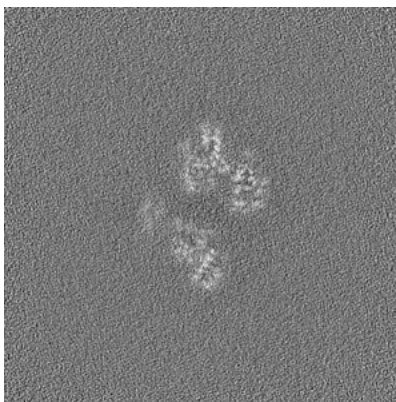


Z Index: 160

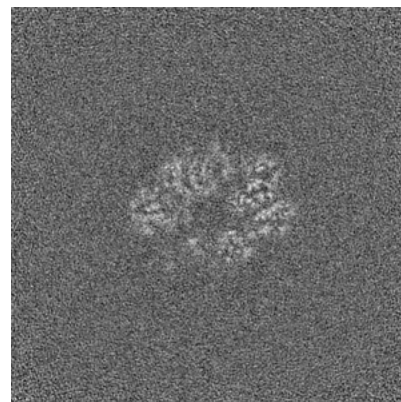
### 6.2.2 Raw map



X Index: 160



Y Index: 160

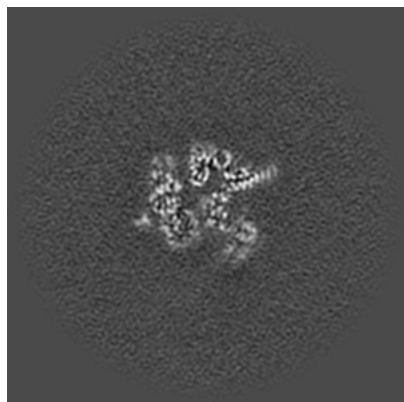


Z Index: 160

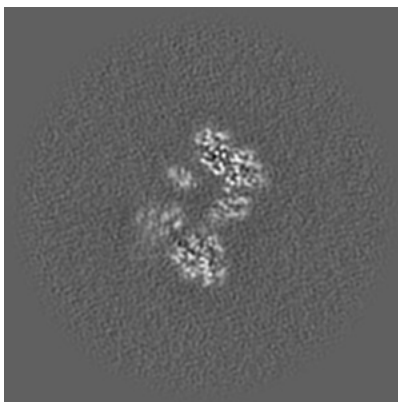
The images above show central slices of the map in three orthogonal directions.

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

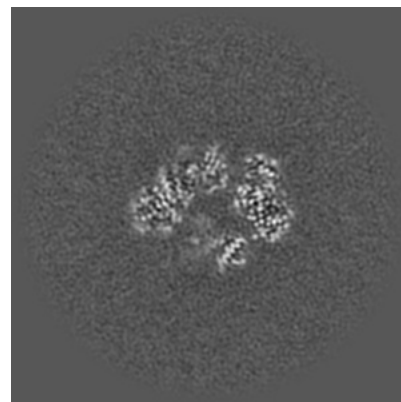
### 6.3.1 Primary map



X Index: 182

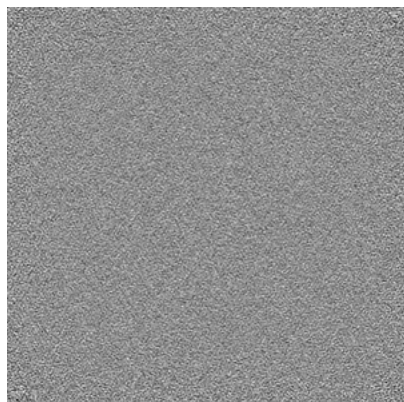


Y Index: 150

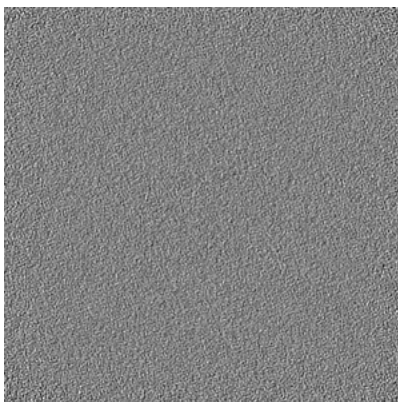


Z Index: 165

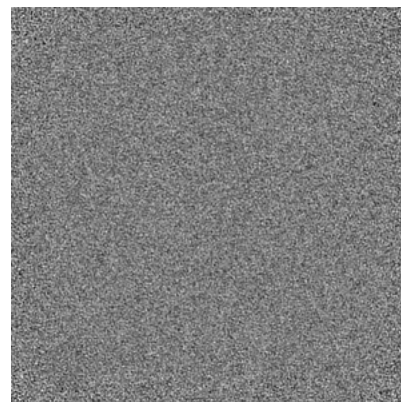
### 6.3.2 Raw map



X Index: 0



Y Index: 0



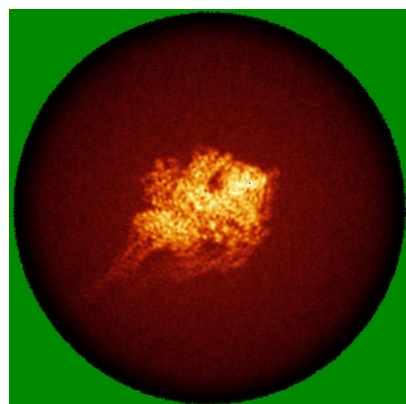
Z Index: 0

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

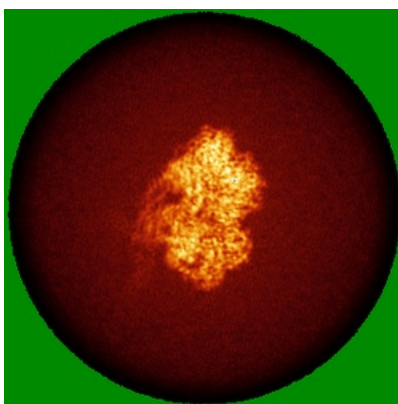


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

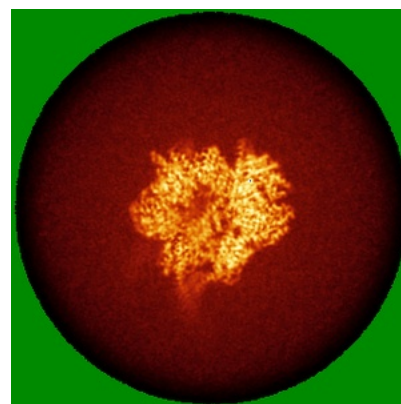
### 6.4.1 Primary map



X

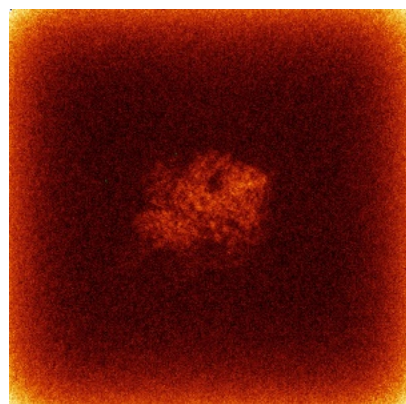


Y

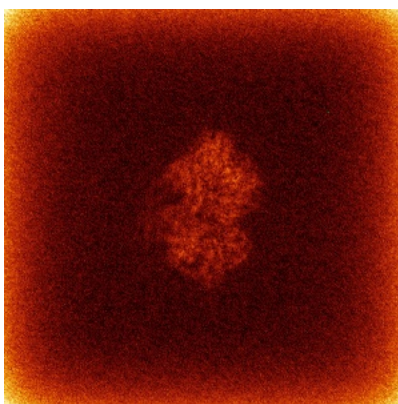


Z

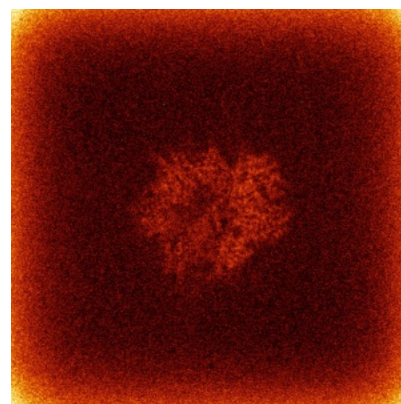
### 6.4.2 Raw map



X



Y

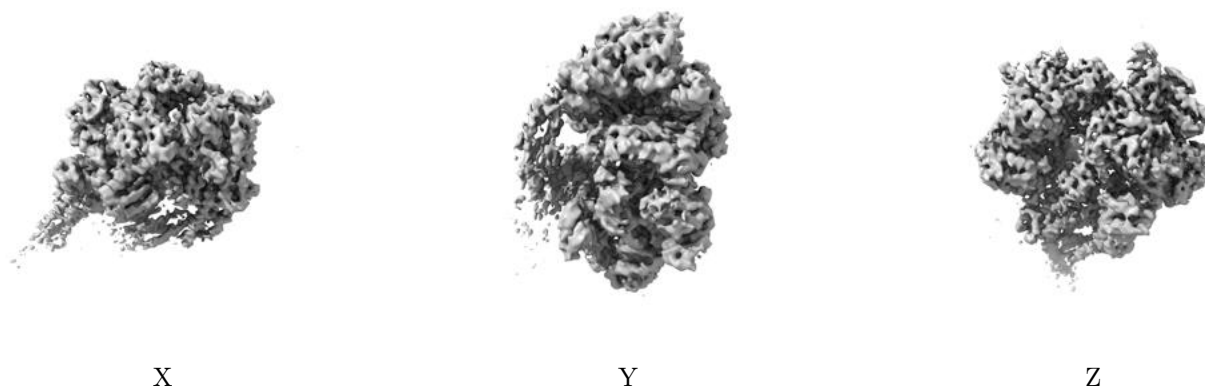


Z

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.

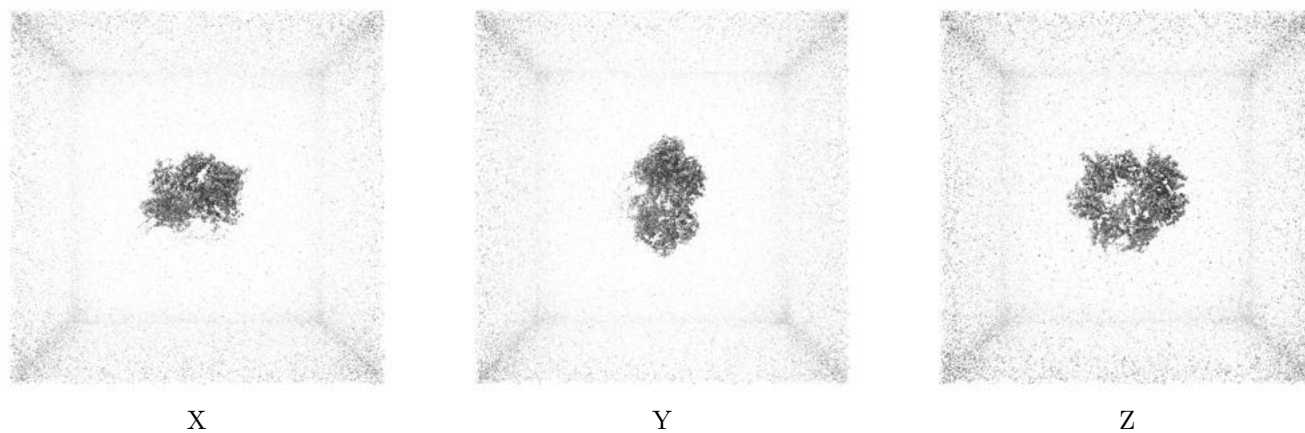
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.12. 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.

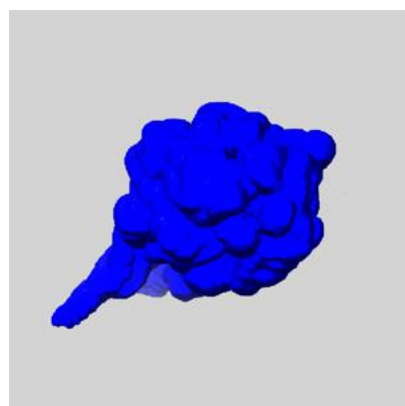
## 6.6 Mask visualisation [i](#)

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

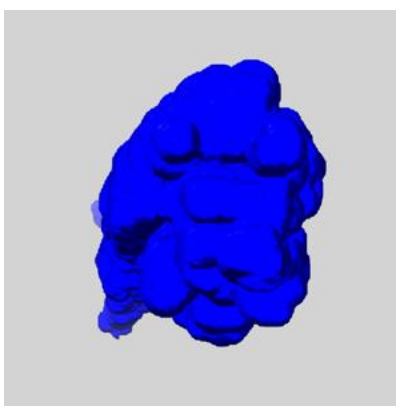
A mask typically either:

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

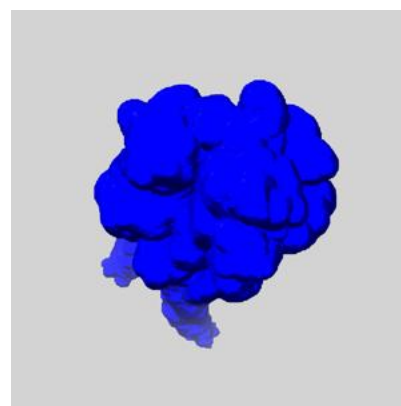
### 6.6.1 emd\_44712\_msk\_1.map [i](#)



X



Y

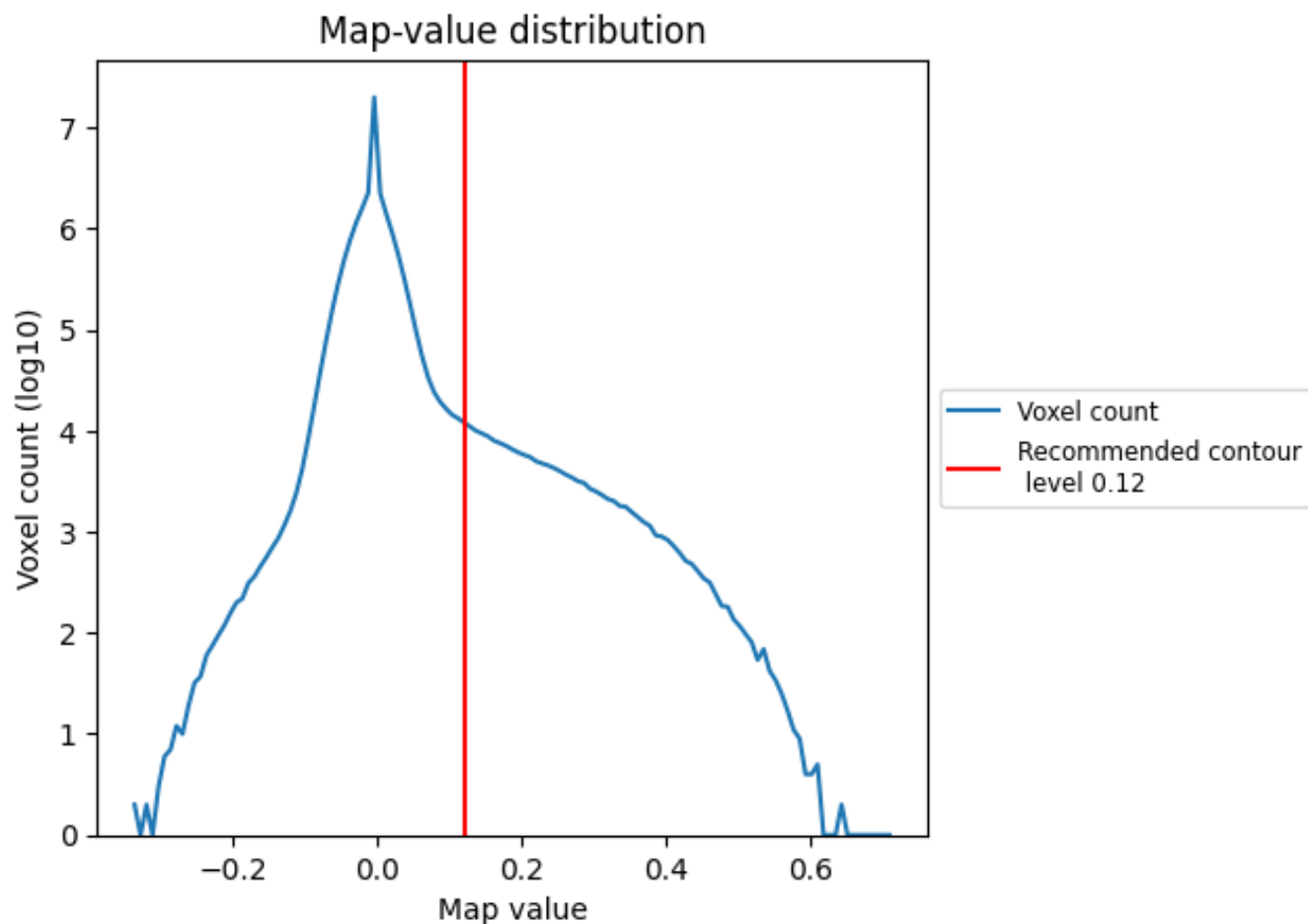


Z

## 7 Map analysis [i](#)

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

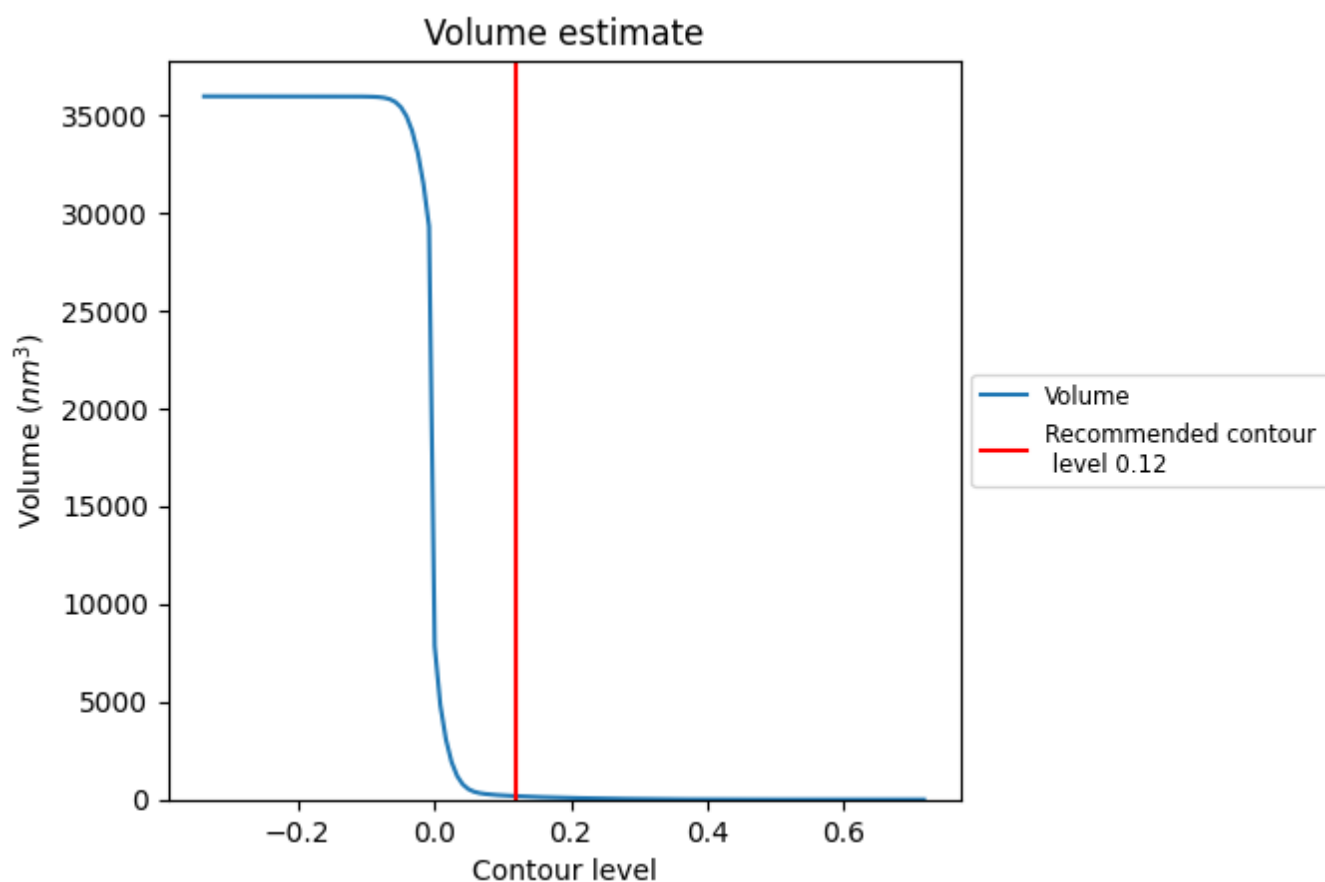
### 7.1 Map-value distribution [i](#)



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.



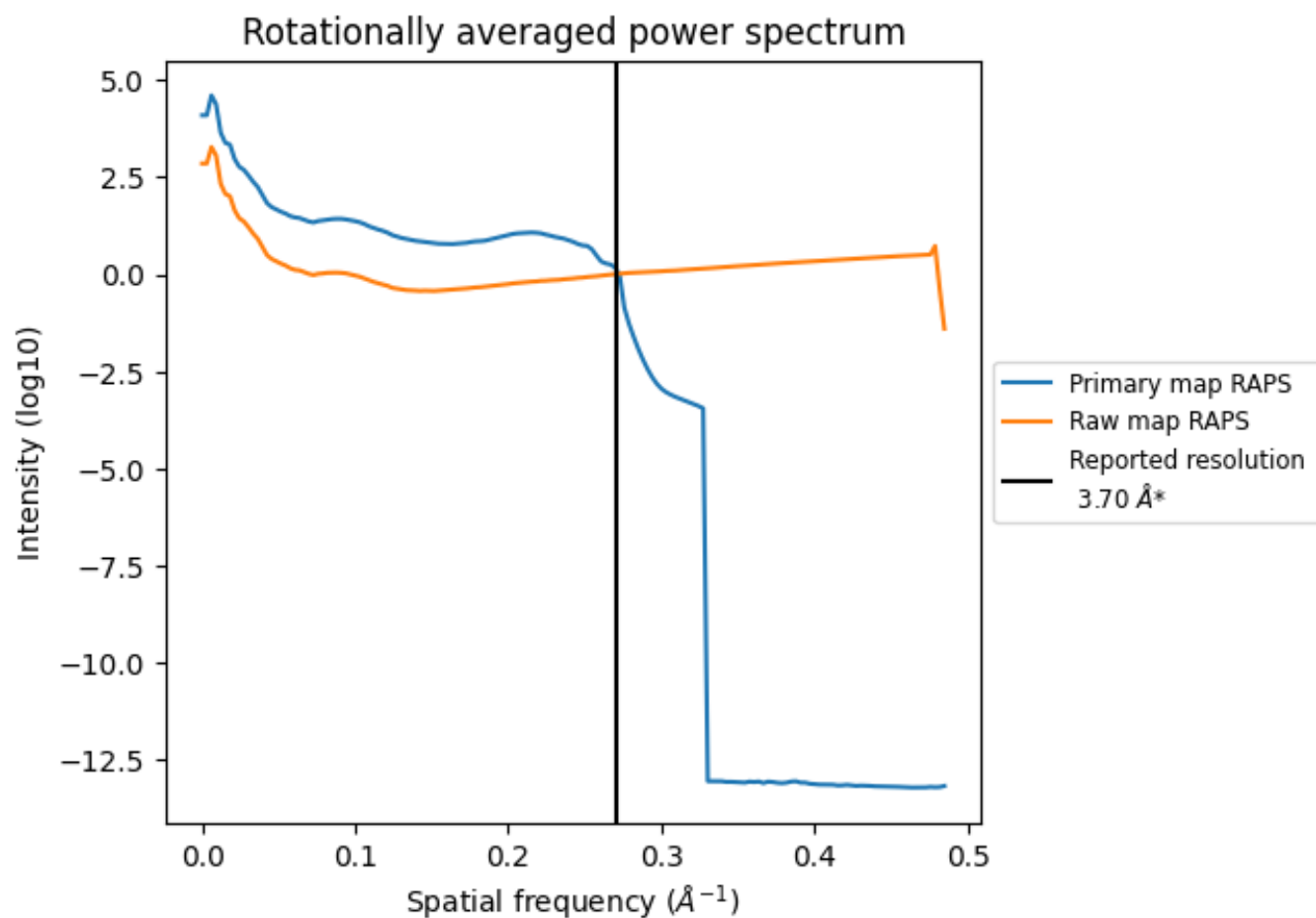
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 177 nm<sup>3</sup>; this corresponds to an approximate mass of 159 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 ⓘ

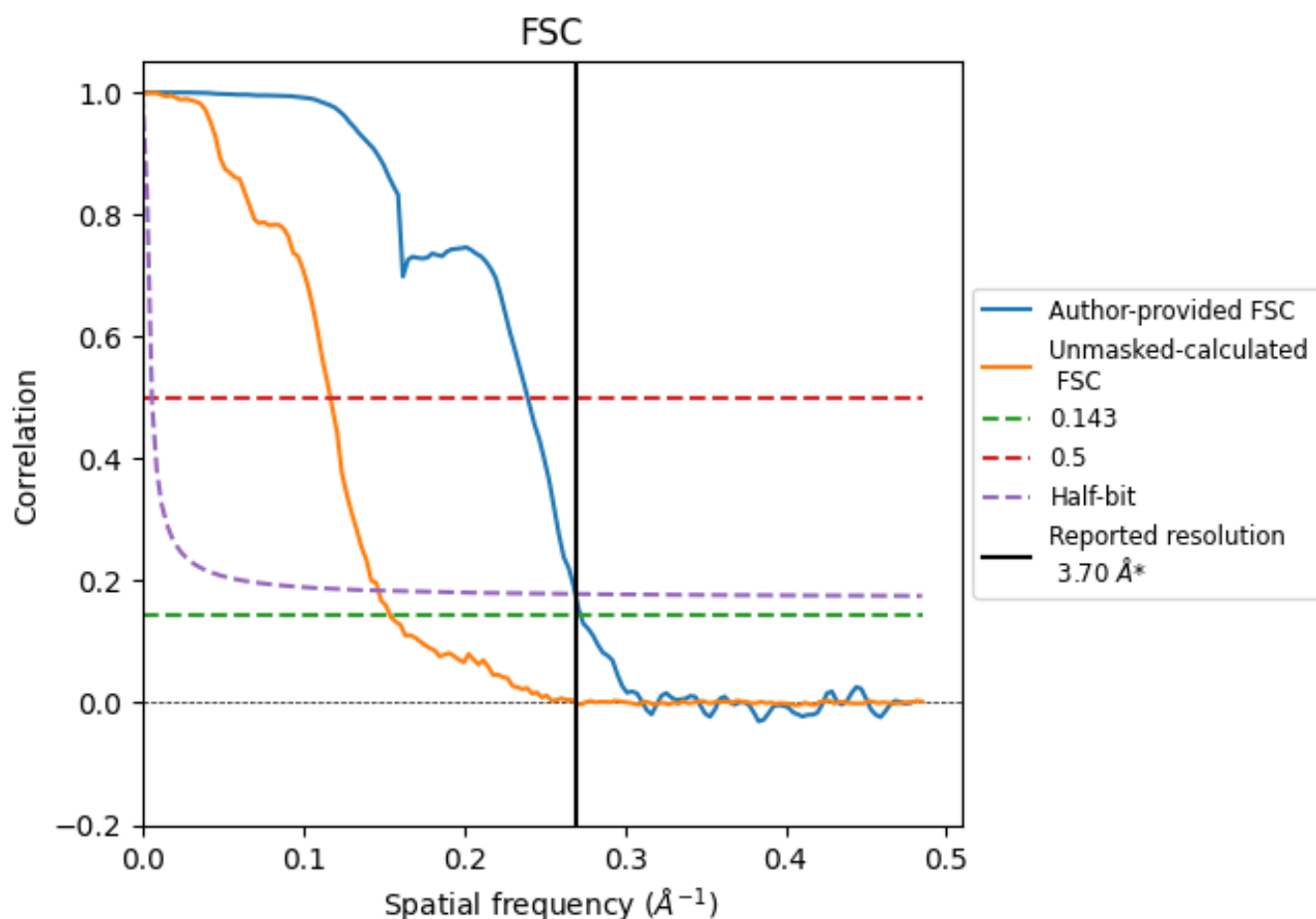


\*Reported resolution corresponds to spatial frequency of 0.270  $\text{\AA}^{-1}$

## 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 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

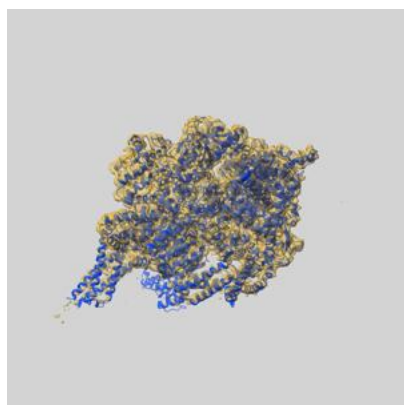
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.67	4.17	3.71
Unmasked-calculated*	6.49	8.55	6.81

\*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 6.49 differs from the reported value 3.7 by more than 10 %

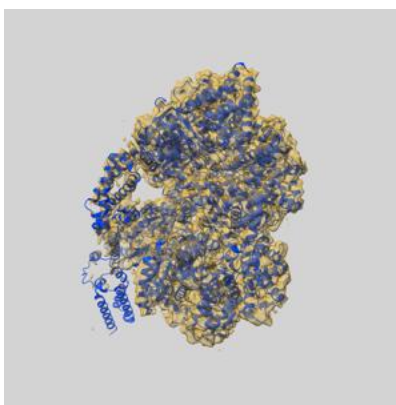
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-44712 and PDB model 9BMV. Per-residue inclusion information can be found in [section 3](#) on [page 5](#).

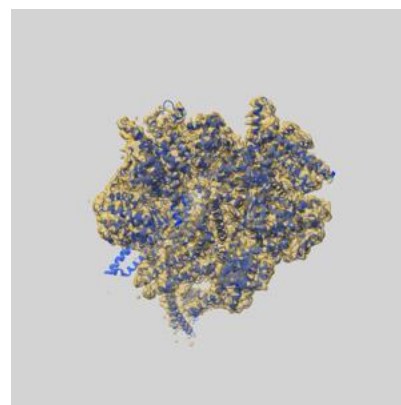
### 9.1 Map-model overlay [i](#)



X



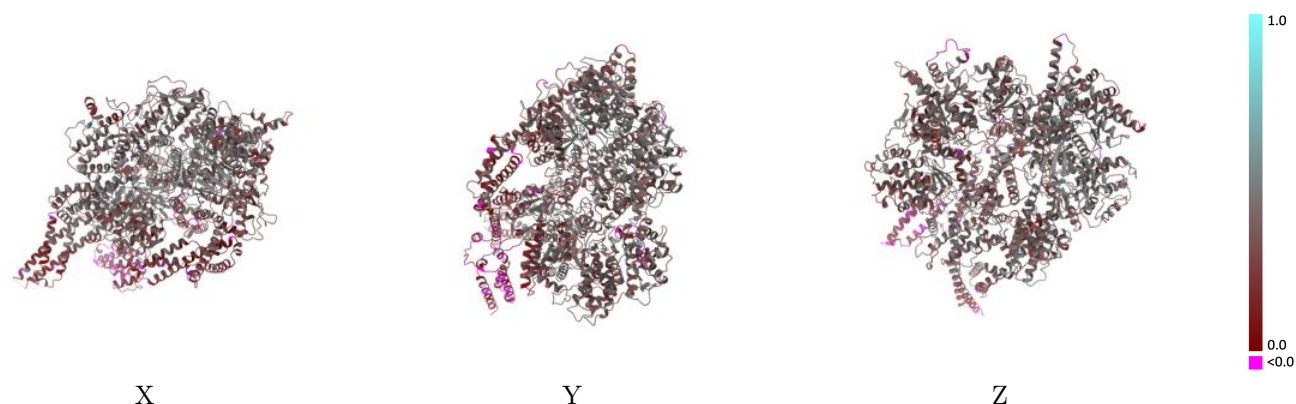
Y



Z

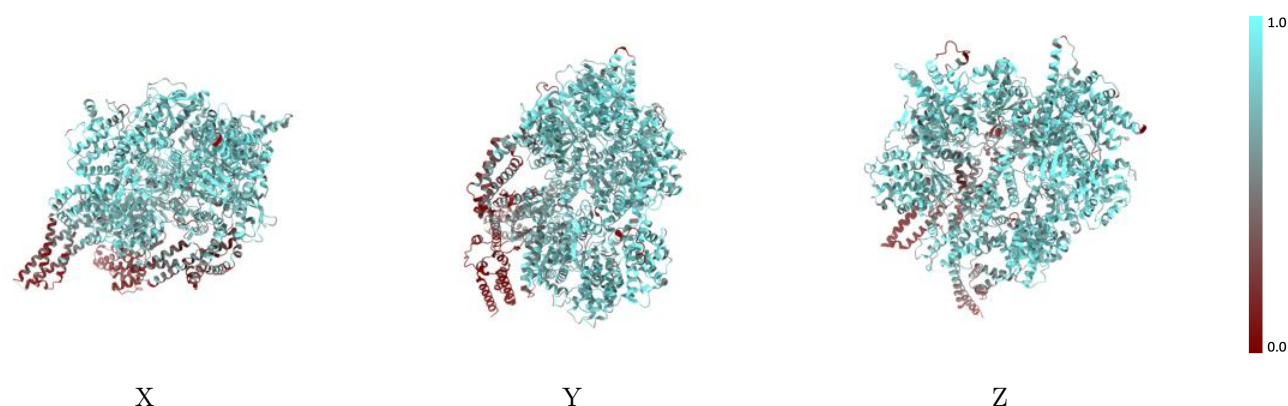
The images above show the 3D surface view of the map at the recommended contour level 0.12 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



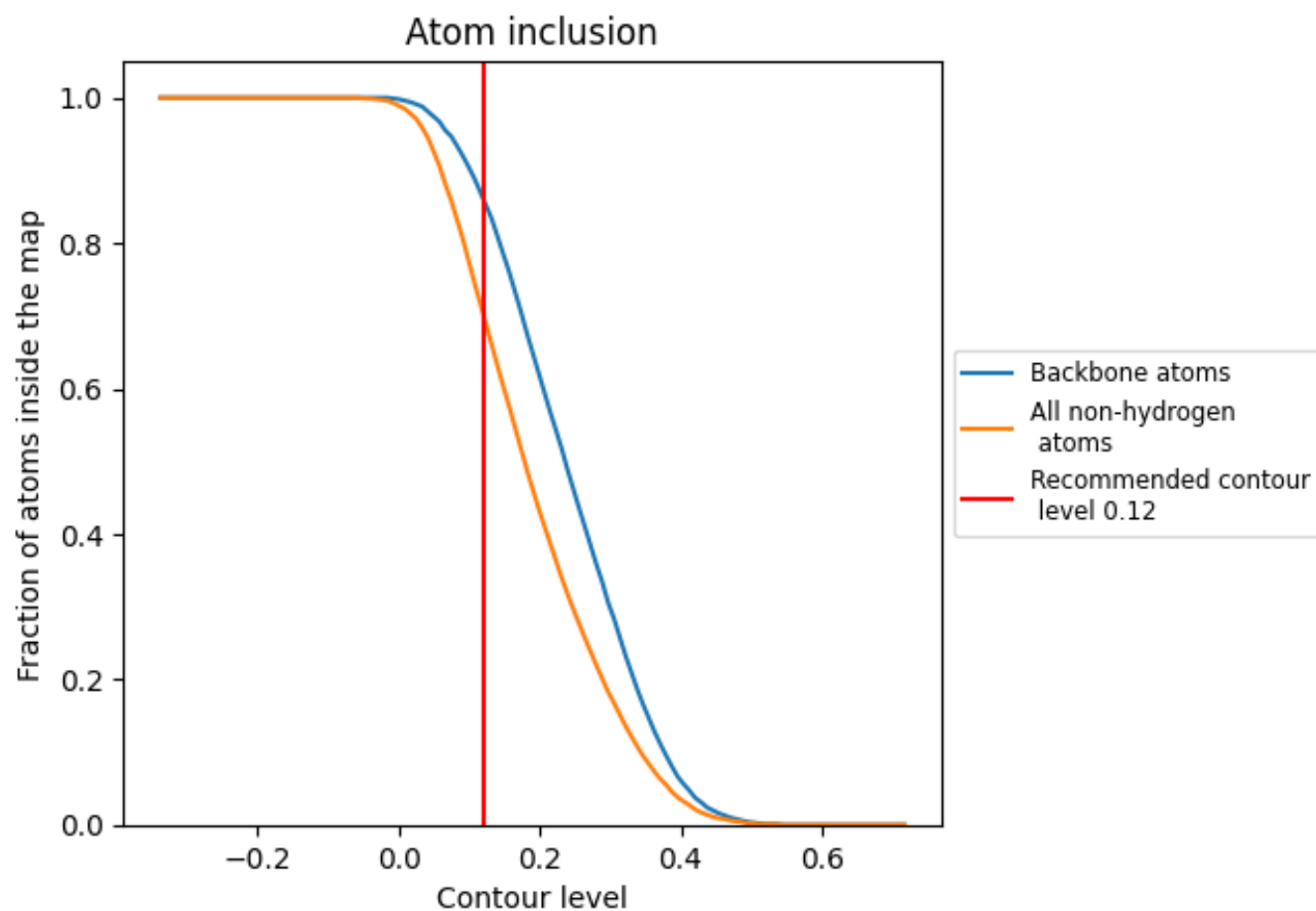
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.12).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 70% 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 (0.12) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.7030	<div></div> 0.3600
A	<div></div> 0.7030	<div></div> 0.3600

