



wwPDB EM Validation Summary Report ⓘ

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PDB ID : 9BML / pdb_00009bml
EMDB ID : EMD-44702
Title : State-2 of the motor domain from full-length human dynein-1 in 5mM AMPPNP
Authors : Chai, P.; Zhang, K.
Deposited on : 2024-05-02
Resolution : 3.30 Å(reported)

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<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
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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.dev117
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
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)	:	2.42

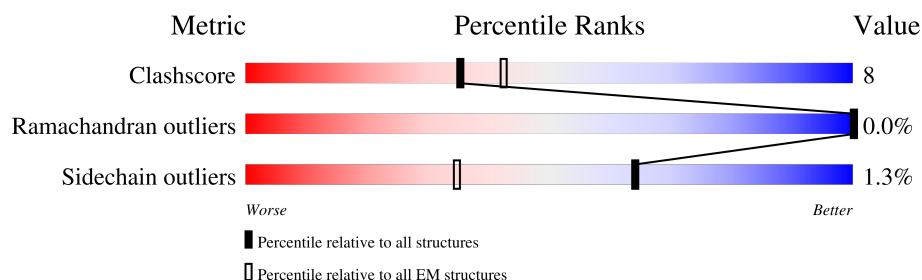
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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 23706 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	2937	23593	15028	4070	4378	117	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 1	Mg 1	0



R3561	A3460	LEU	SER	GLU	R3220	D3077	T2961	R2726	T2541	D2448	D2308	E2126
W3562	I3461	ASN	ILE	ASP	D3221	K2962	K2965	R2729	W2545	L2449	E2313	T2130
Q3563	K3462	TYR	ILE	ASP	L3222	T3081	R2966	H2730	W2548	R2450	E2316	L2131
D3570	A3463	ASP	ARG	GLU	R3223	D3096	K2967	P2731	D2566	L2452	T2326	Q2134
D3571	D3464	MET	ASN	GLU	K3224	W3097	T2968	P2732	T2571	R2453	R2332	Q2138
E3575	L3465	LYS	PHE	PRO	K3225	F3109	C2969	L2758	D2576	C2454	N2338	Q2139
M3579	A3466	ARG	ILE	ALA	S3226	M3113	E2974	M2773	V2575	S2457	F2343	S2140
L3580	A3467	VAL	THR	ILE	Q3227	D3114	D2975	V2774	R2581	L2149	E2344	Q2156
K3581	V3468	PRO	THR	ILE	Q3228	Y3125	L2976	E2775	V2582	L2157	V2346	L2158
R3582	F3469	LEU	VAL	ALA	L3229	V3129	R2977	W2802	P2580	S2159	Q2347	S2159
R3585	A3470	ARG	ASN	GLN	E3230	L3133	E2978	R2811	P2593	L2160	D2348	L2161
L3588	K3473	GLU	PHE	ASN	V3231	P3136	D2995	L2816	F2606	L2336	L2369	F2165
L3589	R3474	LEU	ALA	VAL	K3232	Q3135	E2996	P2817	L2612	N2377	Y2170	R2171
T3597	S3475	LYS	GLU	LYS	R3233	Q3137	S2997	V2818	W2615	L2382	R2172	Q2173
T3600	L3478	LEU	ILE	SER	A3234	R3140	R3001	L2822	M2616	Q2485	D2388	E2174
T3601	S3481	GLU	ASP	ILE	A3235	E3141	S3002	W2825	V2617	R2488	E2389	A2177
R3611	K3486	ALA	ALA	HIS	A3236	I3143	G3003	A2829	L2620	L2490	GLY	GLU
D3616	E3487	LYS	ARG	LEU	D3238	I3144	R3006	D2847	S2624	Y2493	ASP	GLU
D3617	R3488	ASP	GLU	VAL	K3239	V3148	K3007	H2857	D2636	L2494	ALA	GLU
L3634	F3489	GLN	MET	VAL	L3240	F3149	N3009	D2851	Q2654	V2495	GLN	K2184
V3635	E3490	LYS	LYS	ARG	K3241	T3153	R3008	R2863	R2643	A2496	ARG	E2188
Q3636	K3491	ALA	LYS	SER	K3242	K3167	R3009	E2864	Q2654	A2497	ARG	R2189
D3637	E3494	ASN	TYR	MET	VAL	I3171	R3010	R2869	L2661	L2498	LYS	Y2190
V3638	T3495	GLU	ASN	ALA	MET	I3172	Y3026	L2872	E2665	S2501	GLY	E2205
N3650	Q3499	VAL	SER	ALA	ASP	D3178	K3030	K2879	L2668	K2509	ASP	Q2209
E3652	T3502	GLN	PRO	PRO	GLN	F3179	G3036	R2890	P2669	Y2517	GLU	M2221
R3653	R3503	ILE	ASN	ALA	ALA	I3180	K3045	K2894	D2670	R2520	GLU	Q2224
R3654	T3503	TYR	TYR	VAL	GLU	A3184	S3046	T2676	T2676	I2521	GLU	Q2244
R3655	S3510	LEU	TYR	ILE	LYS	R3206	E3048	Y2901	M2686	T2522	ALA	S2231
T3656	Y3516	GLU	VAL	VAL	LYS	K3207	E3048	L2905	R2694	V2524	ALA	W2234
G3657	A3517	ALA	ASN	SER	VAL	T3211	D3045	L2909	R2694	P2527	S2410	L2244
V3660	F3520	ILE	ARG	ILE	GLN	V3212	S3046	L2909	D2697	T2528	A2419	L2244
L3661	K3524	ALA	ALA	GLY	ILE	D3213	K3047	L2920	D2697	A2529	A2420	K2257
I3662	R3525	TYR	LEU	GLY	GLN	Q3214	E3048	I2925	V2701	P2530	T2421	K2257
G3665	W3524	LYS	CYS	GLY	GLN	V3215	F3054	L2925	Q2707	M2531	I2422	V2291
D3666	R3525	E3449	GLY	GLY	LEU	E3216	K3068	L2933	F2708	E2537	M2423	R2292
Q3667	E3450	E3450	GLY	GLY	LEU	E3217	E3073	L2933	F2708	E2537	V2433	K2297
D3668	Y3451	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
D3691	R3541	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
L3692	F3543	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
C3693	R3543	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
S3694	F3544	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
R3695	T3545	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
V3696	D3546	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297
L3708	L3653	Y3451	GLY	GLY	LEU	L3218	E3073	L2933	F2708	E2537	V2433	K2297

E4630	E4631	P4632	R4633	S4634	F4635	Y4636	V4642	T4645	GLU	L4536	E4537	E4538	L4539	C4540	V4543	M4544	Q4549	G4550	A4551	T4552	V4560	Q4566	M4573	K4574	M4579	A4580	I4581	S4582	T4588	Q4589	L4590	R4591	W4592	K4594	Q4595	T4596	N4597	T4598	E4599	K4600	K4601	C4610	A4602	S4603	Y4604	V4605	T4606	L4607	P4608	V4609	T4619	F4620	T4621	V4622	D4623	F4624	E4625	I4626	T4628	K4629	V4417	K4418	L4424	R4428	Q4429	D4430	L4431	E4439	G4440	K4441	Y4447	T4450	E4454	R4462	C4472	F4482	L4489	T4492	A4496	A4497	A4501	E4502	E4503	L4504	T4507	R4508	V4509	C4510	L4511	L4514	E4518	A4519	Y4520	L4521	T4524	R4525	Q4526	Y4527	V4528	A4529	W4534	S4535	Q4347	MEI	LEU	GLU	ASP	GLU	ASP	ASP	ASP	LEU	ALA	TYR	ALA	GLU	THR	GLU	LYS	LYS	THR	ARG	THR	ASP	SER	THR	SER	ASP	GLY	ARG	P4374	A4375	A4376	M4377	A4384	L4388	I4391	L4395	S4396	H4397	L4398	K4399	R4400	T4401	V4402	E4403	N4404	I4405	K4406	D4407	P4408	L4409	F4410	R4411	F4412	F4413	E4414	R4415	E4416	V4417	K4418	L4419	L4420	L4421	L4422	L4423	L4424	L4425	L4426	L4427	L4428	L4429	L4430	L4431	L4432	L4433	L4434	L4435	L4436	L4437	L4438	L4439	L4440	L4441	L4442	L4443	L4444	L4445	L4446	L4447	L4448	L4449	L4450	L4451	L4452	L4453	L4454	L4455	L4456	L4457	L4458	L4459	L4460	L4461	L4462	L4463	L4464	L4465	L4466	L4467	L4468	L4469	L4470	L4471	L4472	L4473	L4474	L4475	L4476	L4477	L4478	L4479	L4480	L4481	L4482	L4483	L4484	L4485	L4486	L4487	L4488	L4489	L4490	L4491	L4492	L4493	L4494	L4495	L4496	L4497	L4498	L4499	L4500	L4501	L4502	L4503	L4504	L4505	L4506	L4507	L4508	L4509	L4510	L4511	L4512	L4513	L4514	L4515	L4516	L4517	L4518	L4519	L4520	L4521	L4522	L4523	L4524	L4525	L4526	L4527	L4528	L4529	L4530	L4531	L4532	L4533	L4534	L4535	L4536	L4537	L4538	L4539	L4540	L4541	L4542	L4543	L4544	L4545	L4546	L4547	L4548	L4549	L4550	L4551	L4552	L4553	L4554	L4555	L4556	L4557	L4558	L4559	L4560	L4561	L4562	L4563	L4564	L4565	L4566	L4567	L4568	L4569	L4570	L4571	L4572	L4573	L4574	L4575	L4576	L4577	L4578	L4579	L4580	L4581	L4582	L4583	L4584	L4585	L4586	L4587	L4588	L4589	L4590	L4591	L4592	L4593	L4594	L4595	L4596	L4597	L4598	L4599	L4600	L4601	L4602	L4603	L4604	L4605	L4606	L4607	L4608	L4609	L4610	L4611	L4612	L4613	L4614	L4615	L4616	L4617	L4618	L4619	L4620	L4621	L4622	L4623	L4624	L4625	L4626	L4627	L4628	L4629	L4630	L4631	L4632	L4633	L4634	L4635	L4636	L4637	L4638	L4639	L4640	L4641	L4642	L4643	L4644	L4645	L4646	L4647	L4648	L4649	L4650	L4651	L4652	L4653	L4654	L4655	L4656	L4657	L4658	L4659	L4660	L4661	L4662	L4663	L4664	L4665	L4666	L4667	L4668	L4669	L4670	L4671	L4672	L4673	L4674	L4675	L4676	L4677	L4678	L4679	L4680	L4681	L4682	L4683	L4684	L4685	L4686	L4687	L4688	L4689	L4690	L4691	L4692	L4693	L4694	L4695	L4696	L4697	L4698	L4699	L4700	L4701	L4702	L4703	L4704	L4705	L4706	L4707	L4708	L4709	L4710	L4711	L4712	L4713	L4714	L4715	L4716	L4717	L4718	L4719	L4720	L4721	L4722	L4723	L4724	L4725	L4726	L4727	L4728	L4729	L4730	L4731	L4732	L4733	L4734	L4735	L4736	L4737	L4738	L4739	L4740	L4741	L4742	L4743	L4744	L4745	L4746	L4747	L4748	L4749	L4750	L4751	L4752	L4753	L4754	L4755	L4756	L4757	L4758	L4759	L4760	L4761	L4762	L4763	L4764	L4765	L4766	L4767	L4768	L4769	L4770	L4771	L4772	L4773	L4774	L4775	L4776	L4777	L4778	L4779	L4780	L4781	L4782	L4783	L4784	L4785	L4786	L4787	L4788	L4789	L4790	L4791	L4792	L4793	L4794	L4795	L4796	L4797	L4798	L4799	L4800	L4801	L4802	L4803	L4804	L4805	L4806	L4807	L4808	L4809	L4810	L4811	L4812	L4813	L4814	L4815	L4816	L4817	L4818	L4819	L4820	L4821	L4822	L4823	L4824	L4825	L4826	L4827	L4828	L4829	L4830	L4831	L4832	L4833	L4834	L4835	L4836	L4837	L4838	L4839	L4840	L4841	L4842	L4843	L4844	L4845	L4846	L4847	L4848	L4849	L4850	L4851	L4852	L4853	L4854	L4855	L4856	L4857	L4858	L4859	L4860	L4861	L4862	L4863	L4864	L4865	L4866	L4867	L4868	L4869	L4870	L4871	L4872	L4873	L4874	L4875	L4876	L4877	L4878	L4879	L4880	L4881	L4882	L4883	L4884	L4885	L4886	L4887	L4888	L4889	L4890	L4891	L4892	L4893	L4894	L4895	L4896	L4897	L4898	L4899	L4900	L4901	L4902	L4903	L4904	L4905	L4906	L4907	L4908	L4909	L4910	L4911	L4912	L4913	L4914	L4915	L4916	L4917	L4918	L4919	L4920	L4921	L4922	L4923	L4924	L4925	L4926	L4927	L4928	L4929	L4930	L4931	L4932	L4933	L4934	L4935	L4936	L4937	L4938	L4939	L4940	L4941	L4942	L4943	L4944	L4945	L4946	L4947	L4948	L4949	L4950	L4951	L4952	L4953	L4954	L4955	L4956	L4957	L4958	L4959	L4960	L4961	L4962	L4963	L4964	L4965	L4966	L4967	L4968	L4969	L4970	L4971	L4972	L4973	L4974	L4975	L4976	L4977	L4978	L4979	L4980	L4981	L4982	L4983	L4984	L4985	L4986	L4987	L4988	L4989	L4990	L4991	L4992	L4993	L4994	L4995	L4996	L4997	L4998	L4999	L5000	L5001	L5002	L5003	L5004	L5005	L5006	L5007	L5008	L5009	L5010	L5011	L5012	L5013	L5014	L5015	L5016	L5017	L5018	L5019	L5020	L5021	L5022	L5023	L5024	L5025	L5026	L5027	L5028	L5029	L5030	L5031	L5032	L5033	L5034	L5035	L5036	L5037	L5038	L5039	L5040	L5041	L5042	L5043	L5044	L5045	L5046	L5047	L5048	L5049	L5050	L5051	L5052	L5053	L5054	L5055	L5056	L5057	L5058	L5059	L5060	L5061	L5062	L5063	L5064	L5065	L5066	L5067	L5068	L5069	L5070	L5071	L5072	L5073	L5074	L5075	L5076	L5077	L5078	L5079	L5080	L5081	L5082	L5083	L5084	L5085	L5086	L5087	L5088	L5089	L5090	L5091	L5092	L5093	L5094	L5095	L5096	L5097	L5098	L509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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	40850	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	1.898	Depositor
Minimum map value	-1.110	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.058	Depositor
Recommended contour level	0.3	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: 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	0.26	0/24093	0.48	2/32651 (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 (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1638	LEU	CA-CB-CG	5.50	127.95	115.30
1	A	3788	ASP	CB-CG-OD2	5.26	123.03	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	4633	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	23593	0	23658	363	0
2	A	81	0	36	3	0
3	A	31	0	12	0	0
4	A	1	0	0	0	0
All	All	23706	0	23706	363	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.

The worst 5 of 363 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:4574:LYS:HB3	1:A:4627:ALA:HB2	1.46	0.98
1:A:1480:TYR:HB2	1:A:1486:LEU:HD11	1.57	0.85
1:A:1526:LYS:HA	1:A:1529:ARG:HD3	1.62	0.82
1:A:2221:MET:HG2	1:A:2343:PHE:HB2	1.66	0.77
1:A:4260:PHE:HD1	1:A:4263:ARG:HH21	1.31	0.77

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	2929/4646 (63%)	2888 (99%)	40 (1%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2530	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	2605/4125 (63%)	2572 (99%)	33 (1%)	65 79

5 of 33 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4413	PHE
1	A	4502	LYS
1	A	4573	ASN
1	A	2531	ASN
1	A	2522	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1653	HIS
1	A	1989	ASN
1	A	2752	ASN
1	A	3233	ASN
1	A	3237	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

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
2	ADP	A	4701	-	24,29,29	0.73	0	29,45,45	0.74	1 (3%)
3	ATP	A	4702	4	28,33,33	0.68	0	34,52,52	0.60	1 (2%)
2	ADP	A	4704	-	24,29,29	0.89	0	29,45,45	1.18	2 (6%)
2	ADP	A	4703	-	24,29,29	0.89	0	29,45,45	1.21	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	ADP	A	4701	-	-	2/12/32/32	0/3/3/3
3	ATP	A	4702	4	-	4/18/38/38	0/3/3/3
2	ADP	A	4704	-	-	1/12/32/32	0/3/3/3
2	ADP	A	4703	-	-	2/12/32/32	0/3/3/3

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	4703	ADP	N3-C2-N1	-3.70	123.65	128.67
2	A	4704	ADP	N3-C2-N1	-3.62	123.76	128.67
2	A	4704	ADP	C4-C5-N7	-2.50	106.69	109.34
2	A	4703	ADP	C4-C5-N7	-2.44	106.76	109.34
3	A	4702	ATP	C5-C6-N6	2.33	123.86	120.31

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

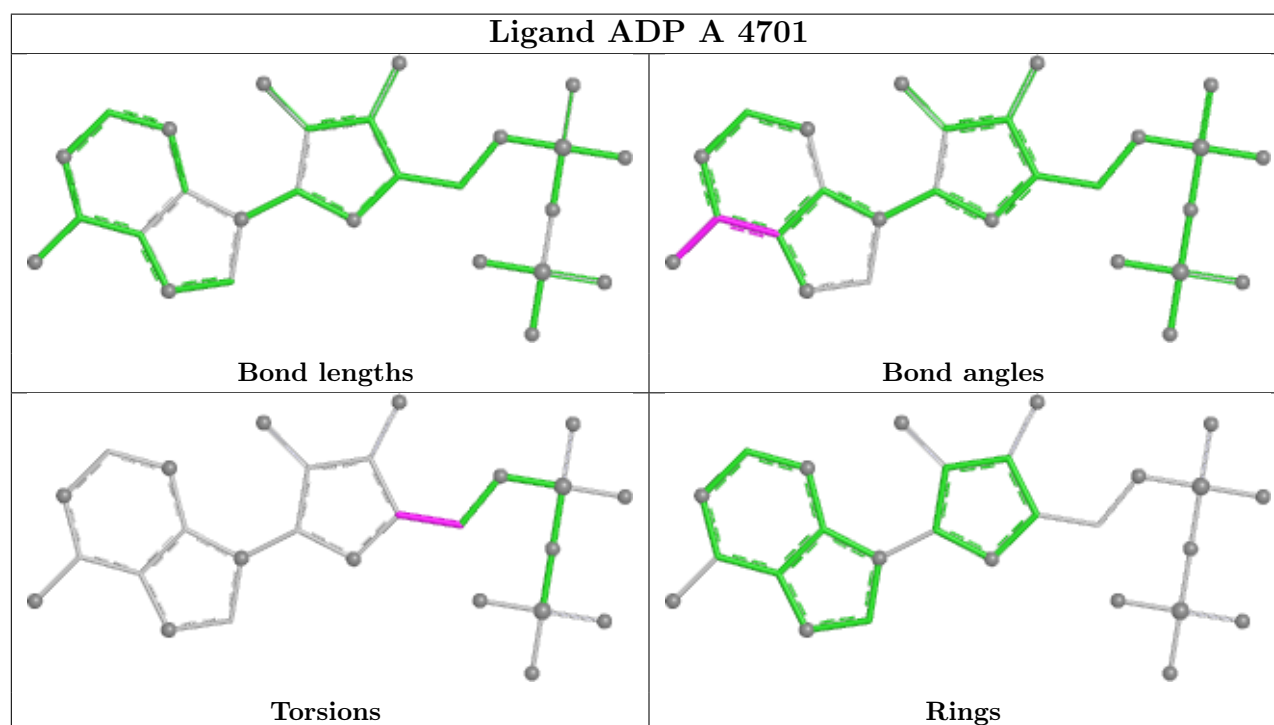
Mol	Chain	Res	Type	Atoms
3	A	4702	ATP	O4'-C4'-C5'-O5'
2	A	4701	ADP	O4'-C4'-C5'-O5'
3	A	4702	ATP	C3'-C4'-C5'-O5'
3	A	4702	ATP	PA-O3A-PB-O2B
2	A	4704	ADP	C5'-O5'-PA-O1A

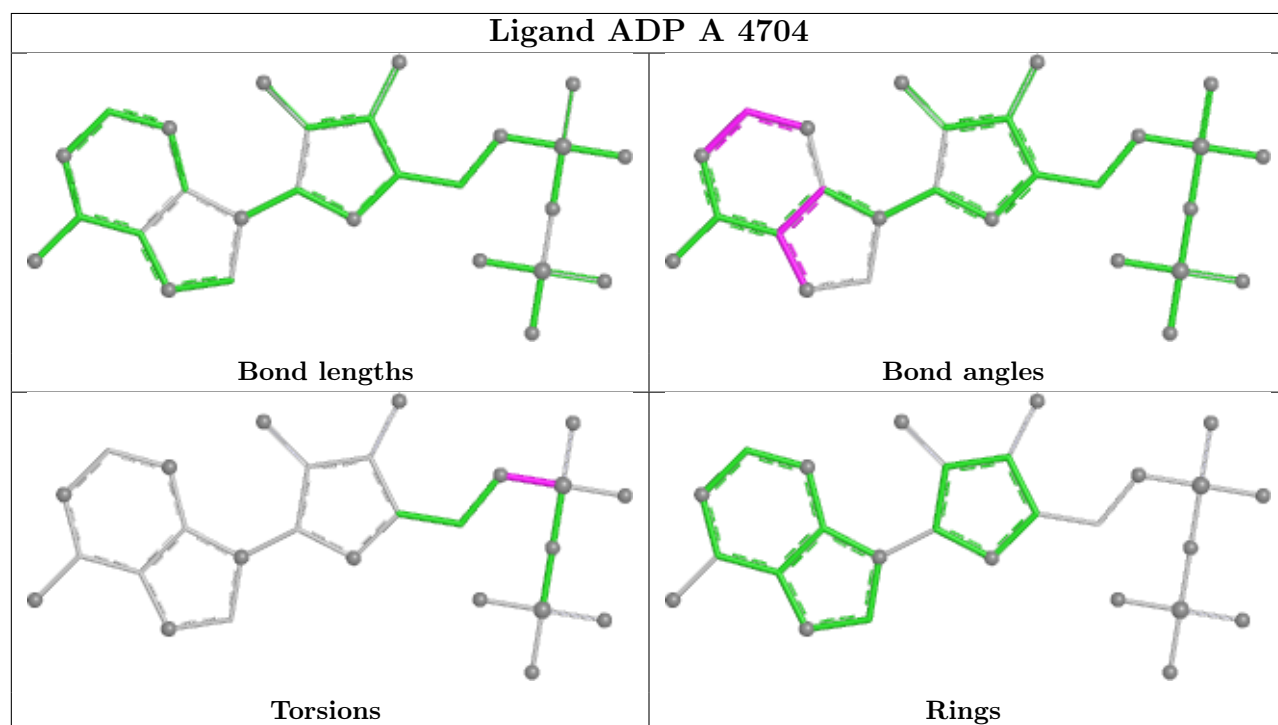
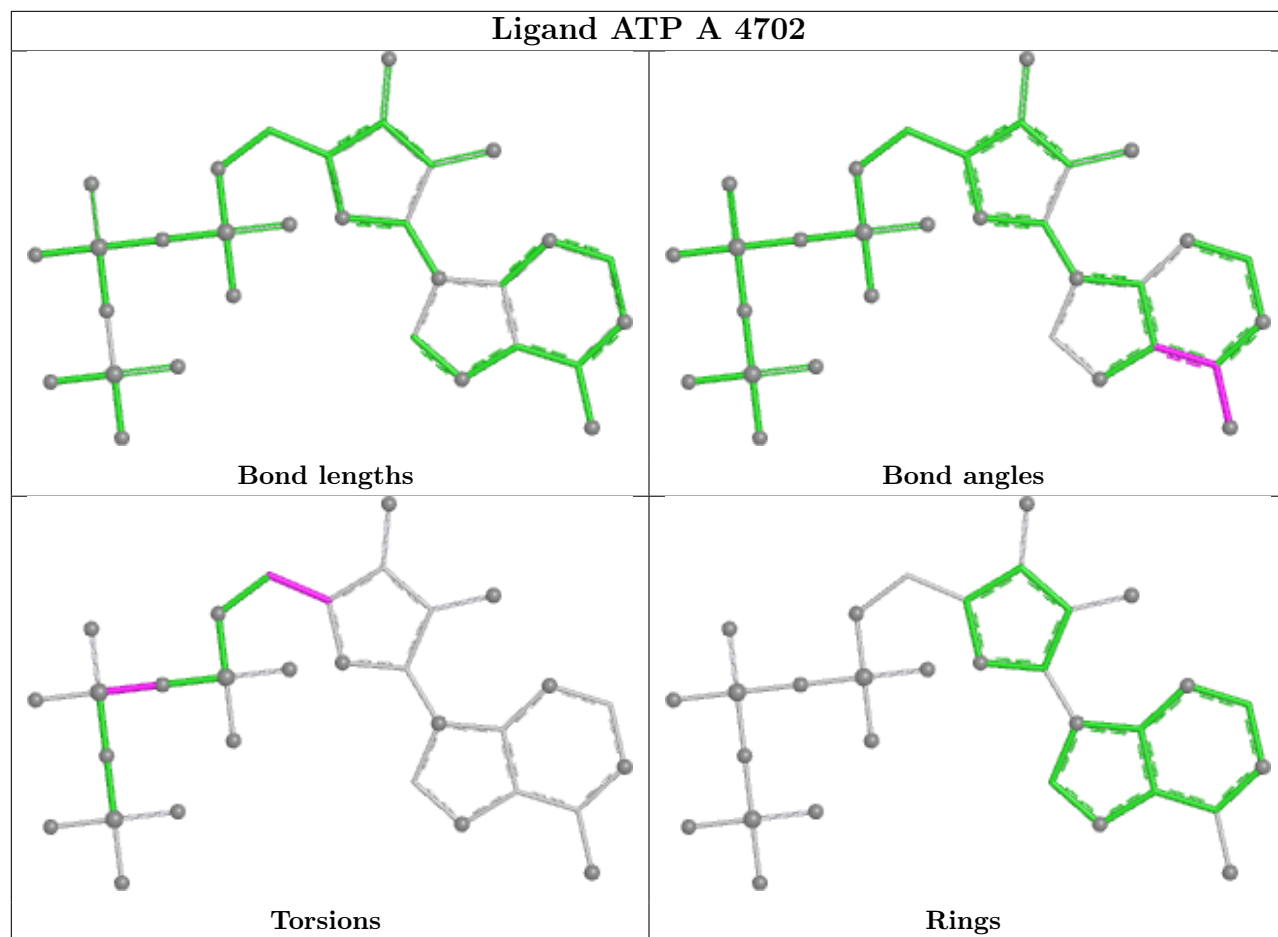
There are no ring outliers.

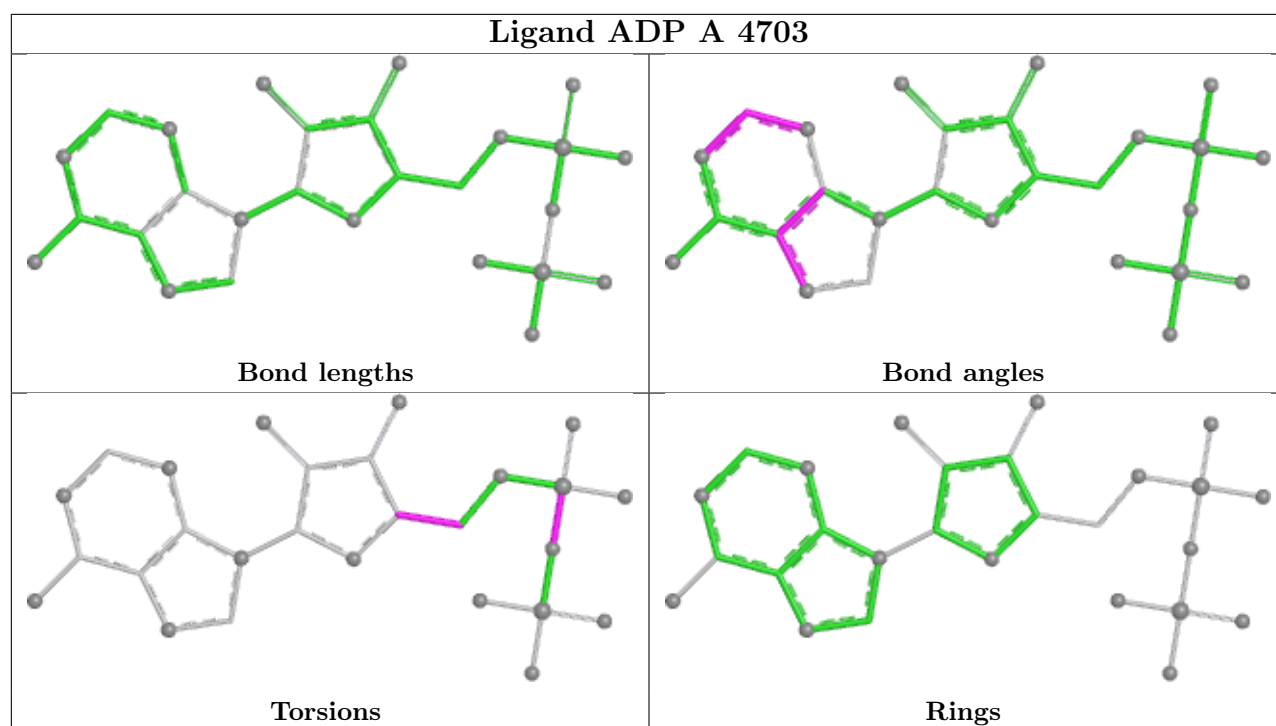
1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

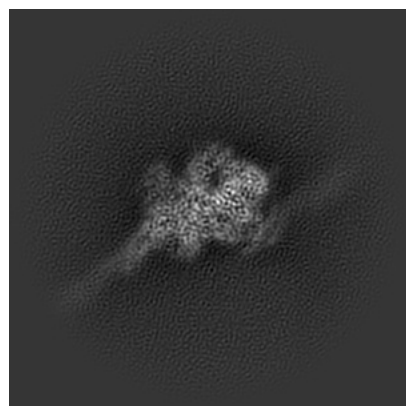
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44702. These allow visual inspection of the internal detail of the map and identification of artifacts.

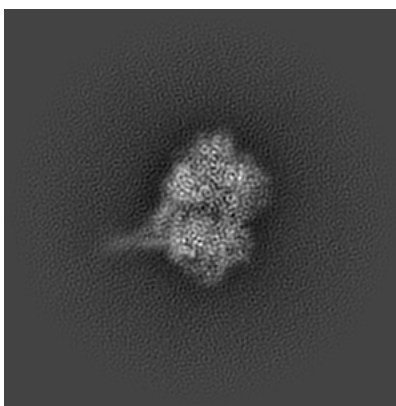
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

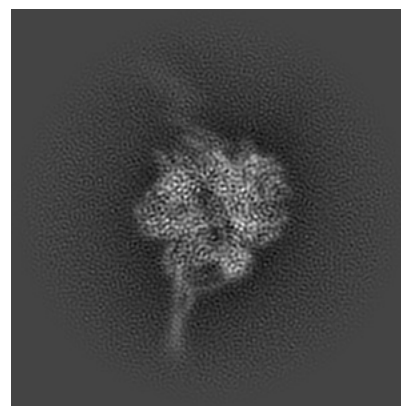
6.1.1 Primary map



X

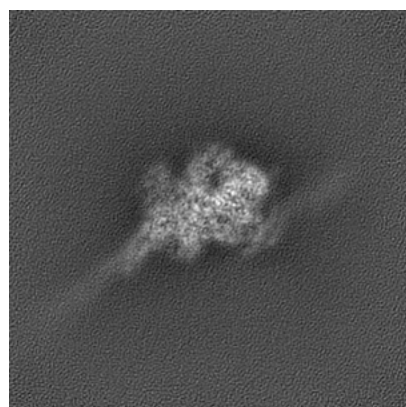


Y

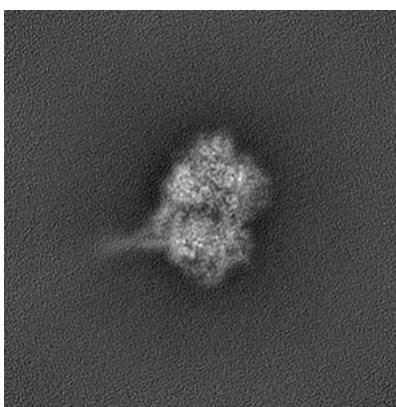


Z

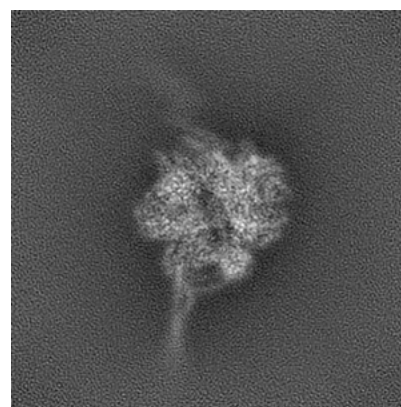
6.1.2 Raw map



X



Y

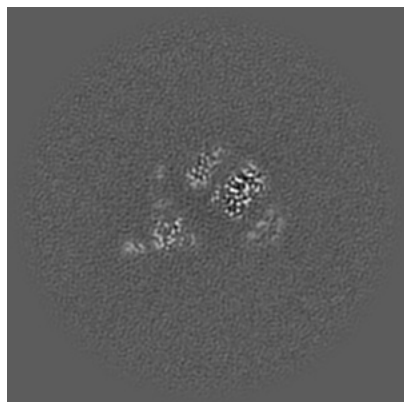


Z

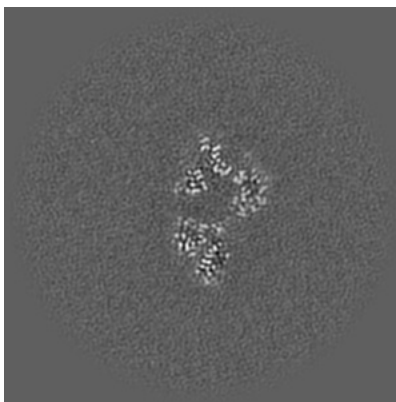
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

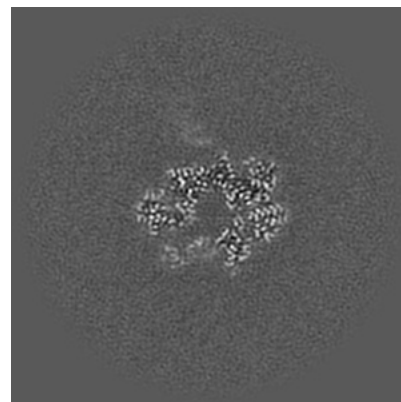
6.2.1 Primary map



X Index: 128

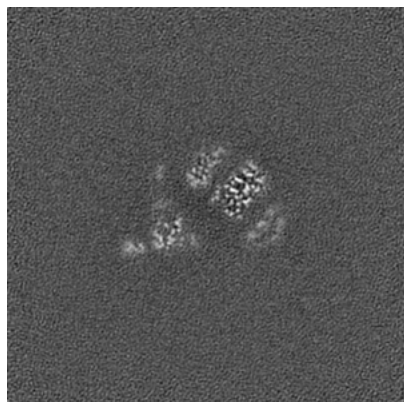


Y Index: 128

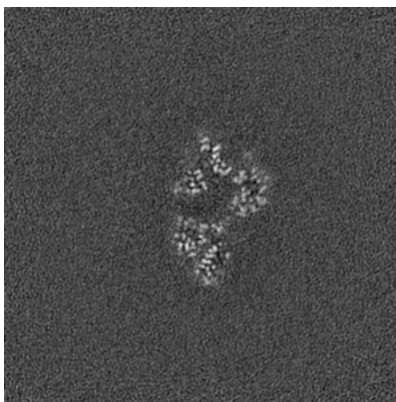


Z Index: 128

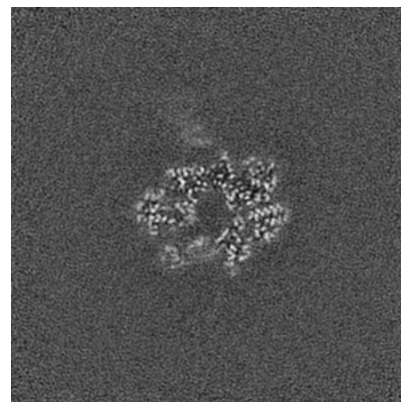
6.2.2 Raw map



X Index: 128



Y Index: 128

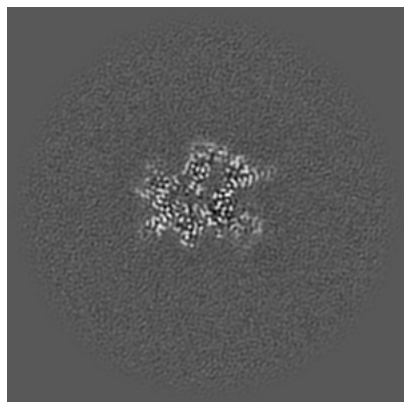


Z Index: 128

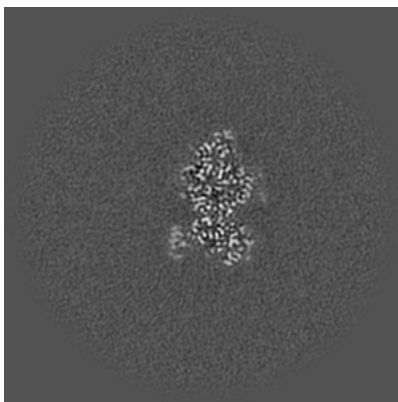
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

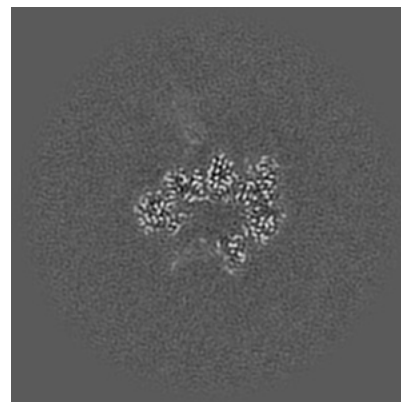
6.3.1 Primary map



X Index: 146

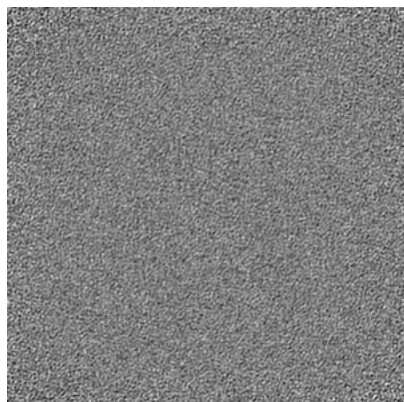


Y Index: 143

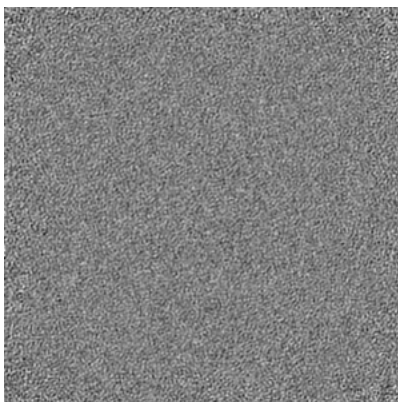


Z Index: 131

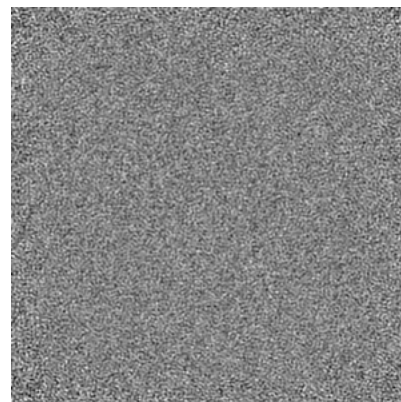
6.3.2 Raw map



X Index: 0



Y Index: 0

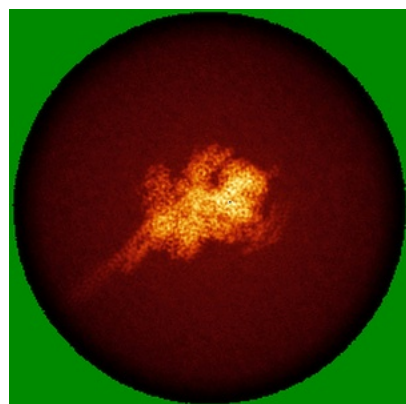


Z Index: 0

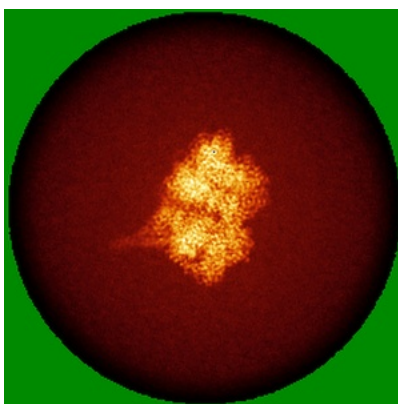
The images above show the largest variance slices of the map in three orthogonal directions.

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

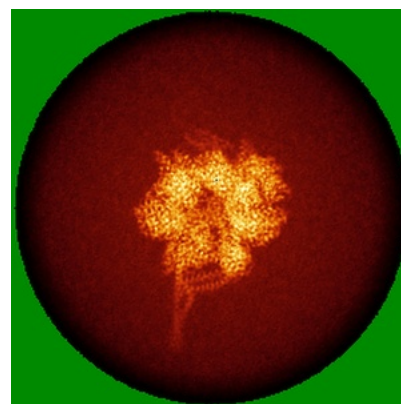
6.4.1 Primary map



X

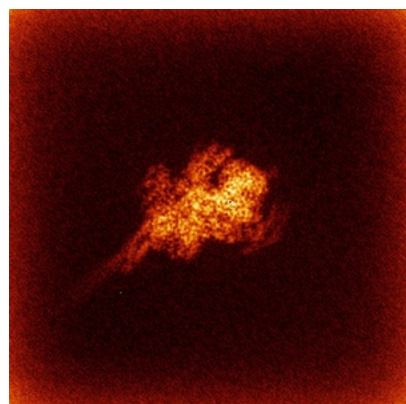


Y

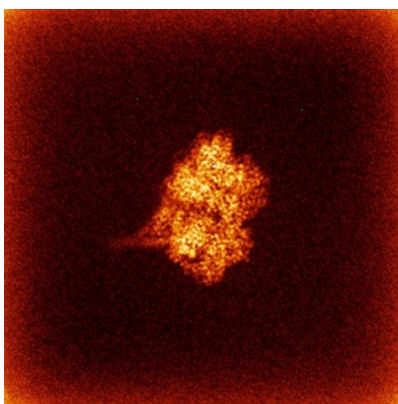


Z

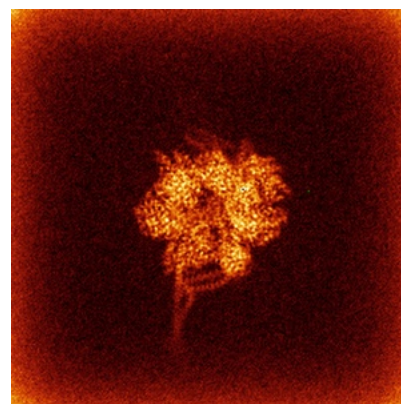
6.4.2 Raw map



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.

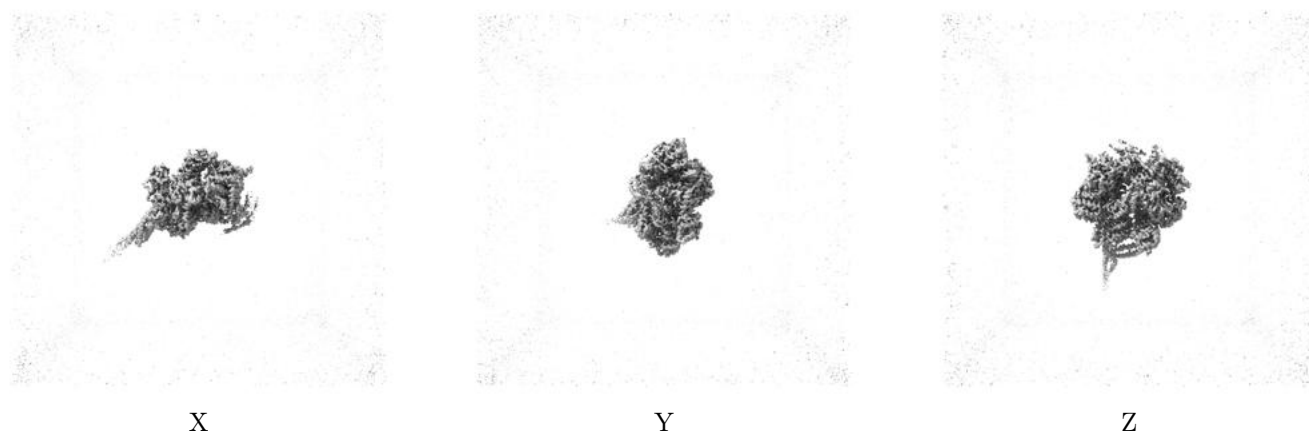
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.3. 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.

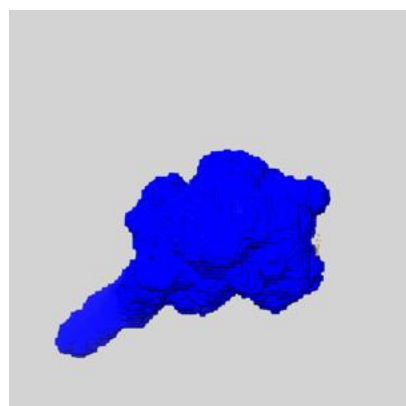
6.6 Mask visualisation [i](#)

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

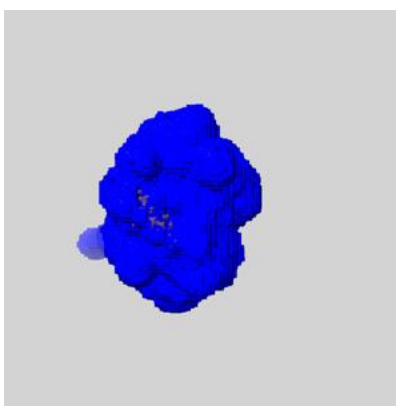
A mask typically either:

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

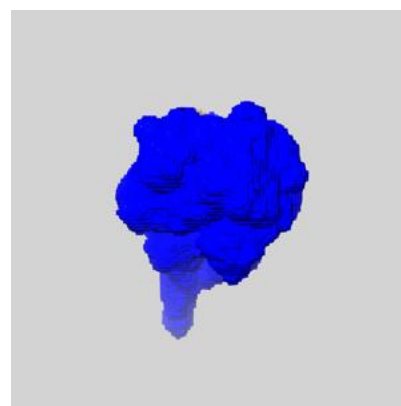
6.6.1 emd_44702_msk_1.map [i](#)



X



Y

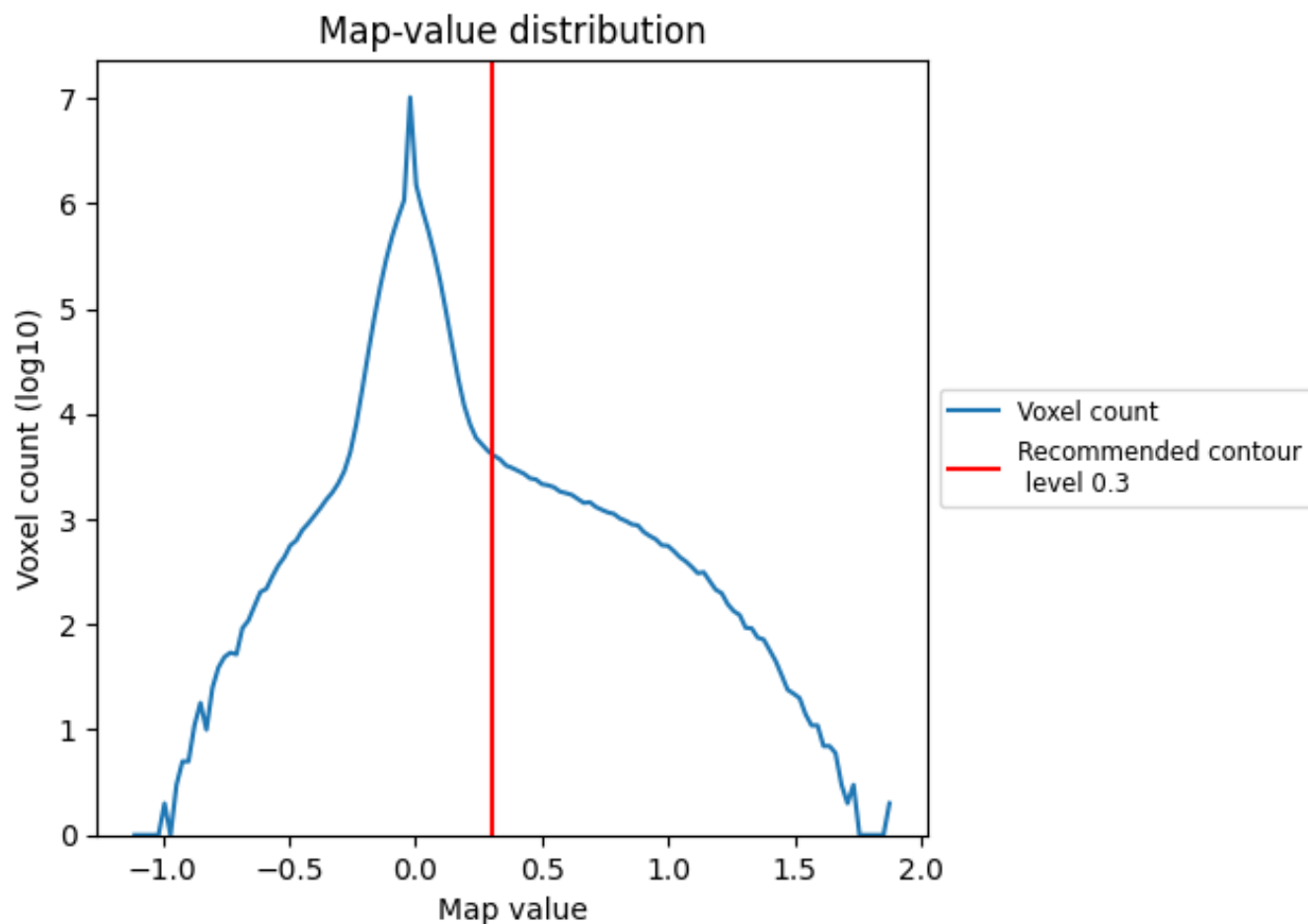


Z

7 Map analysis [i](#)

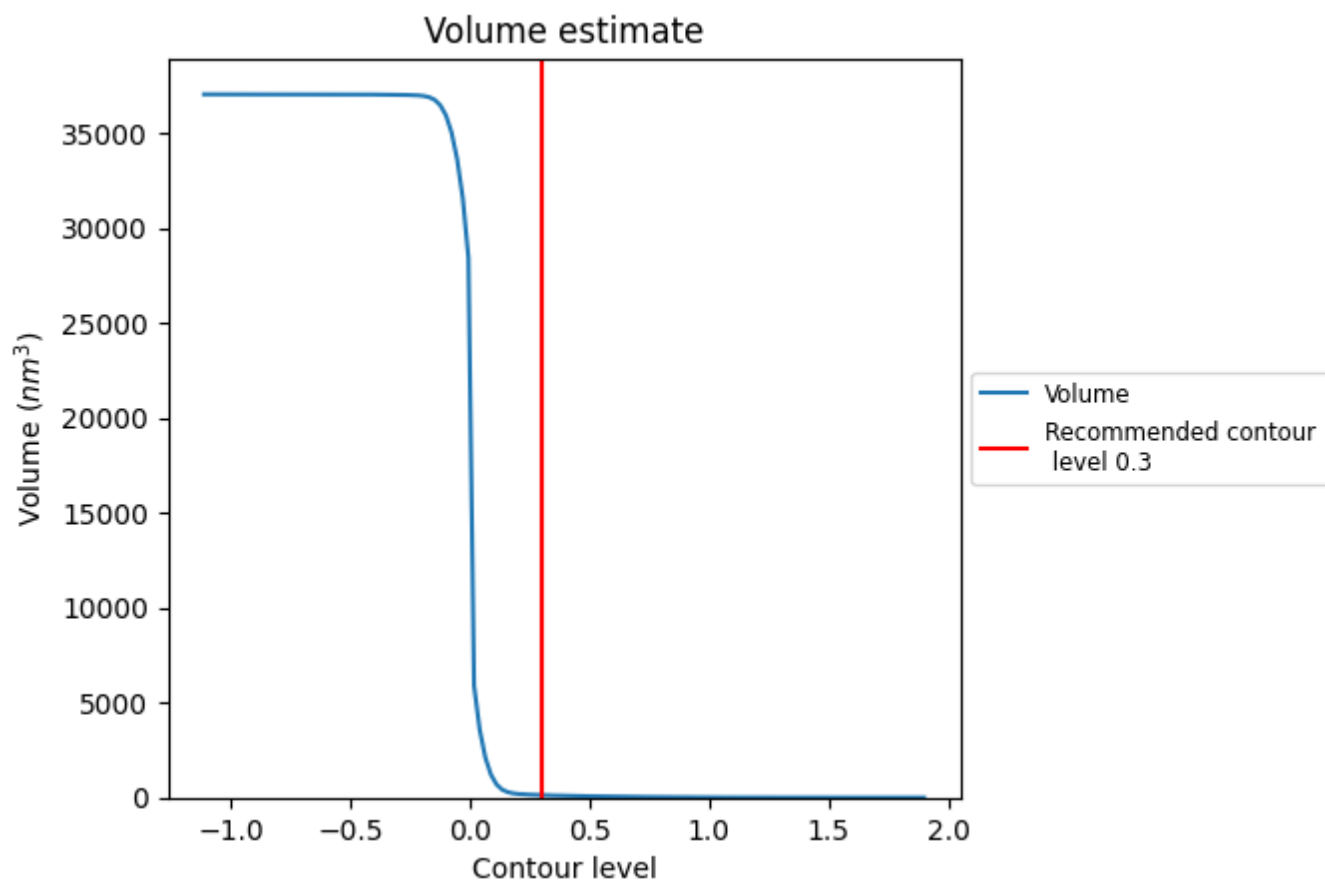
This section contains the results of statistical analysis of the map.

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.

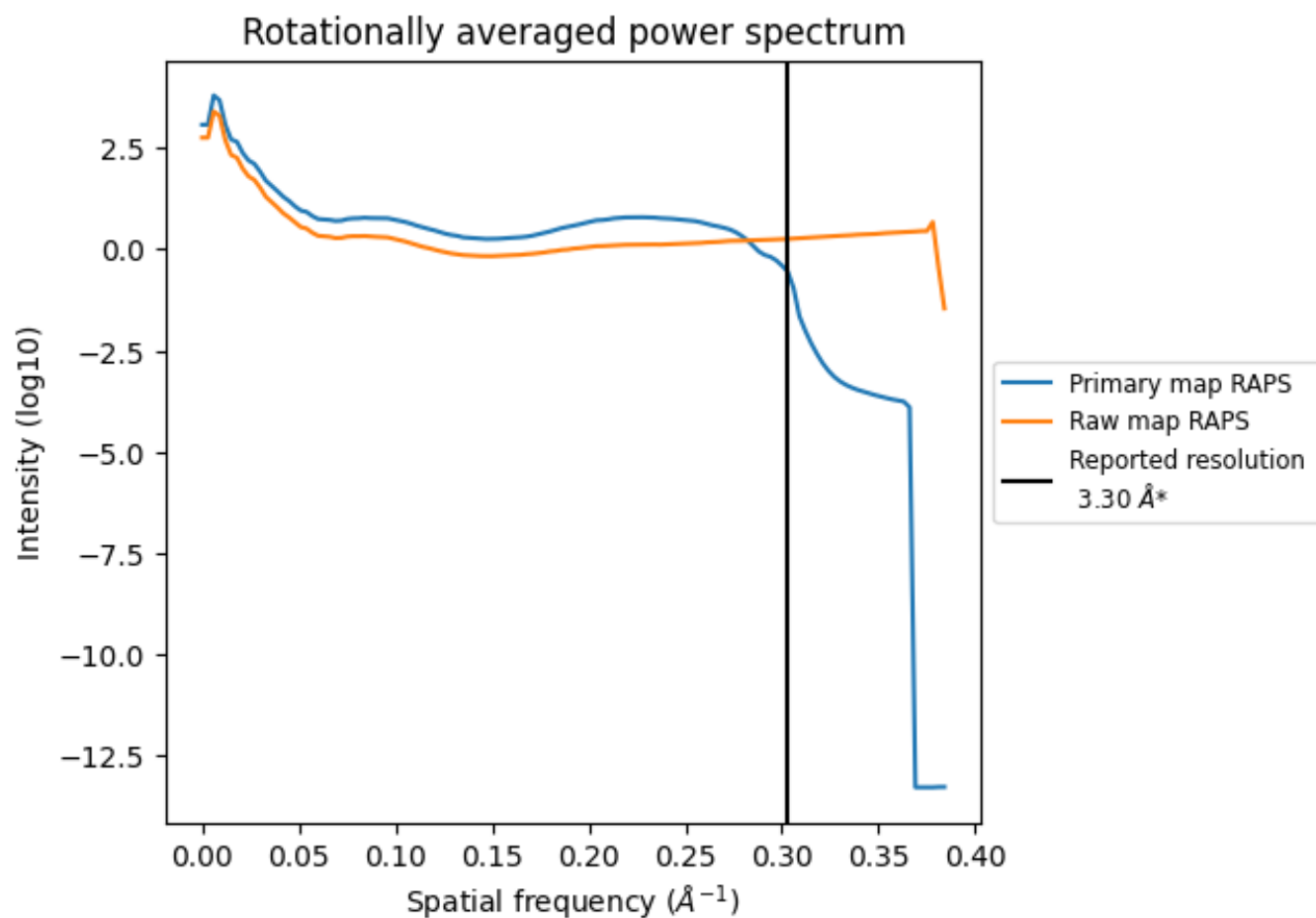
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 128 nm³; this corresponds to an approximate mass of 116 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 ⓘ

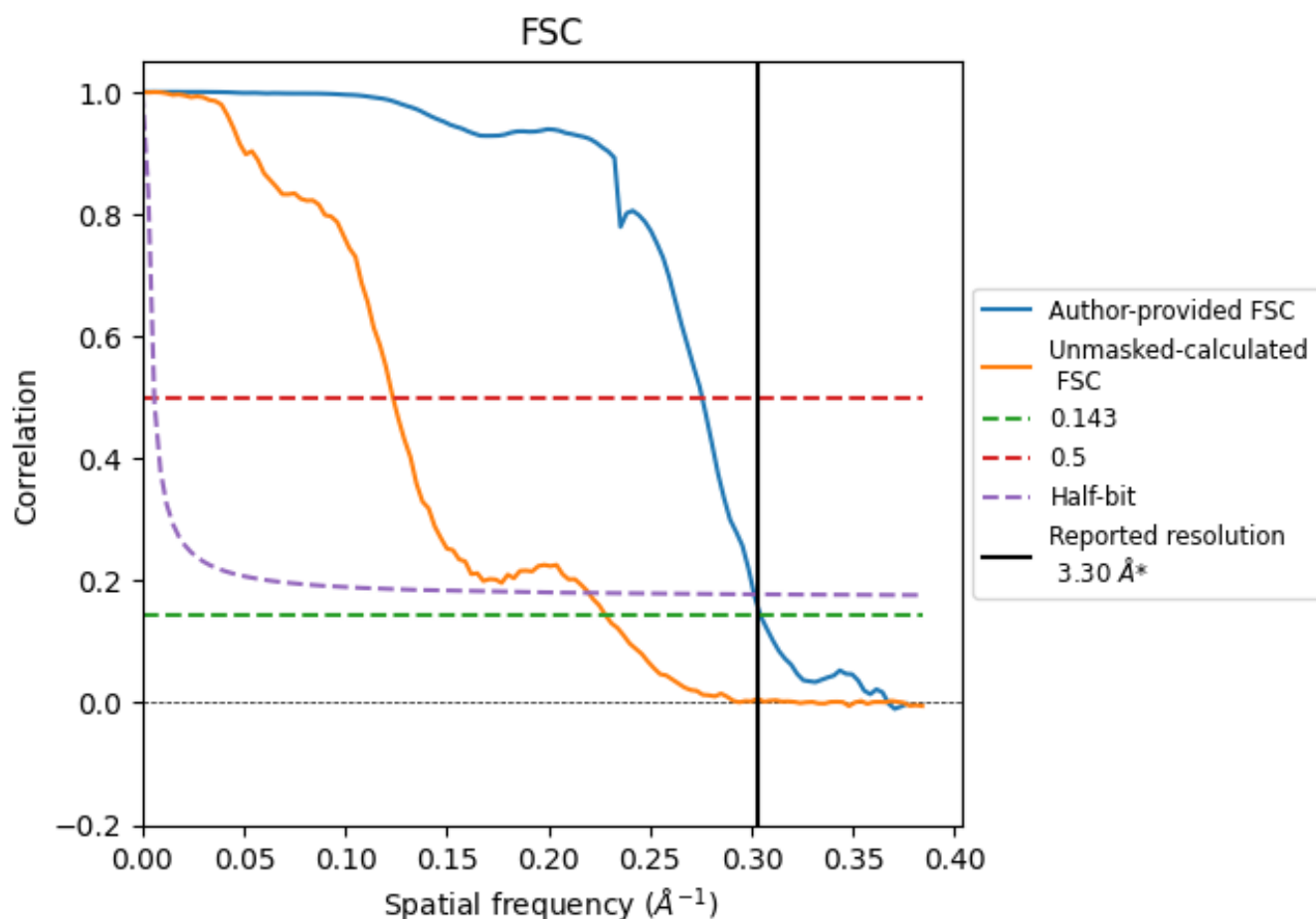


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

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 0.303 \AA^{-1}

8.2 Resolution estimates [i](#)

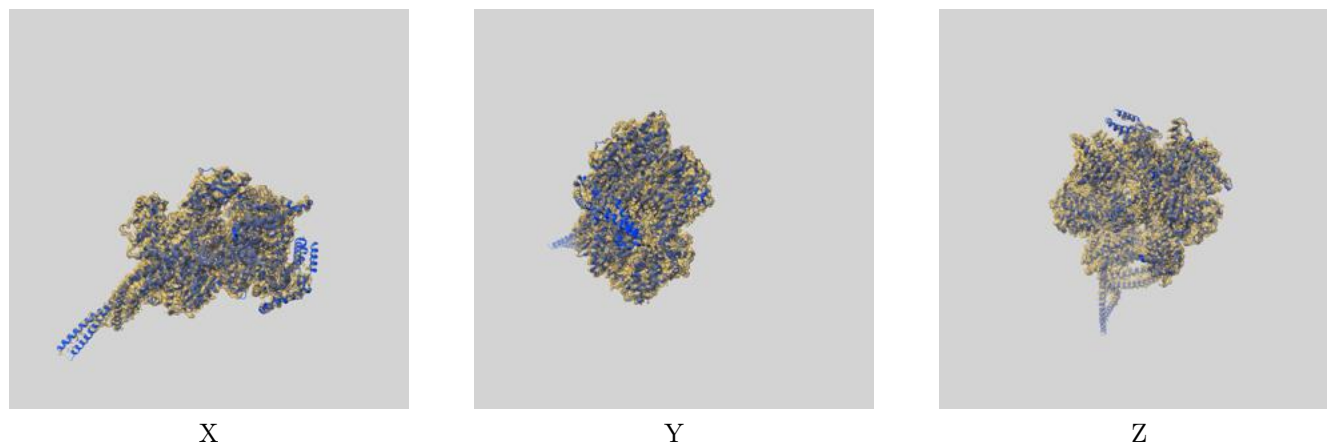
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	3.29	3.63	3.32
Unmasked-calculated*	4.38	8.10	4.55

*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 4.38 differs from the reported value 3.3 by more than 10 %

9 Map-model fit [i](#)

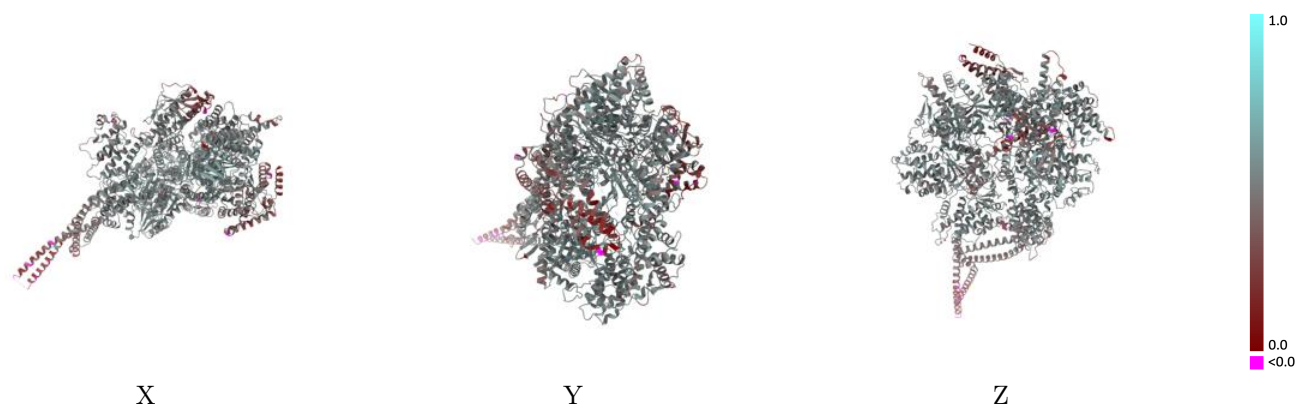
This section contains information regarding the fit between EMDB map EMD-44702 and PDB model 9BML. Per-residue inclusion information can be found in [section 3](#) on [page 5](#).

9.1 Map-model overlay [i](#)



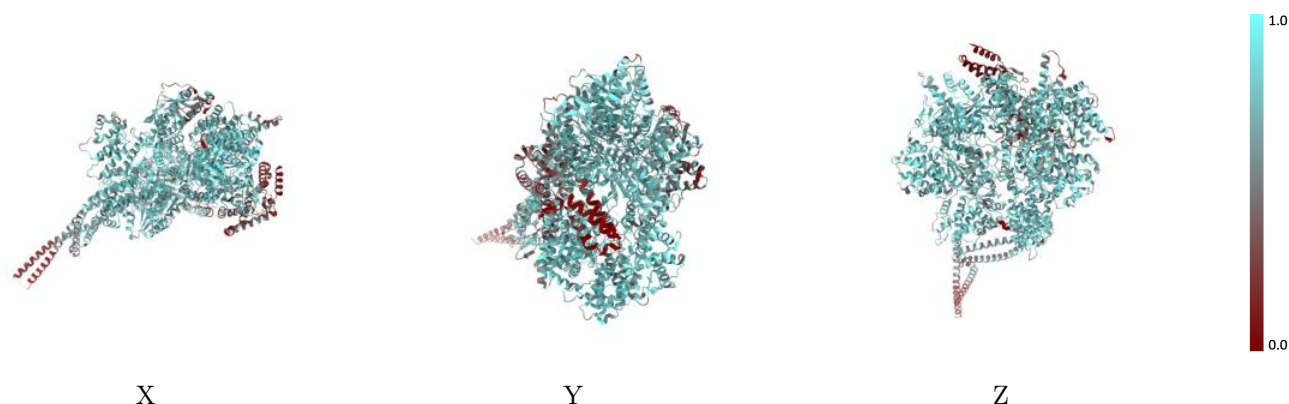
The images above show the 3D surface view of the map at the recommended contour level 0.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



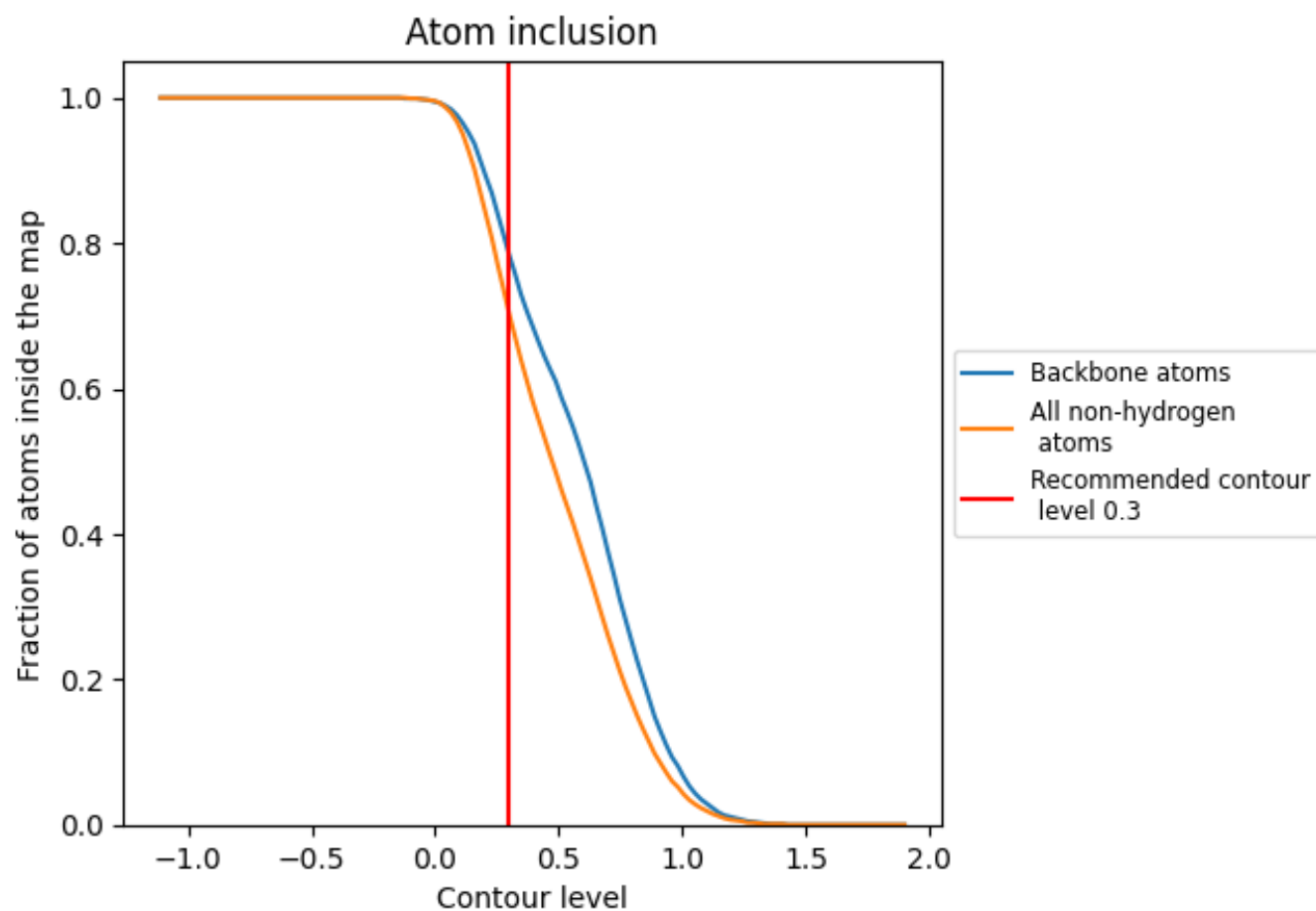
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.3).

9.4 Atom inclusion [i](#)



At the recommended contour level, 78% 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 (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.7020	<div></div> 0.4800
A	<div></div> 0.7020	<div></div> 0.4800

