



Full wwPDB EM Validation Report ⓘ

Aug 14, 2025 – 12:39 PM EDT

PDB ID : 9BN5 / pdb_00009bn5
EMDB ID : EMD-44722
Title : The alpha registry-locked dynein motor domain mutant in 5mM ATPVi condition, class1
Authors : Chai, P.; Zhang, K.
Deposited on : 2024-05-02
Resolution : 3.30 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

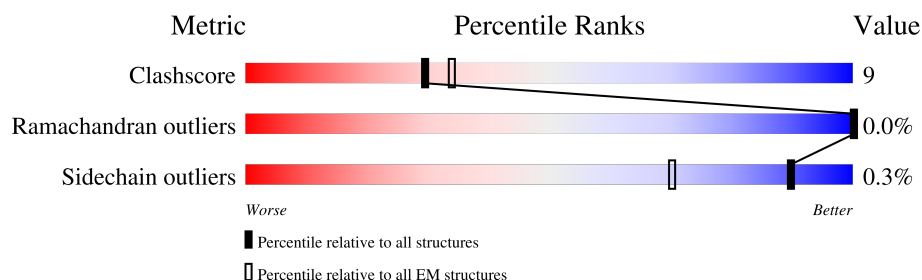
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	ATP	A	4702	-	-	X	-

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 23152 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.

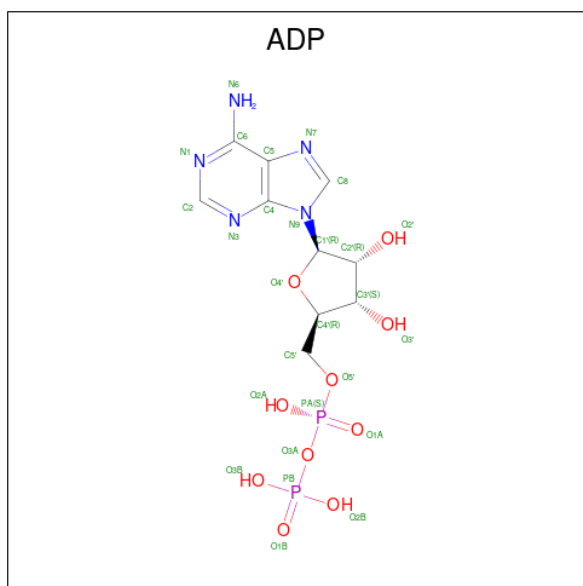
- Molecule 1 is a protein called Cytoplasmic dynein 1 heavy chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2866	Total	C	N	O	S	0	0
			23040	14688	3978	4259	115		

There is a discrepancy between the modelled and reference sequences:

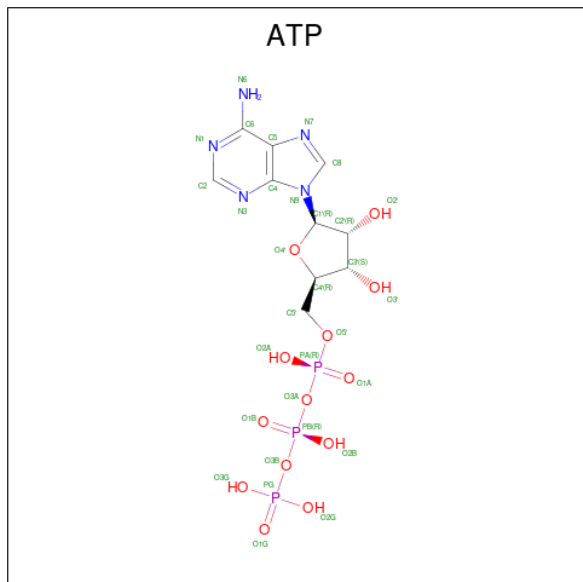
Chain	Residue	Modelled	Actual	Comment	Reference
A	2389	ASP	GLU	conflict	UNP Q14204

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

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



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





T4628	T4452	L4453	E4454	L4455	V4456	K4457	G4458	L4459	L4460	P4461	T4474	V4475	I4476	D4481	F4482	S4483	S4498	K4502	E4503	I4507	V4528	L4536	T4547	S4548	Q4549	G4550	A4551	T4552	L4553	D4554	S4557	L4577	I4581	W4592	V4593	K4594	M4597	T4598	E4599	K4601	A4602	S4603	R4615															
L4629	E4630	D4631	E4637	R4638	G4639	T4645	GLU	GLU	LYS	LYS	THR	ARG	THR	ASP	SER	THR	SER	ASP	GLY	ARG	PRO	A4375	N4376	M4377	R4378	T4379	L4380	H4381	M4386	L4390	I4391	P4392	Q4393	T4394	L4398	K4399	R4400	E4403	F4412	F4413	E4414	R4415	R4428	Q4429	D4433	V4437	C4438	E4439	G4440	K4441	K4442	K4443	Q4444	T4445	N4446	Y4447	L4448	R4449
R4276	S4277	E4281	L4284	A4285	C4286	K4287	G4290	H4291	K4292	D4293	I4294	D4298	G4299	I4300	R4301	R4302	E4303	E4310	D4314	P4318	L4321	G4322	L4323	P4324	N4325	N4326	A4327	E4328	R4329	V4330	K4342	M4343	L4344	K4345	M4346	D4347	MET	LEU	GLU	ASP	GLU	ASP	ASP	LEU	ALA	TYR	ALA	GLU	THR									
K4133	V4134	P4135	F4145	V4146	F4147	E4148	K4154	M4157	R4168	I4169	S4172	F4173	M4174	W4185	I4189	E4192	R4193	Y4196	L4199	G4200	W4201	E4206	F4207	D4211	D4220	A4227	R4230	I4233	K4237	L4246	M4247	S4250	I4251	Y4252	R4255	L4264	L4272	S4266	I4267	K4268	L4269	M4270	N4271	O4272	P4273	Q4274	R4275	S4276	T4277	U4278	V4279	W4280	X4281	Y4282	Z4283			
A4060	E4061	Q4062	N4063	T4064	Q4065	L4069	A4070	I4071	G4072	S4073	A4074	E4075	G4076	F4077	N4078	D4079	A4080	D4081	K4082	N4085	K4089	S4090	D4091	R4092	M4095	L4096	K4097	N4098	V4099	H4100	L4101	A4102	L4106	M4107	Q4108	L4109	E4110	K4111	L4112	L4113	H4114	S4115	L4116	Q4117	P4118	F4122	R4123	L4124	F4125	L4126	T4127	M4128						
H3960	L3961	D3962	S3963	S3964	S3965	E3967	Y3972	L3973	E3976	E3977	T3978	P3979	A3980	T3981	G3984	Q3985	R3989	L3990	R3997	P3998	D3999	R4000	M4004	N4012	E4015	L4025	I4030	T4033	E4034	P4037	P4040	M4043	V4046	P4047	G4048	Y4049	D4050	H4054	D4057	L4058	A4059																	
R3855	A3872	R3873	L3876	H3877	H3880	A3888	G3897	E3898	L3909	R3910	G3911	N3912	V3915	L3916	S3917	A3918	G3919	S3920	T3921	P3922	R3923	L3924	Q3925	G3926	L3927	T3928	Q3931	A3932	V3936	R3937	L3938	S3939	P3942	L3943	F3944	K3945	D3946	A3949	K3950	N3951	Q3952	A3953	D3954	E3955	Q3956	I3959												
L3753	N3754	E3755	V3756	K3757	G3758	R3759	I3760	L3761	D3762	D3763	D3764	I3765	I3766	I3767	T3768	T3769	L3770	E3771	N3772	L3773	K3774	R3775	E3776	A3777	A3778	R3782	E3785	E3786	T3787	T3788	V3790	K3791	Q3792	E3793	V3794	E3795	P3803	T3806	L3829	Y3836	H3837	N3838	V3839	E3842	N3843	L3846	K3847	G3848	H3852									
R3659	V3660	L3661	I3662	T3663	L3664	G3665	D3666	I3669	D3670	S3674	L3677	T3678	L3679	E3687	F3688	P3689	P3690	D3691	R3695	V3696	T3697	F3698	T3704	S3707	L3708	R3721	D3725	E3726	D3730	L3731	L3732	G3736	E3737	F3738	Q3739	L3740	R3741	L3742	R3743	Q3744	L3745	K3746	S3747	L3748	L3749	L3750	Q3751	A3752										
K3539	N3540	R3544	L3553	D3557	E3558	R3559	L3560	L3567	C3573	T3574	E3575	I3578	N3579	R3585	L3588	R3602	E3603	V3604	K3605	D3606	R3607	F3614	D3617	L3623	R3628	L3633	D3637	V3638	P3643	L3644	N3645	N3646	P3647	L3648	N3650	R3651	E3652	R3655	T3656	G3657	G3658																	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	112474	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	36000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.816	Depositor
Minimum map value	-1.230	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.042	Depositor
Recommended contour level	0.3	Depositor
Map size ($\text{\AA}$)	411.48, 411.48, 411.48	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.143, 1.143, 1.143	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: 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	0.25	0/23533	0.41	1/31898 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	2867	MET	CB-CA-C	-7.47	107.95	116.54

There are no chirality outliers.

There are no planarity outliers.

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	23040	0	23108	414	0
2	A	81	0	36	3	0
3	A	31	0	12	10	0
All	All	23152	0	23156	414	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 9.

All (414) 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:2742:ALA:O	1:A:2746:GLN:OE1	1.62	1.18
1:A:2603:MET:HE2	1:A:2603:MET:HA	1.27	1.14
1:A:1978:ILE:HD11	1:A:2001:LEU:HD11	1.54	0.89
1:A:4037:PRO:HG2	1:A:4117:GLN:HE21	1.41	0.86
1:A:3514:ILE:HG13	1:A:3579:MET:HG2	1.61	0.80
1:A:4201:TRP:HZ3	1:A:4207:PHE:HE2	1.29	0.80
1:A:2294:GLU:O	1:A:2338:ASN:ND2	2.16	0.79
1:A:2603:MET:HA	1:A:2603:MET:CE	2.13	0.78
1:A:3209:LYS:HG3	1:A:3486:ARG:HH21	1.48	0.78
1:A:3585:ARG:HB2	1:A:3697:THR:HG23	1.67	0.77
1:A:3137:PRO:HB3	1:A:3141:GLU:HB2	1.66	0.76
1:A:3942:PRO:HA	1:A:3945:LYS:HE3	1.69	0.75
1:A:2221:MET:HG3	1:A:2343:PHE:HB2	1.70	0.74
1:A:2275:TRP:HE1	1:A:2285:ARG:HH22	1.35	0.74
1:A:1582:VAL:HG23	1:A:1591:VAL:HG11	1.70	0.73
1:A:2192:THR:H	3:A:4702:ATP:HN61	1.36	0.73
1:A:4326:ASN:HD21	1:A:4581:ILE:HG23	1.54	0.73
1:A:2603:MET:HE2	1:A:2603:MET:CA	2.12	0.72
1:A:3158:ASN:ND2	1:A:3169:MET:O	2.23	0.72
1:A:4206:GLU:O	1:A:4255:ARG:NH1	2.24	0.70
1:A:2192:THR:H	3:A:4702:ATP:N6	1.88	0.69
1:A:2972:PHE:HZ	1:A:3008:MET:HE2	1.57	0.69
1:A:2567:VAL:O	1:A:2567:VAL:HG13	1.93	0.69
1:A:2569:VAL:CG2	1:A:2747:ILE:HG23	2.23	0.69
1:A:3154:LEU:HD21	1:A:3516:TYR:HB3	1.74	0.68
1:A:4247:MET:HG2	1:A:4251:ILE:HD11	1.76	0.68
1:A:2467:ARG:O	1:A:2471:GLN:NE2	2.26	0.68
1:A:3839:VAL:O	1:A:3843:ASN:ND2	2.27	0.67
1:A:4429:GLN:NE2	1:A:4433:ASP:OD2	2.28	0.67
1:A:2823:ARG:HE	1:A:2871:ILE:HG23	1.59	0.67
1:A:2993:ILE:HG22	1:A:3065:VAL:HB	1.76	0.67
1:A:1798:MET:SD	1:A:1800:GLN:NE2	2.68	0.66
1:A:3510:SER:HB3	1:A:3553:LEU:HD21	1.77	0.66
1:A:2622:PHE:HD1	1:A:2626:THR:HG21	1.61	0.65
1:A:1709:MET:HE1	1:A:1871:GLU:HA	1.78	0.65
1:A:2383:ARG:NH2	1:A:2424:GLN:OE1	2.31	0.64
1:A:2851:ASP:OD1	1:A:2865:LYS:NZ	2.30	0.64
1:A:2292:ARG:H	1:A:2292:ARG:HH11	1.46	0.64
1:A:2960:GLN:OE1	1:A:2998:ASN:ND2	2.30	0.64
1:A:4033:THR:OG1	1:A:4034:GLU:OE1	2.14	0.63
1:A:2623:SER:HA	1:A:2668:LEU:HD23	1.79	0.63
1:A:3846:LEU:HD12	1:A:3855:ARG:HE	1.64	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3981:THR:HG23	1:A:3984:GLY:H	1.62	0.63
1:A:2172:ARG:NH1	1:A:2173:GLY:O	2.31	0.63
1:A:2265:TYR:OH	1:A:2311:TRP:O	2.15	0.63
1:A:1864:ALA:HB2	1:A:1897:GLU:HB2	1.81	0.62
1:A:4043:MET:HB2	1:A:4127:THR:HA	1.81	0.62
1:A:2822:ILE:HD11	1:A:2854:ALA:HB1	1.81	0.61
1:A:4168:ARG:NH2	1:A:4220:ASP:OD2	2.33	0.61
1:A:3206:ARG:HH22	1:A:3207:LYS:HD3	1.65	0.61
1:A:3208:ILE:HB	1:A:3486:ARG:HH22	1.66	0.61
1:A:2829:ALA:O	1:A:2833:PHE:HB2	2.01	0.60
1:A:3169:MET:HG3	1:A:3698:PHE:HE2	1.65	0.60
1:A:4318:PRO:HG2	1:A:4325:ASN:HA	1.83	0.60
1:A:2377:ASN:CB	3:A:4702:ATP:C8	2.85	0.60
1:A:1509:LEU:O	1:A:3628:ARG:NH1	2.35	0.60
1:A:3909:LEU:HB3	1:A:4344:LEU:HD13	1.83	0.60
1:A:3961:LEU:O	1:A:3997:ARG:NH1	2.34	0.60
1:A:1911:GLY:HA3	2:A:4701:ADP:H8	1.65	0.59
1:A:3215:VAL:HG11	1:A:3478:LEU:HD11	1.84	0.59
1:A:3877:HIS:HA	1:A:3880:HIS:CD2	2.37	0.59
1:A:1795:SER:O	1:A:1800:GLN:NE2	2.35	0.59
1:A:4089:LYS:HD3	1:A:4118:PRO:HG2	1.85	0.58
1:A:3125:TYR:O	1:A:3126:MET:HE2	2.02	0.58
1:A:3972:TYR:HE1	1:A:3989:ARG:HH21	1.51	0.58
1:A:3502:THR:OG1	1:A:3544:ARG:N	2.35	0.58
1:A:1659:ALA:HB2	1:A:1926:PHE:HD1	1.66	0.58
1:A:2308:ASP:HB3	1:A:2311:TRP:NE1	2.19	0.58
1:A:2519:ARG:NH2	1:A:2527:PRO:O	2.37	0.58
1:A:2972:PHE:CZ	1:A:3008:MET:HE2	2.38	0.58
1:A:2567:VAL:O	1:A:2567:VAL:CG1	2.51	0.58
1:A:3122:VAL:HG11	1:A:3137:PRO:HD2	1.86	0.58
1:A:2622:PHE:CD1	1:A:2626:THR:HG21	2.37	0.57
1:A:1598:GLN:NE2	1:A:1602:GLU:OE2	2.34	0.57
1:A:2377:ASN:HB2	3:A:4702:ATP:N7	2.19	0.57
1:A:1721:VAL:HA	1:A:1724:VAL:HG12	1.86	0.57
1:A:3981:THR:O	1:A:3985:GLN:NE2	2.37	0.57
1:A:4100:HIS:HB3	1:A:4128:MET:HB2	1.86	0.57
1:A:4437:VAL:HG21	1:A:4444:GLN:HB3	1.86	0.57
1:A:2616:GLU:OE1	1:A:2654:GLN:NE2	2.38	0.57
1:A:4601:LYS:HE2	1:A:4603:SER:HB3	1.87	0.57
1:A:3113:MET:O	1:A:3140:ARG:NH2	2.37	0.57
1:A:2059:PHE:HE1	1:A:2101:GLY:HA2	1.71	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2654:GLN:O	1:A:2705:ARG:NH2	2.39	0.56
1:A:1808:LEU:O	1:A:1812:ILE:HD12	2.06	0.56
1:A:3650:ASN:HD21	1:A:3695:ARG:HH21	1.52	0.56
1:A:3499:GLN:O	1:A:3503:ILE:HG12	2.04	0.56
1:A:2826:ALA:HA	1:A:2850:ILE:HD11	1.88	0.56
1:A:2666:ILE:HG22	1:A:2712:CYS:SG	2.46	0.56
1:A:2811:ARG:HB2	1:A:2812:PRO:HD3	1.88	0.56
1:A:2527:PRO:HD3	1:A:2545:TRP:CD2	2.41	0.55
1:A:4040:PRO:HB3	1:A:4124:LEU:HD23	1.88	0.55
1:A:3888:ALA:HB1	1:A:4012:ASN:HD22	1.70	0.55
1:A:4392:PRO:O	1:A:4428:ARG:NH2	2.39	0.55
1:A:3520:PHE:HB3	1:A:3524:MET:HB2	1.88	0.55
1:A:2510:MET:HE3	1:A:2510:MET:HA	1.88	0.55
1:A:2868:SER:OG	1:A:2870:PRO:HD2	2.07	0.55
1:A:2191:LEU:HG	3:A:4702:ATP:C6	2.42	0.54
1:A:4193:ARG:NH1	1:A:4321:LEU:O	2.40	0.54
1:A:4399:LYS:NZ	1:A:4493:SER:OG	2.39	0.54
1:A:2210:LEU:HG	1:A:2220:LEU:HD11	1.89	0.54
1:A:2660:VAL:HG12	1:A:2707:GLN:HB3	1.88	0.54
1:A:4154:LYS:HE3	1:A:4310:GLU:HA	1.89	0.54
1:A:4460:LEU:HD12	1:A:4461:PRO:HD2	1.88	0.54
1:A:3923:ARG:NH1	1:A:3952:GLN:HB2	2.22	0.54
1:A:2309:PRO:O	1:A:2313:GLU:HG2	2.07	0.54
1:A:2905:LEU:HD11	1:A:2948:ARG:HE	1.72	0.54
1:A:2189:MET:HE1	1:A:2239:LYS:HG3	1.91	0.53
1:A:4264:LEU:HD11	1:A:4637:GLU:HA	1.91	0.53
1:A:2569:VAL:HG21	1:A:2747:ILE:HA	1.91	0.53
1:A:1511:PRO:HG2	1:A:3670:ASP:HB3	1.89	0.53
1:A:2877:LEU:HD13	1:A:2884:VAL:HG11	1.91	0.53
1:A:4211:ASP:OD2	1:A:4255:ARG:NH1	2.41	0.53
1:A:3193:GLU:O	1:A:3196:GLU:HG3	2.08	0.53
1:A:3488:ARG:HH12	1:A:3773:LEU:HD22	1.74	0.53
1:A:4090:SER:O	1:A:4092:ARG:NH1	2.42	0.52
1:A:4400:ARG:NH1	1:A:4414:GLU:OE2	2.42	0.52
1:A:2065:LEU:HD11	1:A:2133:GLU:HB3	1.91	0.52
1:A:3521:ASP:HB2	1:A:3704:THR:HG21	1.90	0.52
1:A:3731:LEU:HD11	1:A:3790:VAL:HG12	1.91	0.52
1:A:4196:TYR:OH	1:A:4328:GLU:OE1	2.22	0.52
1:A:2650:LEU:HD22	1:A:2703:LEU:HD22	1.91	0.52
1:A:3194:LEU:HA	1:A:3197:GLN:HG2	1.90	0.52
1:A:2704:GLU:HG3	1:A:2705:ARG:HG3	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3691:ASP:HB2	1:A:3695:ARG:HH12	1.74	0.52
1:A:2505:ASP:HB3	1:A:2733:VAL:HG23	1.92	0.52
1:A:2802:TRP:CZ2	1:A:2829:ALA:HB2	2.45	0.52
1:A:1752:LEU:HD11	1:A:1868:TYR:CZ	2.44	0.52
1:A:2862:ASP:OD1	1:A:2863:ARG:N	2.42	0.52
1:A:3033:CYS:HB2	1:A:3053:TRP:HZ3	1.75	0.52
1:A:3912:ASN:O	1:A:3937:ARG:NH1	2.43	0.52
1:A:4192:GLU:HB3	1:A:4321:LEU:HD21	1.92	0.52
1:A:2757:ARG:HG2	1:A:2763:ARG:HH12	1.75	0.51
1:A:4201:TRP:HZ3	1:A:4207:PHE:CE2	2.19	0.51
1:A:3487:GLU:O	1:A:3490:GLU:HG3	2.09	0.51
1:A:2071:PRO:O	1:A:2075:LEU:HG	2.10	0.51
1:A:2592:VAL:HG22	1:A:2710:GLY:HA3	1.92	0.51
1:A:2308:ASP:HB3	1:A:2311:TRP:HE1	1.76	0.51
1:A:2635:PHE:HB3	1:A:2650:LEU:HD11	1.92	0.50
1:A:3923:ARG:HH12	1:A:3952:GLN:HB2	1.75	0.50
1:A:2075:LEU:HD11	1:A:4536:LEU:HD13	1.91	0.50
1:A:2500:TRP:CZ2	1:A:2576:ARG:HD3	2.46	0.50
1:A:4381:HIS:HB2	1:A:4438:CYS:HB3	1.93	0.50
1:A:2741:PRO:O	1:A:2745:THR:HG23	2.12	0.50
1:A:2569:VAL:HG23	1:A:2747:ILE:HG12	1.94	0.50
1:A:2603:MET:CE	1:A:2603:MET:CA	2.82	0.50
1:A:2963:VAL:HG13	1:A:3643:PRO:HB2	1.92	0.50
1:A:1544:TRP:HE1	1:A:1572:SER:HA	1.76	0.50
1:A:3967:GLU:OE2	1:A:4000:ARG:NH2	2.42	0.50
1:A:1734:ASP:HB2	1:A:1737:THR:HG22	1.92	0.49
1:A:2293:GLY:HA2	1:A:2296:GLN:NE2	2.26	0.49
1:A:2309:PRO:HG3	1:A:2352:THR:HG23	1.94	0.49
1:A:2382:LEU:HD23	1:A:2420:ALA:HB2	1.94	0.49
1:A:3133:LEU:N	1:A:3134:PRO:HD3	2.27	0.49
1:A:4453:ASN:O	1:A:4457:LYS:NZ	2.44	0.49
1:A:2382:LEU:O	1:A:2416:GLN:NE2	2.43	0.49
1:A:3026:TYR:O	1:A:3030:MET:HG2	2.13	0.49
1:A:3645:LEU:HB3	1:A:3649:LEU:HD23	1.94	0.49
1:A:1463:LEU:HD21	1:A:1519:ASP:HB3	1.93	0.49
1:A:2221:MET:O	1:A:2361:MET:HB2	2.12	0.49
1:A:3739:GLN:O	1:A:3743:ARG:HG2	2.12	0.49
1:A:2060:ARG:HG2	1:A:2061:THR:HG23	1.94	0.49
1:A:3030:MET:HA	1:A:3033:CYS:SG	2.53	0.49
1:A:3876:LEU:HD23	1:A:4146:VAL:HG21	1.94	0.49
1:A:1934:GLU:HG3	1:A:1935:THR:H	1.78	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1933:ASP:OD1	1:A:1934:GLU:N	2.45	0.49
1:A:2217:ASN:O	1:A:2340:ARG:NH1	2.46	0.49
1:A:3836:TYR:HA	1:A:3839:VAL:HG12	1.93	0.49
1:A:4071:ILE:HG21	1:A:4099:VAL:HA	1.94	0.49
1:A:4099:VAL:HG12	1:A:4128:MET:HB3	1.95	0.49
1:A:4117:GLN:OE1	1:A:4117:GLN:N	2.46	0.49
1:A:2309:PRO:HA	1:A:2312:VAL:HG22	1.95	0.49
1:A:3021:PHE:CE1	1:A:3029:LEU:HB2	2.48	0.49
1:A:3633:LEU:HB3	1:A:3677:ILE:HD12	1.95	0.48
1:A:4474:THR:HG22	1:A:4476:ILE:H	1.78	0.48
1:A:3888:ALA:O	1:A:4012:ASN:ND2	2.47	0.48
1:A:2703:LEU:HD13	1:A:2706:ILE:HB	1.94	0.48
1:A:4157:MET:HE3	1:A:4185:TRP:HE3	1.77	0.48
1:A:3990:LEU:HA	1:A:4004:MET:HG2	1.95	0.48
1:A:1587:LEU:HB3	1:A:1590:ASP:HB2	1.95	0.48
1:A:2933:LEU:HB2	1:A:3065:VAL:HG13	1.96	0.48
1:A:4272:LEU:O	1:A:4277:SER:OG	2.27	0.48
1:A:1806:ARG:HE	1:A:1875:VAL:HG11	1.79	0.48
1:A:2500:TRP:HZ2	1:A:2576:ARG:HD3	1.79	0.48
1:A:2755:MET:HG3	1:A:2807:PHE:HD1	1.79	0.48
1:A:3034:LYS:O	1:A:3038:GLN:HG2	2.14	0.48
1:A:4030:ILE:HG21	1:A:4145:PHE:HZ	1.79	0.48
1:A:1698:ILE:HA	1:A:1701:TRP:NE1	2.27	0.48
1:A:2671:MET:HB2	1:A:2721:LYS:HG2	1.95	0.48
1:A:2686:MET:SD	1:A:2703:LEU:HD11	2.54	0.48
1:A:2939:SER:O	1:A:3172:THR:HB	2.14	0.48
1:A:3002:SER:O	1:A:3005:LEU:N	2.46	0.48
1:A:3607:ARG:NH2	1:A:3674:SER:O	2.47	0.48
1:A:4069:ILE:HD13	1:A:4080:ALA:HA	1.96	0.48
1:A:4577:LEU:HD22	1:A:4638:ARG:HD2	1.96	0.48
1:A:2961:ILE:HG12	1:A:2992:PHE:HE1	1.79	0.48
1:A:2205:GLU:HG3	1:A:2209:GLN:HE21	1.78	0.48
1:A:3204:GLY:HA2	1:A:3750:LEU:HD21	1.95	0.48
1:A:2441:PHE:HA	1:A:2449:LEU:HD23	1.95	0.47
1:A:4324:PRO:HD3	1:A:4638:ARG:HG3	1.96	0.47
1:A:1911:GLY:HA3	2:A:4701:ADP:C8	2.49	0.47
1:A:2209:GLN:O	1:A:2213:ILE:HG12	2.14	0.47
1:A:2839:GLU:HB2	1:A:2842:GLU:HG3	1.97	0.47
1:A:3623:LEU:HD11	1:A:3645:LEU:HD21	1.97	0.47
1:A:2448:ASP:OD1	1:A:2448:ASP:N	2.48	0.47
1:A:3659:ARG:HG3	1:A:3661:LEU:HG	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2937:GLY:HA3	1:A:3094:PHE:HB2	1.97	0.47
1:A:4246:LEU:O	1:A:4250:SER:OG	2.16	0.47
1:A:2220:LEU:O	1:A:2342:MET:HA	2.14	0.47
1:A:2269:ASP:OD1	1:A:2269:ASP:N	2.46	0.47
1:A:3966:PRO:HD2	1:A:4000:ARG:HG3	1.97	0.47
1:A:4286:CYS:O	1:A:4287:LYS:HG2	2.15	0.47
1:A:4169:ILE:HG21	1:A:4302:ARG:HE	1.80	0.47
1:A:2665:GLU:OE1	1:A:2720:ARG:NH1	2.48	0.47
1:A:2493:TYR:CD1	1:A:2539:VAL:HG11	2.50	0.46
1:A:1618:TYR:HD1	1:A:1621:ARG:HH21	1.63	0.46
1:A:3638:VAL:HG11	1:A:3679:LEU:HB3	1.98	0.46
1:A:4095:MET:HG2	1:A:4125:PHE:HB2	1.97	0.46
1:A:2535:ILE:HD12	1:A:2535:ILE:H	1.80	0.46
1:A:3069:ASN:ND2	1:A:3690:PRO:HG2	2.29	0.46
1:A:4196:TYR:HE2	1:A:4318:PRO:HB3	1.81	0.46
1:A:2377:ASN:CB	3:A:4702:ATP:H8	2.28	0.46
1:A:2457:SER:HB3	1:A:2732:PRO:HB3	1.97	0.46
1:A:3500:MET:HA	1:A:3500:MET:HE2	1.97	0.46
1:A:1698:ILE:HA	1:A:1701:TRP:CD1	2.51	0.46
1:A:1932:CYS:HB3	1:A:1963:LEU:HG	1.96	0.46
1:A:2181:GLU:HG3	1:A:2244:LEU:HD13	1.97	0.46
1:A:2439:HIS:O	1:A:2442:GLN:HG2	2.16	0.46
1:A:2613:PRO:O	1:A:2657:LYS:NZ	2.45	0.46
1:A:2849:ASN:HA	1:A:2852:THR:HG22	1.98	0.46
1:A:4227:ALA:HB2	1:A:4233:ILE:HD12	1.98	0.46
1:A:4342:LYS:O	1:A:4345:LYS:HG2	2.15	0.46
1:A:2760:PRO:HA	1:A:2763:ARG:HD3	1.97	0.46
1:A:4448:LEU:O	1:A:4452:ILE:HG12	2.16	0.46
1:A:1520:ALA:O	1:A:1524:GLU:N	2.47	0.45
1:A:2976:LEU:HA	1:A:2979:VAL:HG12	1.97	0.45
1:A:1892:MET:N	1:A:1892:MET:HE2	2.31	0.45
1:A:4554:ASP:H	1:A:4557:SER:HB2	1.81	0.45
1:A:2816:LEU:HD12	1:A:2817:PRO:HD2	1.98	0.45
1:A:3126:MET:SD	1:A:3538:GLN:NE2	2.89	0.45
1:A:1710:ARG:HG2	1:A:1870:PHE:O	2.17	0.45
1:A:2581:LEU:HD21	1:A:2593:LEU:HD21	1.98	0.45
1:A:2627:THR:OG1	1:A:2629:GLU:HG2	2.17	0.45
1:A:3205:LEU:HG	1:A:3489:TRP:HE3	1.81	0.45
1:A:4264:LEU:CD1	1:A:4637:GLU:HA	2.46	0.45
1:A:3196:GLU:HA	1:A:3199:MET:HG3	1.99	0.45
1:A:3939:SER:HA	1:A:3944:PHE:O	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2640:GLU:HG2	1:A:2653:VAL:HG22	1.98	0.45
1:A:4099:VAL:HG11	1:A:4126:LEU:HB3	1.99	0.45
1:A:2254:ILE:HG23	1:A:2279:LEU:HD23	1.97	0.45
1:A:1804:ARG:O	1:A:1808:LEU:HD23	2.17	0.45
1:A:2819:GLU:HB3	1:A:2864:GLU:HB3	1.98	0.45
1:A:3042:LEU:HD13	1:A:3053:TRP:HE1	1.80	0.45
1:A:3103:TYR:HD2	1:A:3132:LYS:HE2	1.81	0.45
1:A:4199:LEU:HG	1:A:4323:LEU:HD22	1.98	0.45
1:A:2488:ARG:O	1:A:2492:ARG:NH1	2.50	0.45
1:A:2742:ALA:O	1:A:2745:THR:OG1	2.17	0.45
1:A:1613:LYS:NZ	1:A:1617:GLU:OE2	2.50	0.44
1:A:2356:VAL:HG23	1:A:2361:MET:HE1	1.99	0.44
1:A:2569:VAL:HG21	1:A:2747:ILE:HG23	2.00	0.44
1:A:1533:LEU:HD11	1:A:1597:VAL:HG12	2.00	0.44
1:A:1912:LYS:HG2	1:A:2041:MET:HB2	1.99	0.44
1:A:2910:VAL:HG11	1:A:3105:VAL:HA	1.98	0.44
1:A:3602:ASN:HA	1:A:3605:LYS:HG3	1.98	0.44
1:A:3194:LEU:HD22	1:A:3500:MET:HE3	1.99	0.44
1:A:3689:PRO:HB2	1:A:3691:ASP:OD1	2.17	0.44
1:A:3604:TYR:HD1	1:A:3607:ARG:HD3	1.82	0.44
1:A:3872:ALA:HB1	1:A:3880:HIS:ND1	2.32	0.44
1:A:4106:LEU:HD23	1:A:4135:PRO:HD2	1.98	0.44
1:A:2211:TYR:HB2	1:A:2237:LEU:HD11	1.99	0.44
1:A:4481:ASP:OD1	1:A:4482:PHE:N	2.51	0.44
1:A:3721:ARG:HG2	1:A:3852:HIS:CE1	2.53	0.44
1:A:3764:ASP:HA	1:A:3767:ILE:HB	1.99	0.44
1:A:3980:ALA:C	1:A:3985:GLN:HE22	2.26	0.44
1:A:2864:GLU:HA	1:A:2867:MET:SD	2.58	0.43
1:A:2867:MET:SD	1:A:2867:MET:N	2.91	0.43
1:A:4631:ASP:OD1	1:A:4631:ASP:N	2.51	0.43
1:A:1604:LEU:O	1:A:1608:LEU:HD23	2.18	0.43
1:A:2245:GLU:HB2	1:A:2247:VAL:HG12	2.00	0.43
1:A:4615:ARG:NH1	1:A:4639:GLY:O	2.41	0.43
1:A:2943:LYS:HG2	1:A:3094:PHE:CD2	2.53	0.43
1:A:3169:MET:HG3	1:A:3698:PHE:CE2	2.50	0.43
1:A:3606:ASP:N	1:A:3606:ASP:OD1	2.51	0.43
1:A:4503:GLU:O	1:A:4507:ILE:HG13	2.17	0.43
1:A:2781:GLN:OE1	1:A:2794:TYR:HB2	2.19	0.43
1:A:3614:PHE:HE2	1:A:3638:VAL:HG12	1.83	0.43
1:A:4326:ASN:O	1:A:4330:VAL:HG23	2.19	0.43
1:A:4196:TYR:O	1:A:4200:GLY:N	2.47	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2377:ASN:HB2	3:A:4702:ATP:C8	2.54	0.43
1:A:2813:LEU:HD21	1:A:2816:LEU:HD13	2.01	0.43
1:A:3103:TYR:CD2	1:A:3132:LYS:HE2	2.54	0.43
1:A:3203:VAL:HG13	1:A:3206:ARG:HH21	1.83	0.43
1:A:3740:LEU:O	1:A:3744:GLN:HG2	2.19	0.43
1:A:4528:VAL:HG11	1:A:4592:TRP:HB2	2.00	0.43
1:A:1492:ASP:OD1	1:A:1492:ASP:N	2.50	0.43
1:A:2066:ALA:HA	1:A:2069:ILE:HG22	2.00	0.43
1:A:2752:ASN:OD1	1:A:2770:THR:OG1	2.25	0.43
1:A:1836:PHE:HA	1:A:1839:LEU:HB2	2.01	0.43
1:A:1941:MET:HA	1:A:1944:ILE:HB	2.00	0.43
1:A:3708:LEU:HD11	1:A:3829:LEU:HD11	2.01	0.43
1:A:3803:PRO:HA	1:A:3806:THR:HG22	2.00	0.43
1:A:1882:THR:HB	1:A:1883:PRO:HD2	2.00	0.42
1:A:2977:ARG:HG2	1:A:3021:PHE:CE2	2.54	0.42
1:A:3575:GLU:HA	1:A:3578:ILE:HD12	2.01	0.42
1:A:4247:MET:O	1:A:4252:TYR:HB2	2.19	0.42
1:A:2307:VAL:HB	1:A:2345:VAL:HG11	2.01	0.42
1:A:3042:LEU:HD13	1:A:3053:TRP:NE1	2.34	0.42
1:A:3210:GLU:OE2	1:A:3214:GLN:NE2	2.53	0.42
1:A:3647:PRO:HB3	1:A:3652:GLU:OE2	2.19	0.42
1:A:1914:GLU:HG3	2:A:4701:ADP:H2'	2.01	0.42
1:A:1501:ILE:HA	1:A:1504:VAL:HG22	2.01	0.42
1:A:2606:PHE:HE2	1:A:2617:VAL:HG11	1.83	0.42
1:A:1539:ASP:HA	1:A:1542:ARG:HG2	2.01	0.42
1:A:4043:MET:HE1	1:A:4147:PHE:CE1	2.55	0.42
1:A:4196:TYR:CE2	1:A:4318:PRO:HB3	2.55	0.42
1:A:1769:MET:SD	1:A:1776:ALA:HA	2.59	0.42
1:A:2756:LEU:HD12	1:A:2766:ALA:HB2	2.01	0.42
1:A:2765:TYR:C	1:A:2768:PRO:HD2	2.45	0.42
1:A:1659:ALA:HB2	1:A:1926:PHE:CD1	2.51	0.42
1:A:2186:CYS:C	1:A:2188:GLU:H	2.28	0.42
1:A:4237:LYS:HE2	1:A:4237:LYS:HB3	1.84	0.42
1:A:2377:ASN:CG	3:A:4702:ATP:H8	2.28	0.42
1:A:2934:LEU:HB3	1:A:3091:LEU:HA	2.02	0.42
1:A:3113:MET:SD	1:A:3184:ALA:HA	2.60	0.42
1:A:3588:LEU:HA	1:A:3679:LEU:HB2	2.02	0.42
1:A:1676:ILE:HD13	1:A:1709:MET:HG3	2.00	0.42
1:A:2242:GLU:HA	1:A:2247:VAL:O	2.20	0.42
1:A:3072:SER:O	1:A:3076:LYS:HG3	2.20	0.42
1:A:4113:LEU:HD23	1:A:4113:LEU:HA	1.86	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4189:ILE:HD13	1:A:4321:LEU:HD23	2.01	0.42
1:A:1766:LEU:HD23	1:A:1766:LEU:HA	1.92	0.42
1:A:2188:GLU:OE2	1:A:2243:ARG:NH2	2.53	0.42
1:A:2799:MET:HE2	1:A:2799:MET:HB3	1.91	0.42
1:A:3910:ARG:HD2	1:A:4344:LEU:HD11	2.01	0.42
1:A:1469:VAL:HG11	1:A:1500:HIS:NE2	2.35	0.41
1:A:1543:ARG:HD3	1:A:1608:LEU:HB3	2.01	0.41
1:A:2485:GLN:HE21	1:A:2542:SER:HA	1.85	0.41
1:A:2590:PRO:HB2	1:A:2731:VAL:HG12	2.02	0.41
1:A:2922:ILE:HG23	1:A:2933:LEU:HD11	2.02	0.41
1:A:3034:LYS:HB2	1:A:3044:LEU:HD13	2.02	0.41
1:A:3100:GLU:HG3	1:A:3104:GLN:HE21	1.85	0.41
1:A:3101:ALA:O	1:A:3105:VAL:HG23	2.19	0.41
1:A:4030:ILE:HA	1:A:4034:GLU:OE2	2.20	0.41
1:A:4629:LYS:HE2	1:A:4629:LYS:HB2	1.90	0.41
1:A:2641:TYR:CE1	1:A:2650:LEU:HD12	2.55	0.41
1:A:2837:LEU:HB3	1:A:2842:GLU:HB2	2.02	0.41
1:A:3873:ARG:HD2	1:A:4025:LEU:HD13	2.02	0.41
1:A:3932:ALA:O	1:A:3936:VAL:HG23	2.20	0.41
1:A:4025:LEU:HD21	1:A:4147:PHE:CZ	2.55	0.41
1:A:2106:GLU:O	1:A:2109:GLN:HG3	2.20	0.41
1:A:2933:LEU:HD12	1:A:3065:VAL:HG22	2.02	0.41
1:A:3151:HIS:CE1	1:A:3176:TYR:HB2	2.55	0.41
1:A:1910:THR:HG23	1:A:2044:PRO:HD3	2.02	0.41
1:A:2792:TYR:OH	1:A:2838:VAL:HG22	2.20	0.41
1:A:4412:PHE:O	1:A:4415:ARG:HG2	2.20	0.41
1:A:1682:GLU:OE1	1:A:1872:TYR:OH	2.29	0.41
1:A:3036:GLY:HA2	1:A:3039:LYS:HG2	2.03	0.41
1:A:3689:PRO:HA	1:A:3690:PRO:HD3	1.97	0.41
1:A:3928:THR:HG23	1:A:3931:GLN:H	1.85	0.41
1:A:4054:HIS:HA	1:A:4057:ASP:OD2	2.21	0.41
1:A:4117:GLN:O	1:A:4117:GLN:HG2	2.20	0.41
1:A:1651:GLN:HA	1:A:1654:PHE:HD2	1.85	0.41
1:A:2377:ASN:CG	3:A:4702:ATP:C8	2.98	0.41
1:A:2472:TYR:CE2	1:A:2481:MET:HB2	2.56	0.41
1:A:3471:LYS:HB3	1:A:3474:ARG:HG2	2.01	0.41
1:A:4111:LYS:HA	1:A:4111:LYS:HD3	1.79	0.41
1:A:4439:GLU:HB3	1:A:4441:LYS:NZ	2.35	0.41
1:A:2208:LEU:O	1:A:2212:GLN:HG2	2.21	0.41
1:A:2593:LEU:HD23	1:A:2734:VAL:HB	2.02	0.41
1:A:2617:VAL:HG13	1:A:2660:VAL:HG23	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3704:THR:HG23	1:A:3707:SER:H	1.86	0.41
1:A:1912:LYS:HB2	1:A:1912:LYS:HE2	1.95	0.41
1:A:2592:VAL:O	1:A:2733:VAL:HA	2.20	0.41
1:A:3838:ASN:ND2	1:A:3842:GLU:OE1	2.53	0.41
1:A:3872:ALA:O	1:A:3880:HIS:HE1	2.04	0.41
1:A:1809:GLU:HG3	1:A:2056:SER:HB2	2.03	0.41
1:A:2235:ARG:O	1:A:2239:LYS:HG2	2.21	0.41
1:A:2319:LEU:HD11	1:A:2343:PHE:HZ	1.86	0.41
1:A:2481:MET:HG3	1:A:2485:GLN:HB3	2.03	0.41
1:A:2620:LEU:HD23	1:A:2620:LEU:HA	1.88	0.41
1:A:3015:GLY:HA3	1:A:3059:ILE:HD11	2.03	0.41
1:A:3208:ILE:O	1:A:3212:VAL:HG23	2.21	0.41
1:A:3791:MET:HA	1:A:3794:VAL:HB	2.03	0.41
1:A:3959:ILE:HD12	1:A:3959:ILE:H	1.85	0.41
1:A:4037:PRO:HB3	1:A:4122:PHE:O	2.21	0.41
1:A:4095:MET:HE1	1:A:4097:LYS:HG2	2.02	0.41
1:A:2102:ASN:OD1	1:A:2105:ARG:NH2	2.53	0.41
1:A:2262:ASP:O	1:A:2266:GLY:N	2.52	0.41
1:A:2794:TYR:HE1	1:A:2836:ARG:HH22	1.69	0.41
1:A:2985:CYS:SG	1:A:2986:LYS:HG3	2.60	0.41
1:A:3073:GLU:HA	1:A:3076:LYS:HD2	2.03	0.41
1:A:3163:LYS:HD2	1:A:3163:LYS:HA	1.78	0.41
1:A:3976:GLU:HB3	1:A:3979:PRO:HD2	2.03	0.41
1:A:4046:VAL:HG21	1:A:4148:GLU:HG2	2.03	0.41
1:A:2034:LYS:HG3	1:A:2035:LEU:HG	2.02	0.40
1:A:2191:LEU:HG	3:A:4702:ATP:N6	2.36	0.40
1:A:3121:ILE:O	1:A:3540:ASN:ND2	2.52	0.40
1:A:3999:ASP:OD1	1:A:3999:ASP:N	2.53	0.40
1:A:4247:MET:HA	1:A:4251:ILE:HG12	2.03	0.40
1:A:2175:MET:HE3	1:A:2175:MET:HB2	1.97	0.40
1:A:2308:ASP:HB3	1:A:2311:TRP:CD1	2.56	0.40
1:A:2413:LEU:HD23	1:A:2413:LEU:HA	1.90	0.40
1:A:2957:SER:HB2	1:A:2990:ILE:HD13	2.03	0.40
1:A:3741:ARG:HH22	1:A:3745:LEU:HD22	1.87	0.40
1:A:4157:MET:CE	1:A:4185:TRP:HE3	2.32	0.40
1:A:1526:LYS:O	1:A:1530:ILE:HG12	2.21	0.40
1:A:1702:LEU:HA	1:A:1702:LEU:HD23	1.89	0.40
1:A:2520:ARG:HG3	1:A:2521:ILE:HG23	2.04	0.40
1:A:2770:THR:O	1:A:2774:VAL:HG23	2.22	0.40
1:A:2138:ILE:HD13	1:A:2168:VAL:HG13	2.03	0.40
1:A:2843:ARG:HH12	1:A:3093:TRP:HD1	1.69	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3567:LEU:HD11	1:A:3573:CYS:HB3	2.03	0.40
1:A:4284:LEU:HB2	1:A:4294:ILE:HB	2.03	0.40
1:A:2104:LYS:NZ	1:A:2133:GLU:OE2	2.55	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2854/4646 (61%)	2759 (97%)	94 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4172	SER

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	2548/4125 (62%)	2541 (100%)	7 (0%)	91	94

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2191	LEU
1	A	2452	LEU
1	A	2603	MET
1	A	2909	LEU
1	A	2910	VAL
1	A	2912	PHE
1	A	4174	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1541	GLN
1	A	1612	GLN
1	A	1643	ASN
1	A	1755	GLN
1	A	1860	GLN
1	A	1950	GLN
1	A	1979	GLN
1	A	2079	GLN
1	A	2187	GLN
1	A	2209	GLN
1	A	2218	HIS
1	A	2471	GLN
1	A	2621	ASN
1	A	2689	HIS
1	A	2849	ASN
1	A	2857	HIS
1	A	3009	ASN
1	A	3104	GLN
1	A	3197	GLN
1	A	3214	GLN
1	A	3534	HIS
1	A	3595	GLN
1	A	3646	ASN
1	A	3700	ASN
1	A	3826	GLN
1	A	3838	ASN
1	A	3843	ASN
1	A	3880	HIS
1	A	3906	GLN
1	A	3985	GLN
1	A	3988	HIS
1	A	4012	ASN

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Mol	Chain	Res	Type
1	A	4156	ASN
1	A	4191	GLN
1	A	4326	ASN
1	A	4347	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](#)

4 ligands are modelled in this entry.

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	0.75	0	29,45,45	0.78	1 (3%)
2	ADP	A	4703	-	24,29,29	0.73	0	29,45,45	0.74	1 (3%)
2	ADP	A	4704	-	24,29,29	0.73	0	29,45,45	0.77	1 (3%)
3	ATP	A	4702	-	28,33,33	0.74	0	34,52,52	0.76	1 (2%)

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	-	-	0/12/32/32	0/3/3/3
2	ADP	A	4703	-	-	1/12/32/32	0/3/3/3
2	ADP	A	4704	-	-	0/12/32/32	0/3/3/3
3	ATP	A	4702	-	-	1/18/38/38	0/3/3/3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	4703	ADP	C5-C6-N6	2.31	123.83	120.31
3	A	4702	ATP	C5-C6-N6	2.30	123.81	120.31
2	A	4704	ADP	C5-C6-N6	2.22	123.69	120.31
2	A	4701	ADP	C5-C6-N6	2.16	123.61	120.31

There are no chirality outliers.

All (2) torsion outliers are listed below:

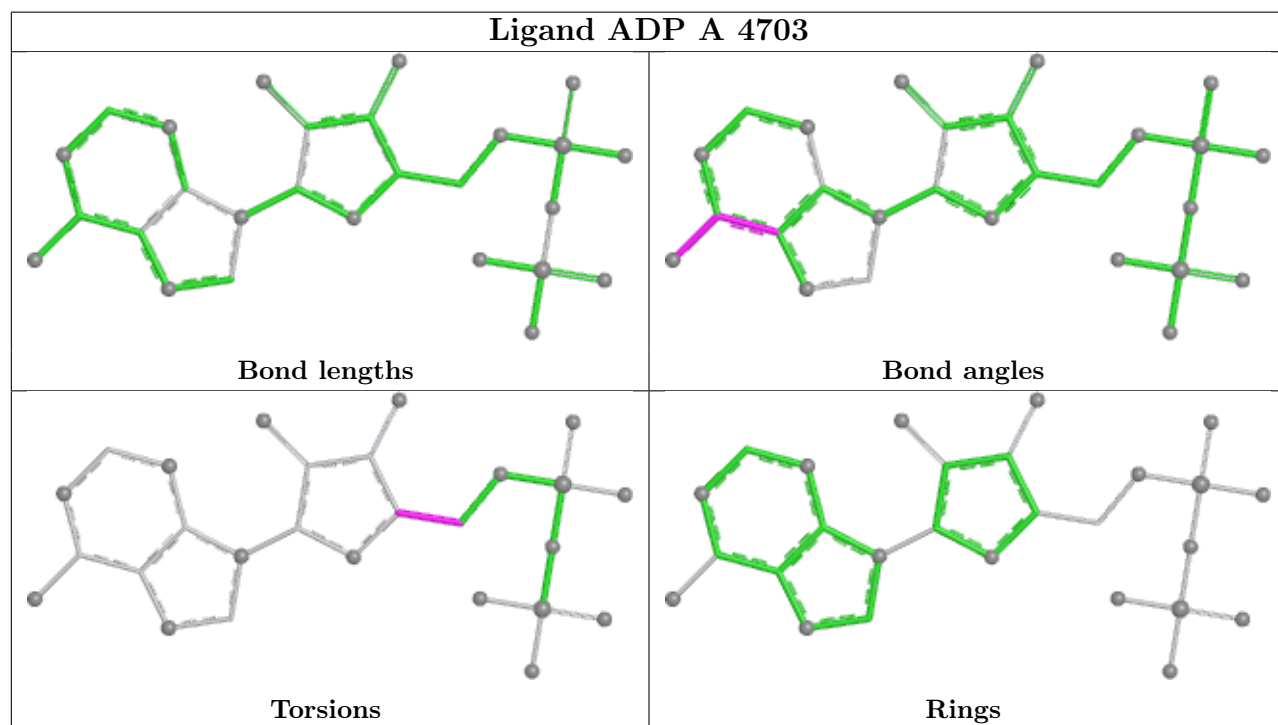
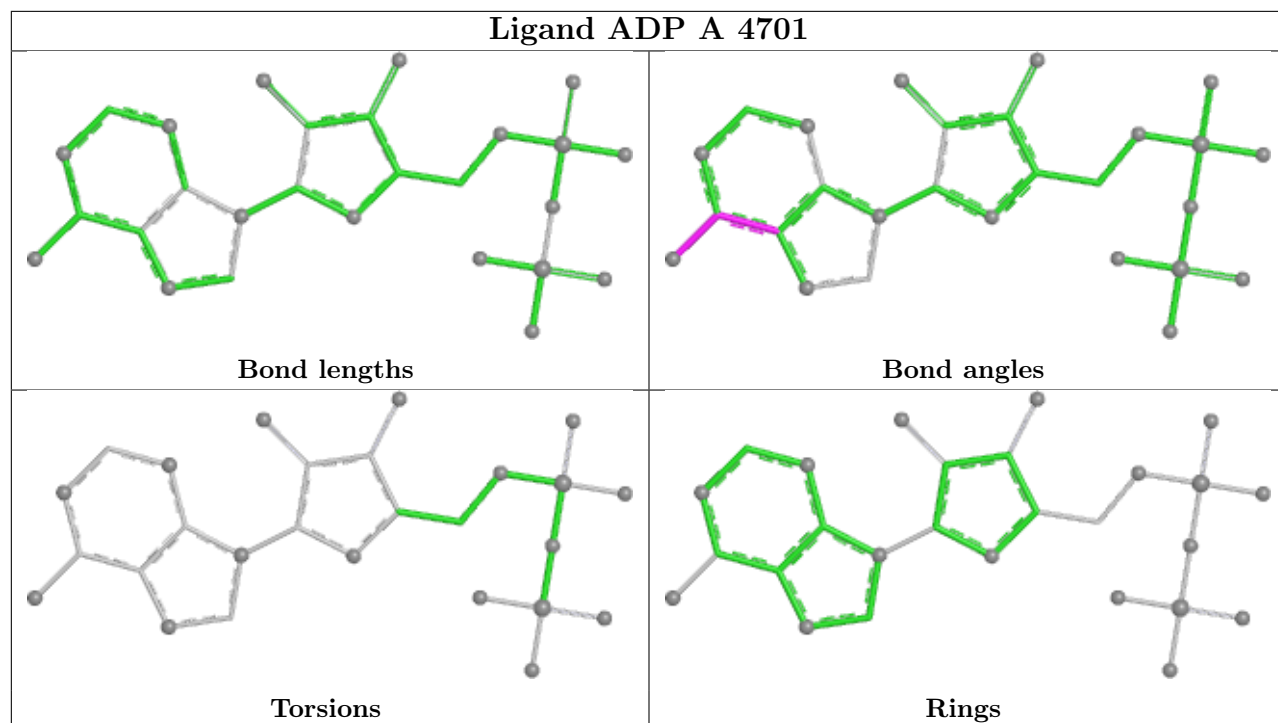
Mol	Chain	Res	Type	Atoms
3	A	4702	ATP	C5'-O5'-PA-O2A
2	A	4703	ADP	O4'-C4'-C5'-O5'

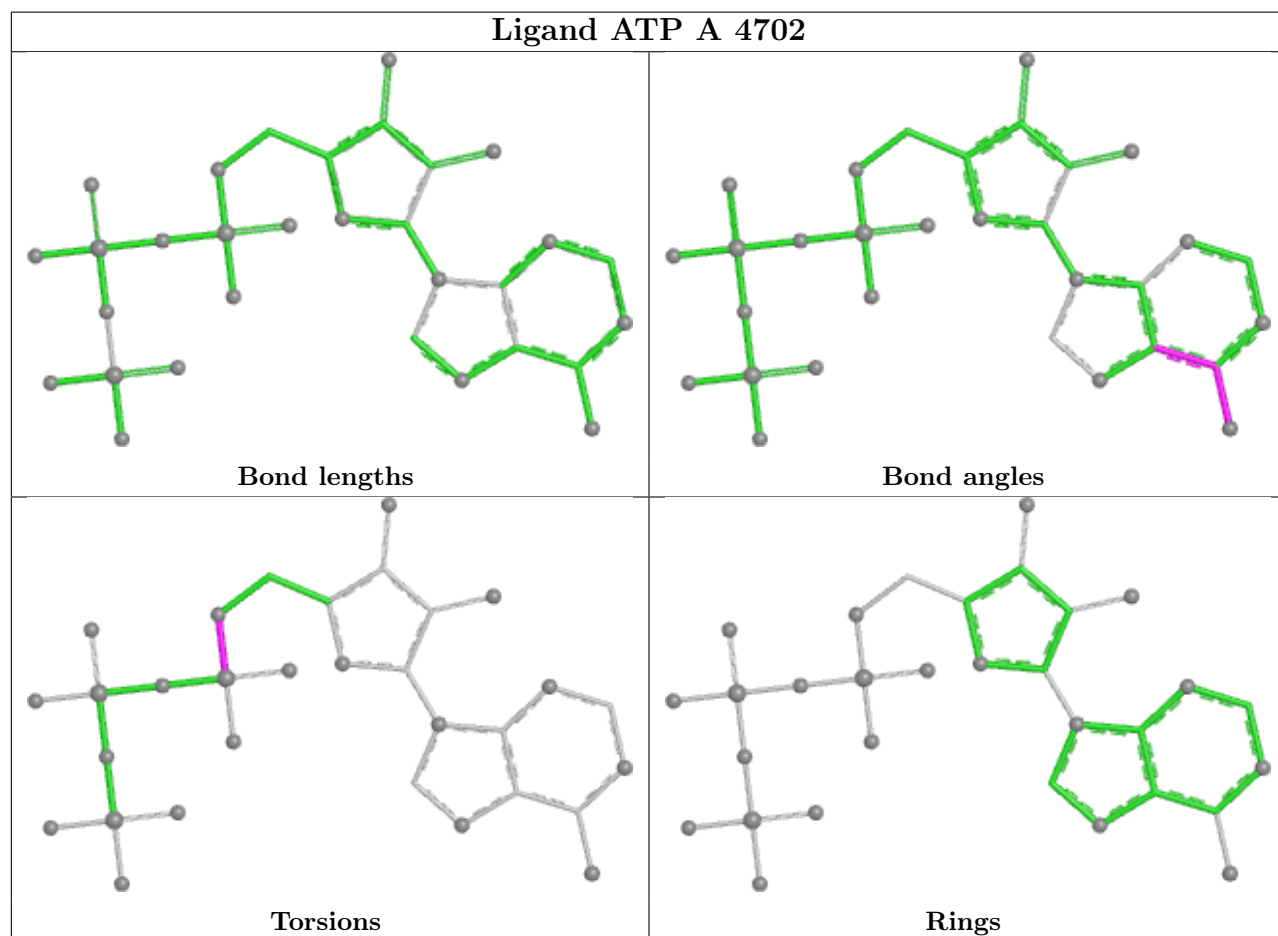
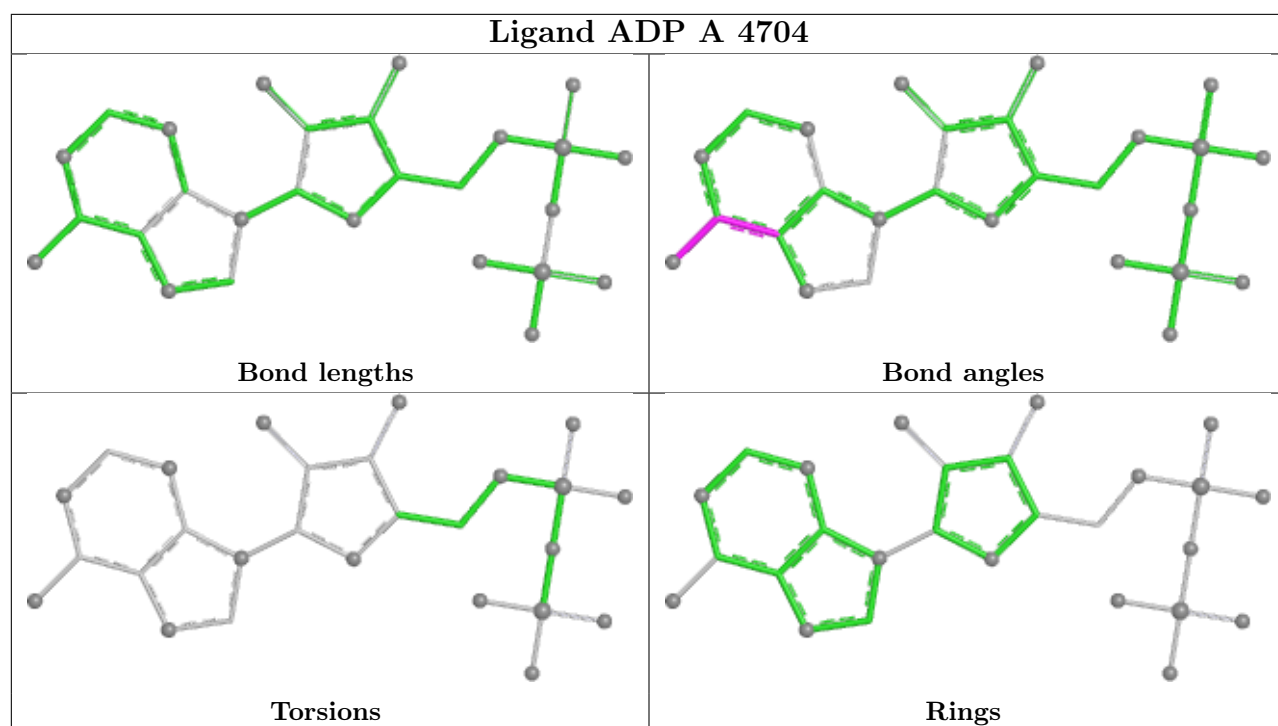
There are no ring outliers.

2 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4701	ADP	3	0
3	A	4702	ATP	10	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.

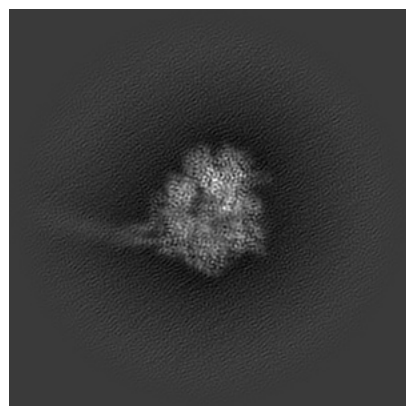
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44722. These allow visual inspection of the internal detail of the map and identification of artifacts.

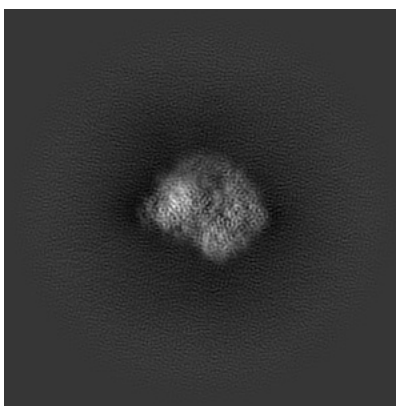
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

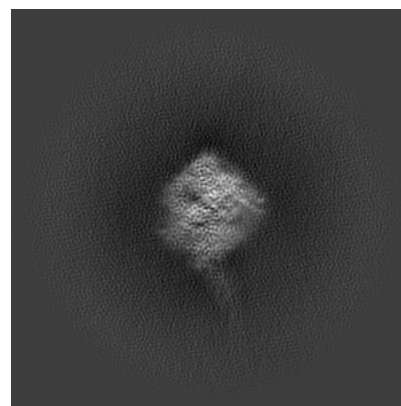
6.1.1 Primary map



X

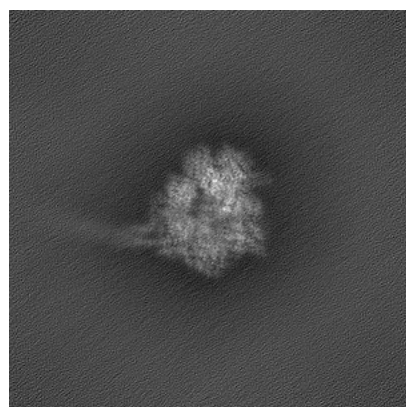


Y

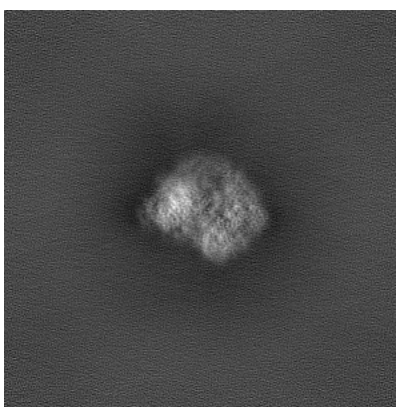


Z

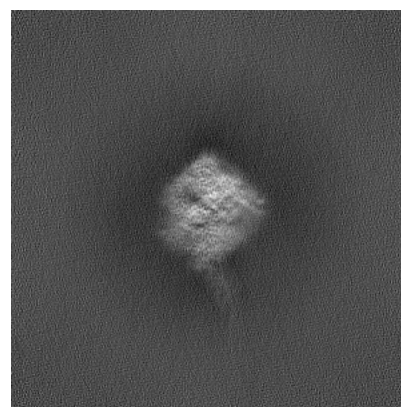
6.1.2 Raw map



X



Y

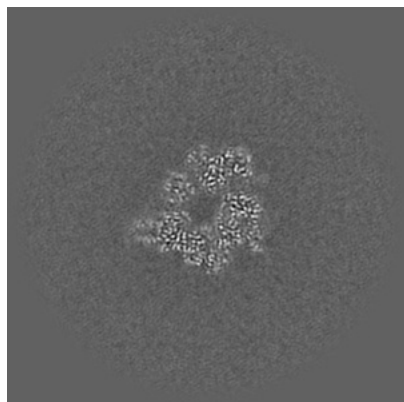


Z

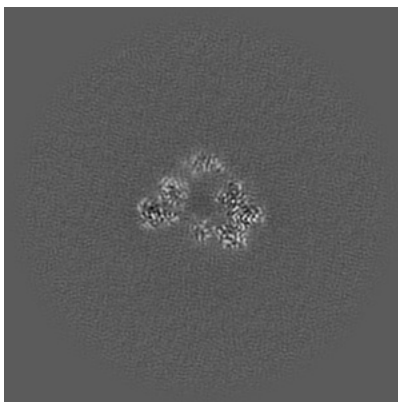
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

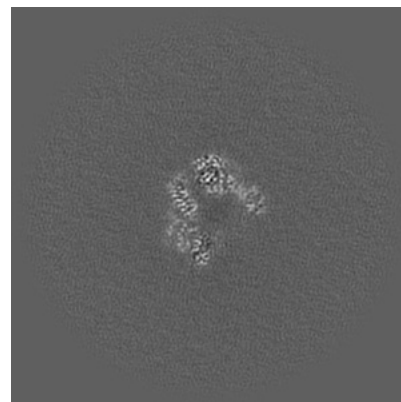
6.2.1 Primary map



X Index: 180

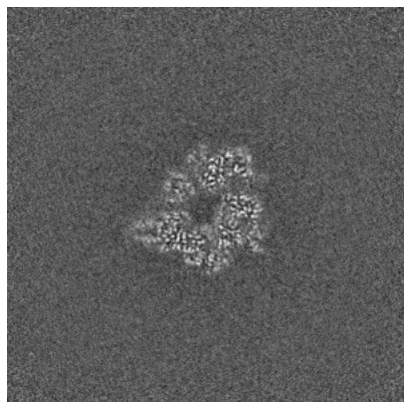


Y Index: 180

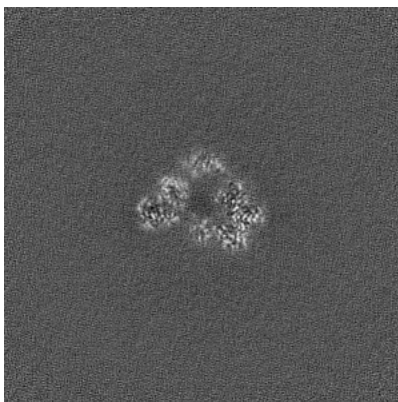


Z Index: 180

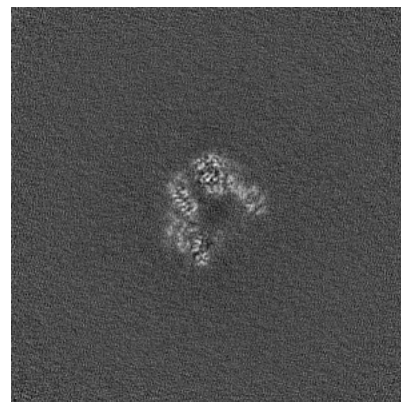
6.2.2 Raw map



X Index: 180



Y Index: 180

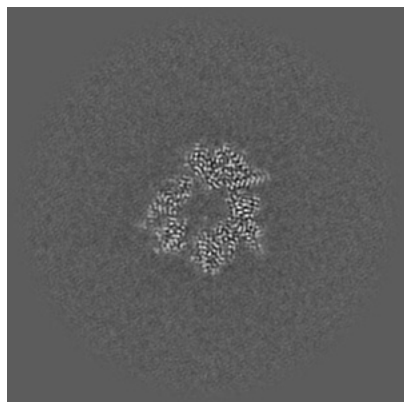


Z Index: 180

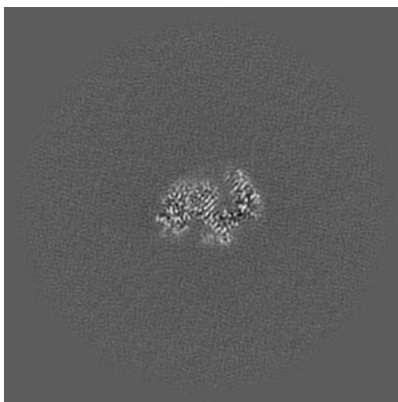
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

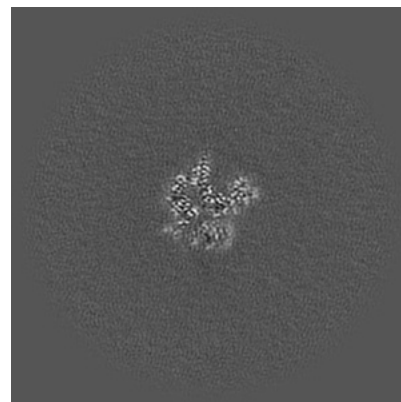
6.3.1 Primary map



X Index: 174

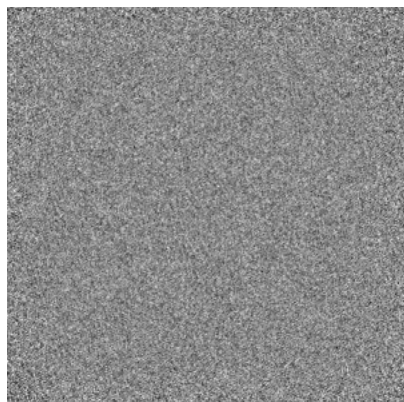


Y Index: 206

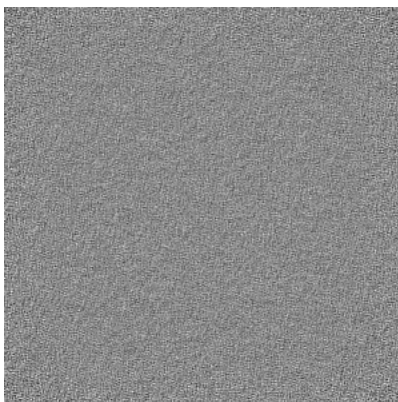


Z Index: 201

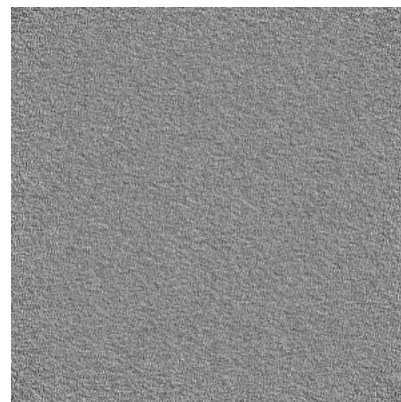
6.3.2 Raw map



X Index: 0



Y Index: 0

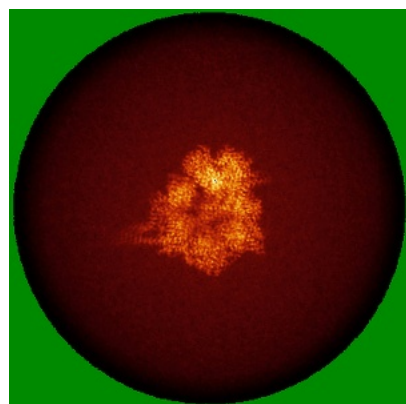


Z Index: 0

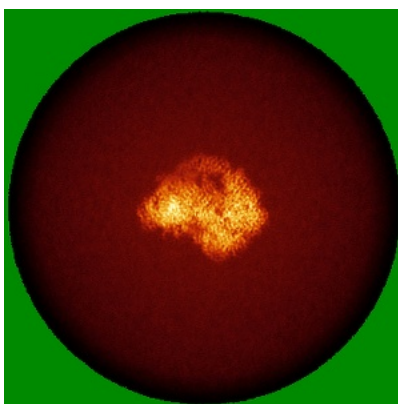
The images above show the largest variance slices of the map in three orthogonal directions.

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

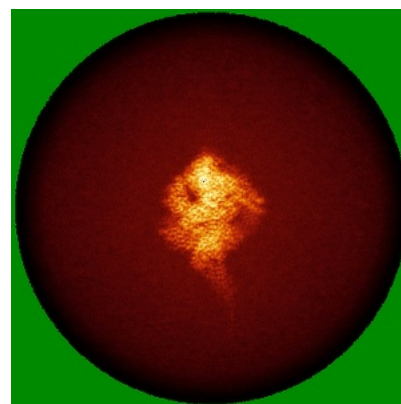
6.4.1 Primary map



X

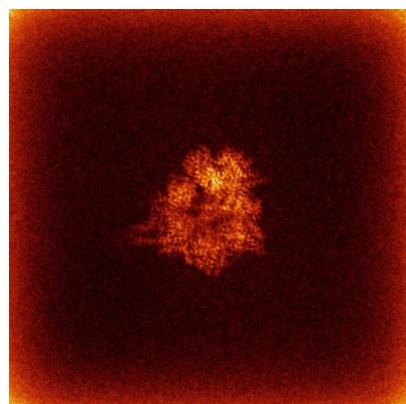


Y

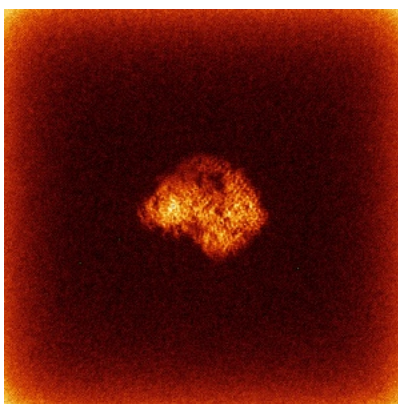


Z

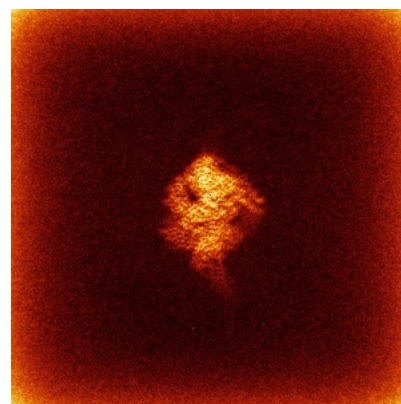
6.4.2 Raw map



X



Y

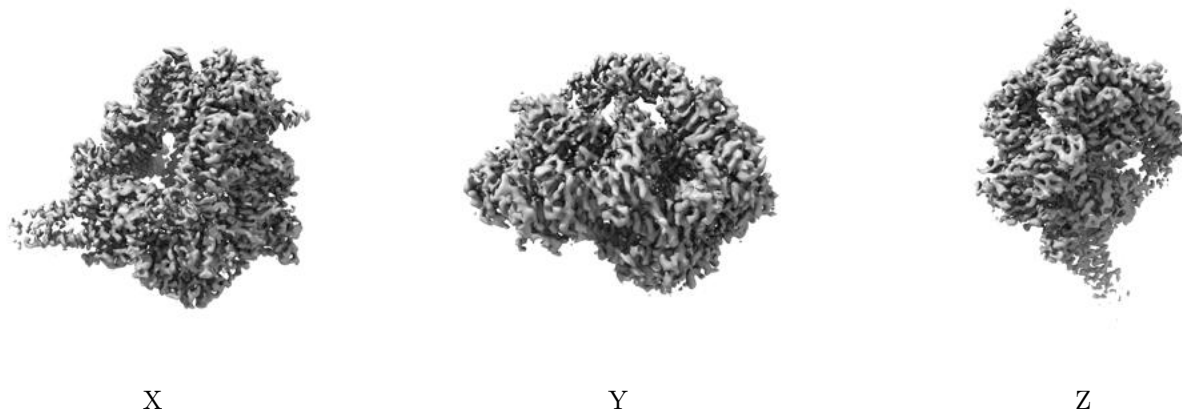


Z

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.

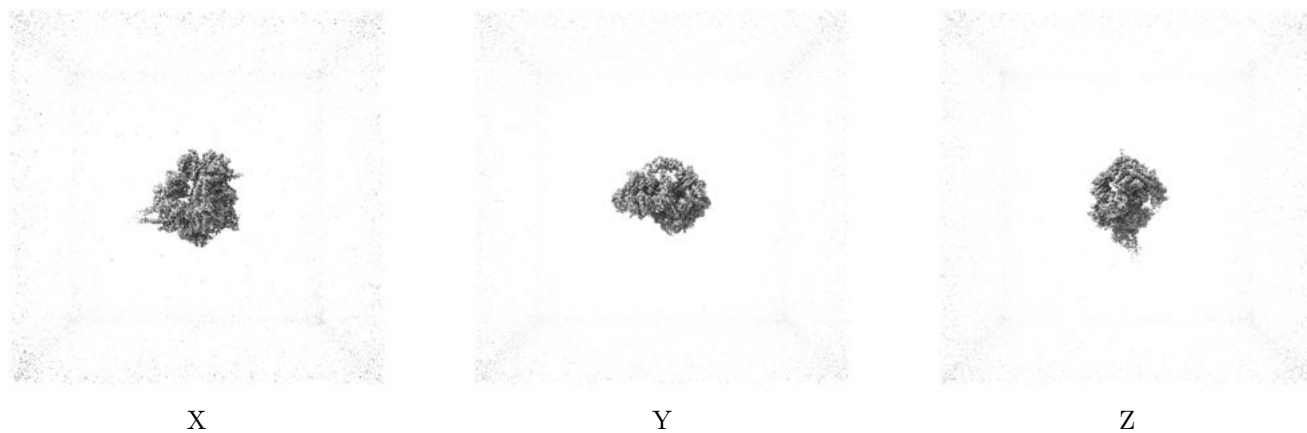
6.5 Orthogonal surface views [i](#)

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.

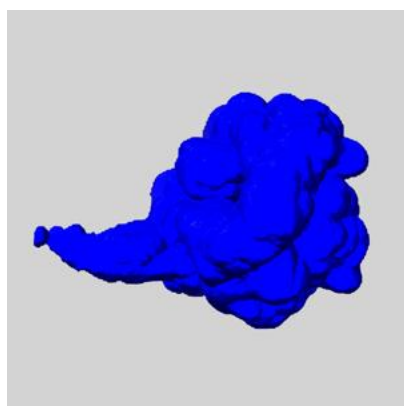
6.6 Mask visualisation [i](#)

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

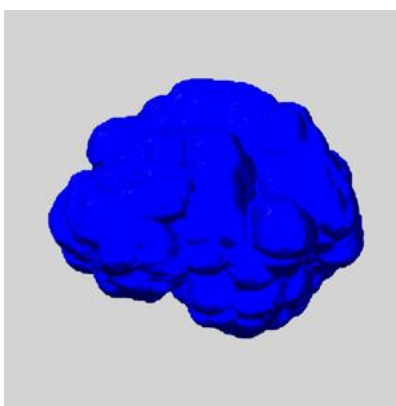
A mask typically either:

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

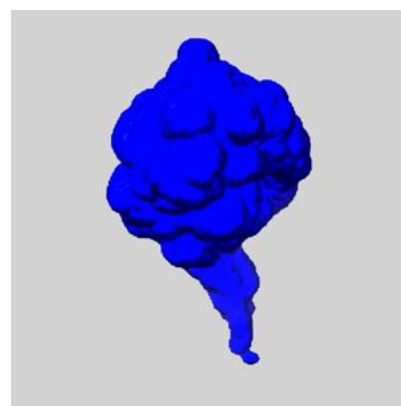
6.6.1 emd_44722_msk_1.map [i](#)



X



Y

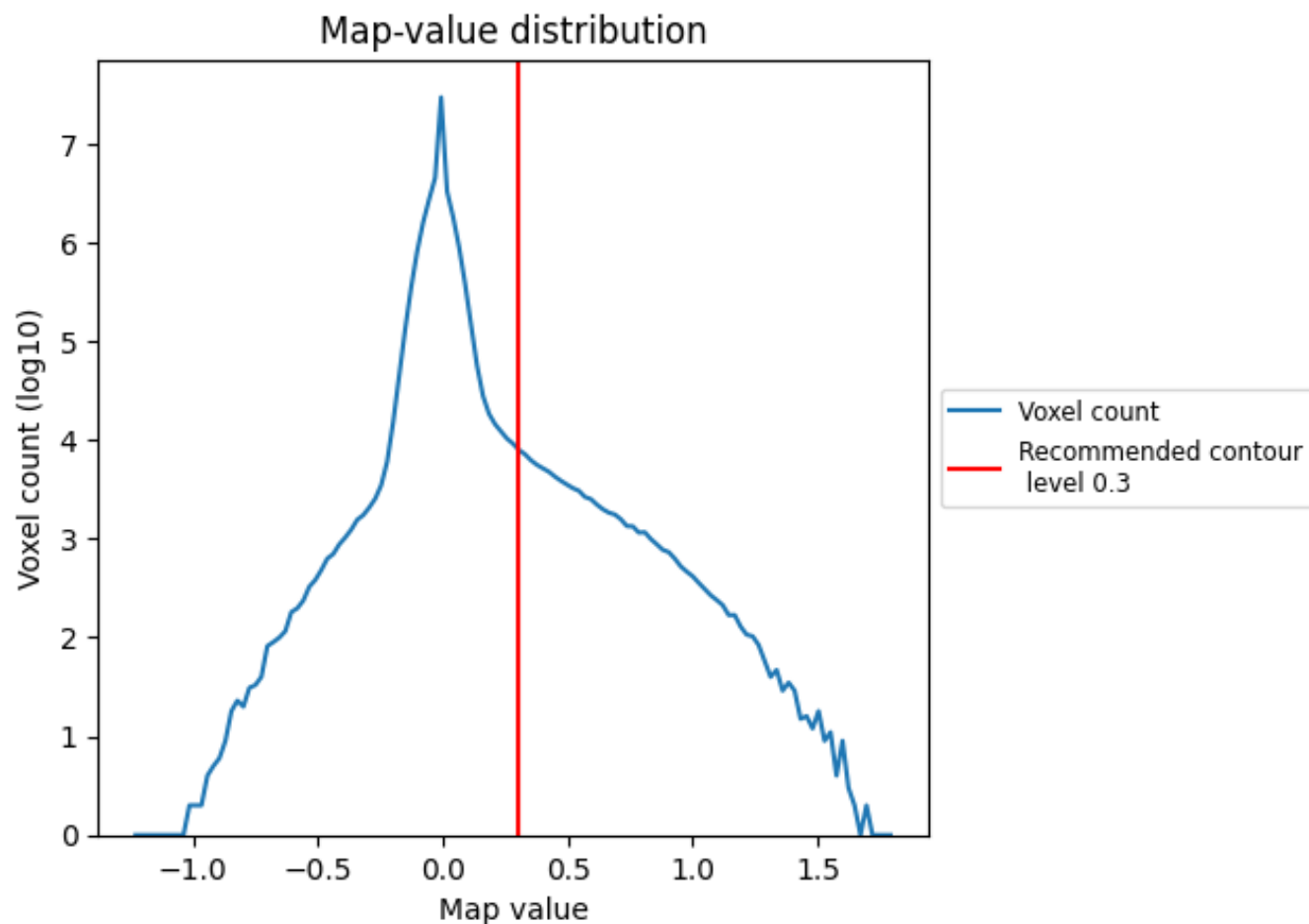


Z

7 Map analysis [i](#)

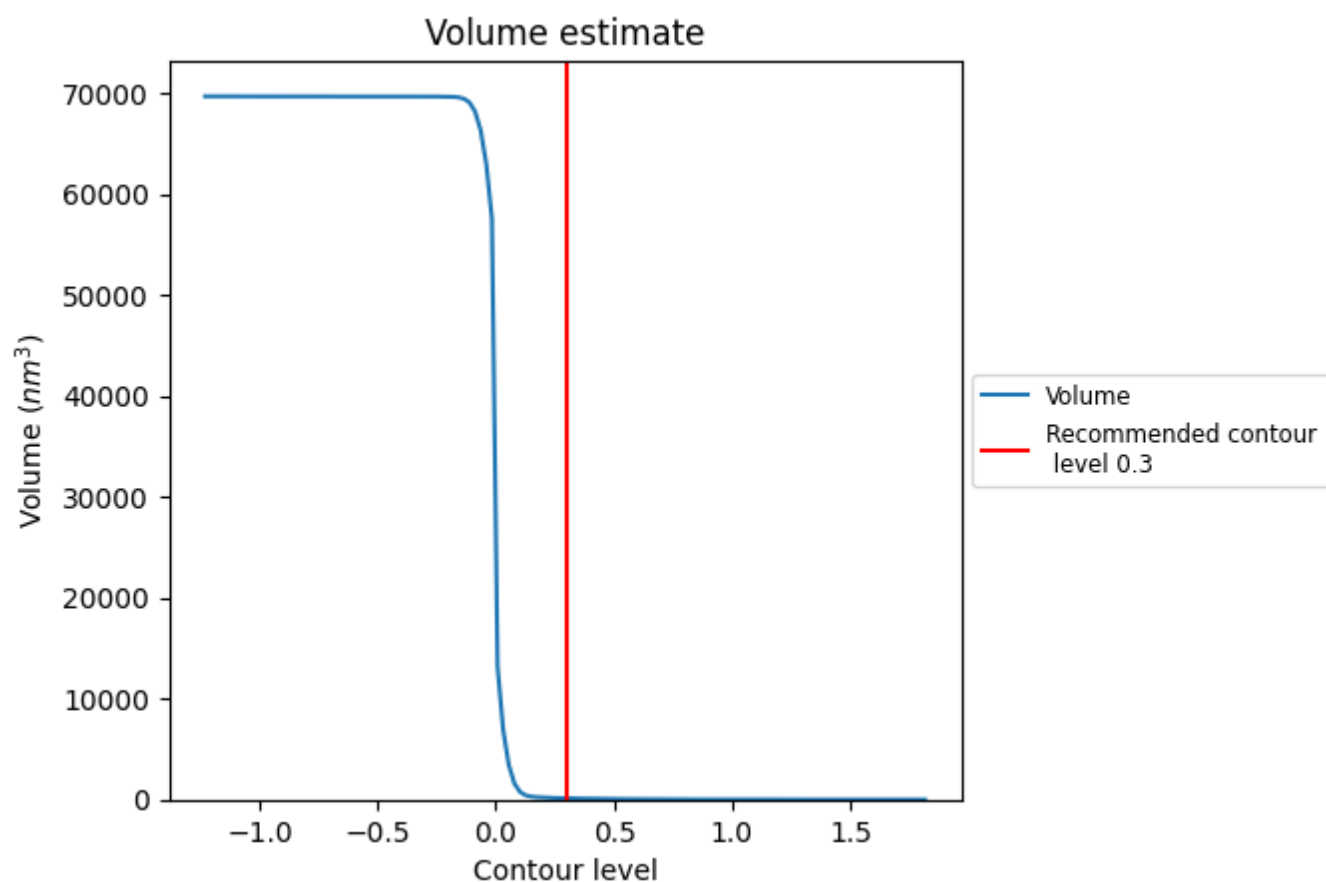
This section contains the results of statistical analysis of the map.

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.

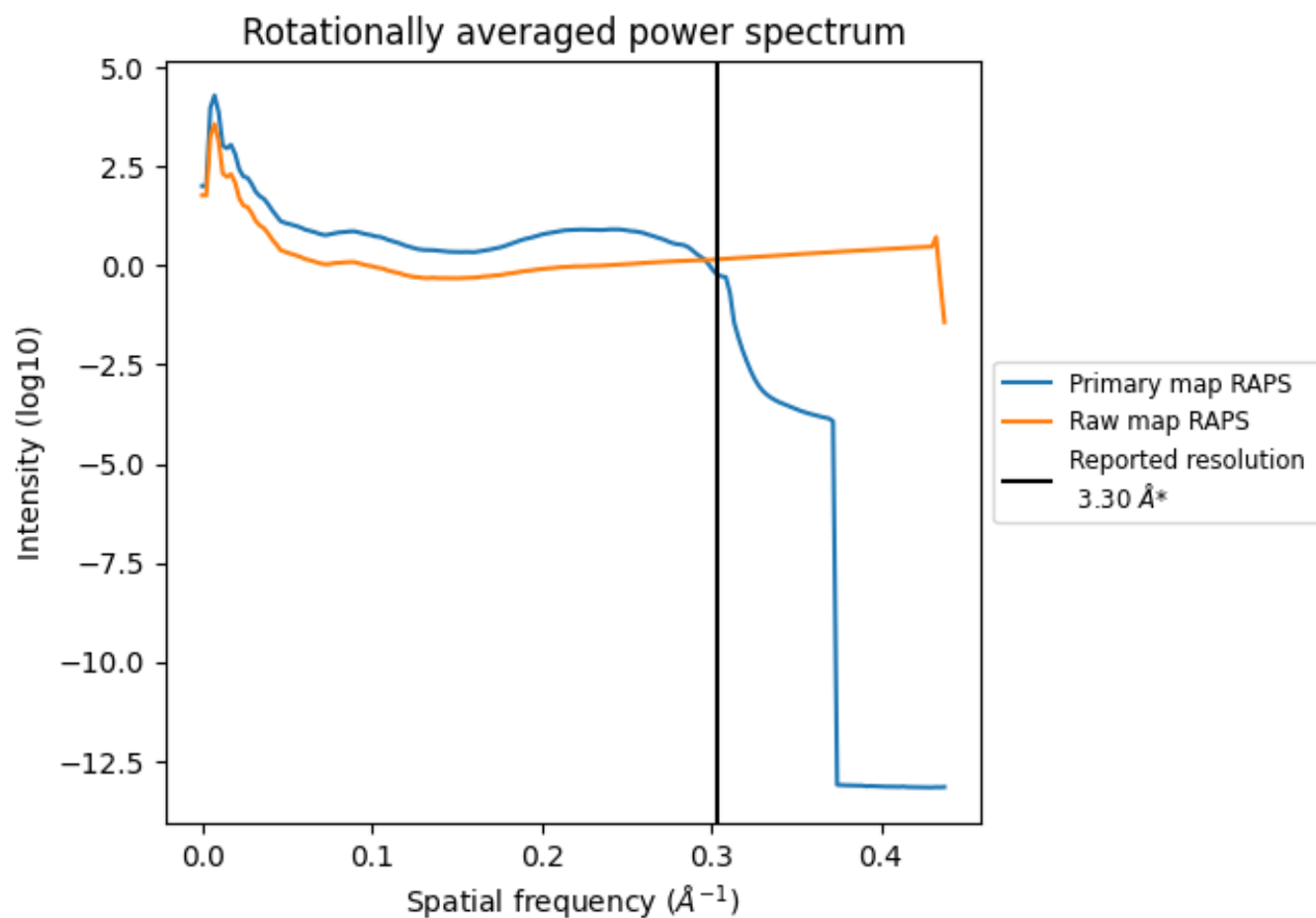
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 126 nm³; this corresponds to an approximate mass of 114 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 ⓘ

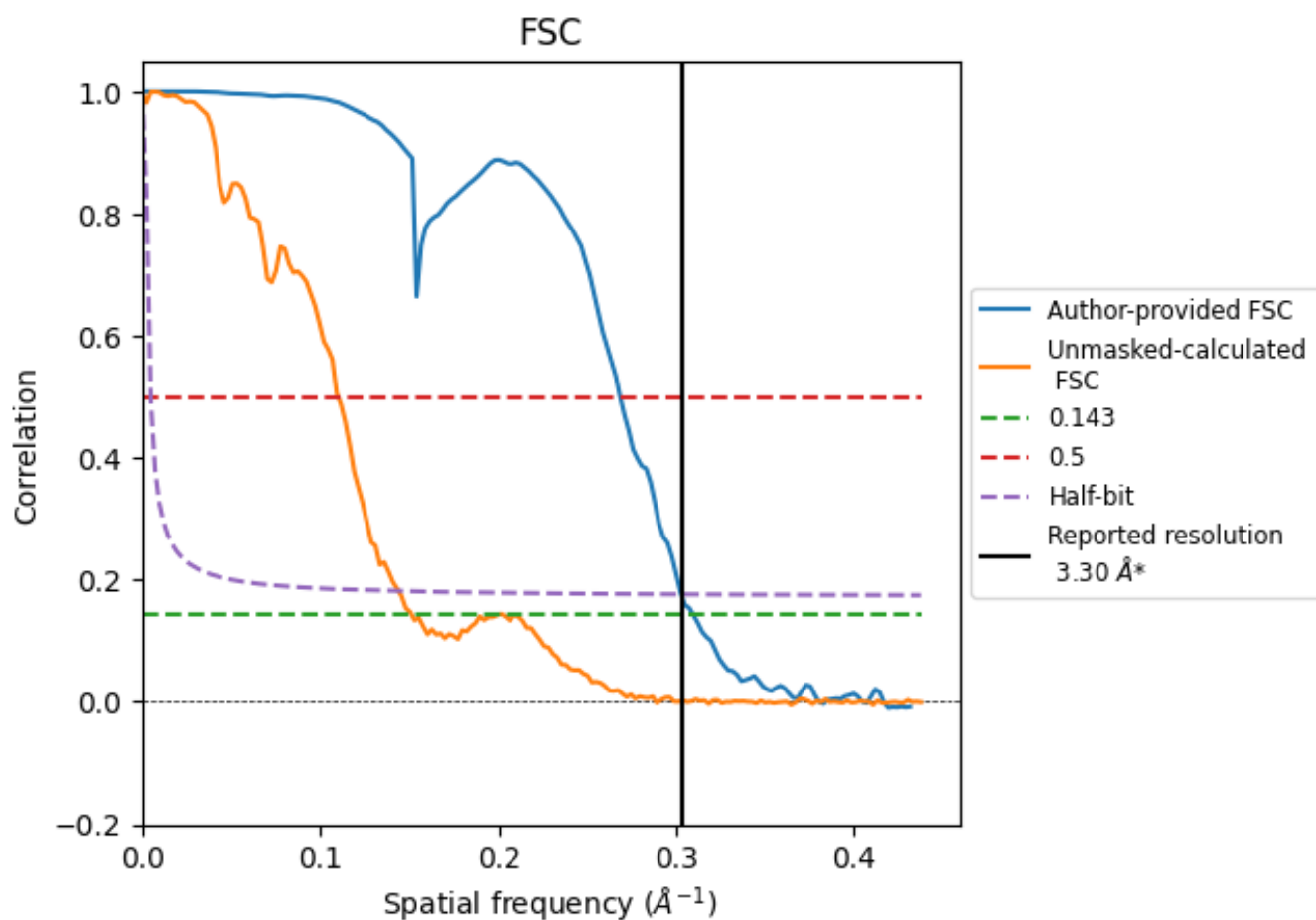


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

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

8.2 Resolution estimates [i](#)

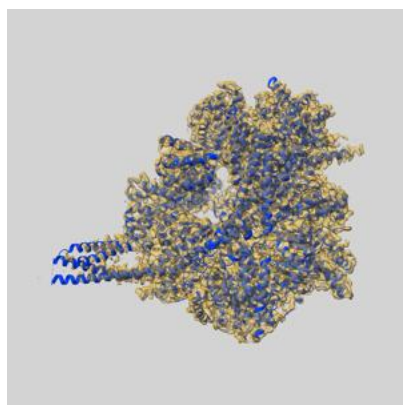
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	3.23	3.72	3.30
Unmasked-calculated*	6.61	9.08	6.93

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

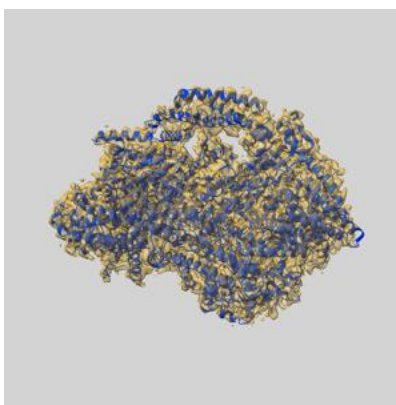
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-44722 and PDB model 9BN5. Per-residue inclusion information can be found in section [3](#) on page [5](#).

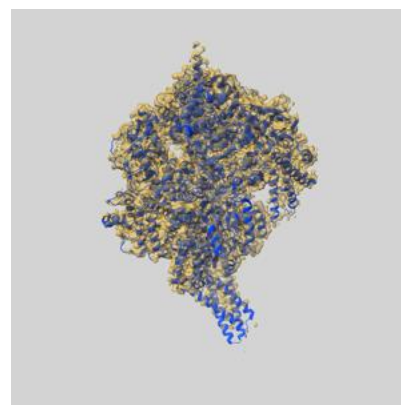
9.1 Map-model overlay [i](#)



X



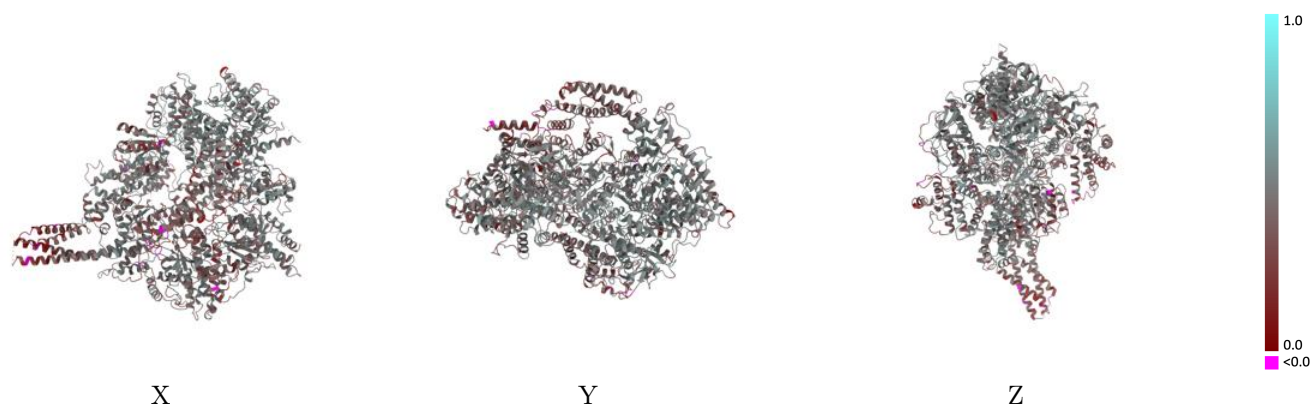
Y



Z

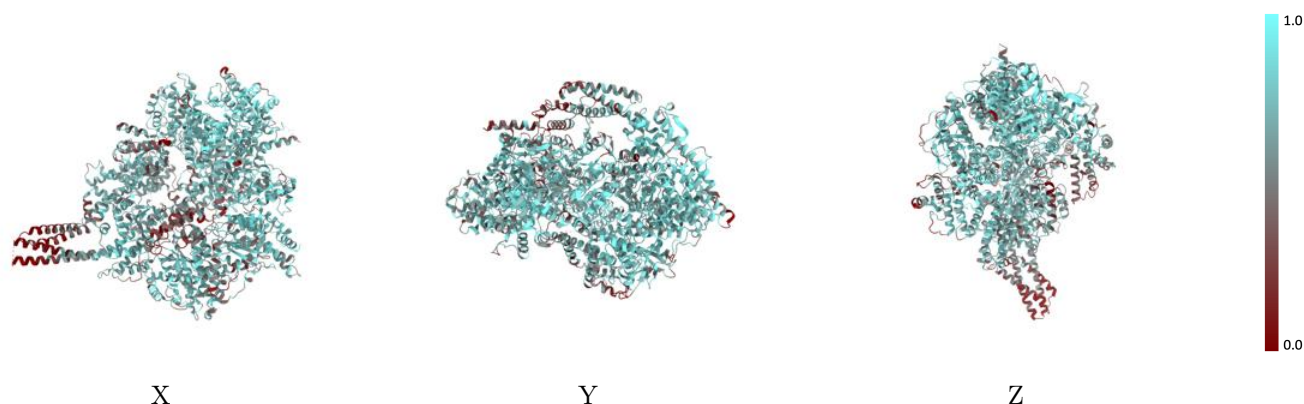
The images above show the 3D surface view of the map at the recommended contour level 0.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



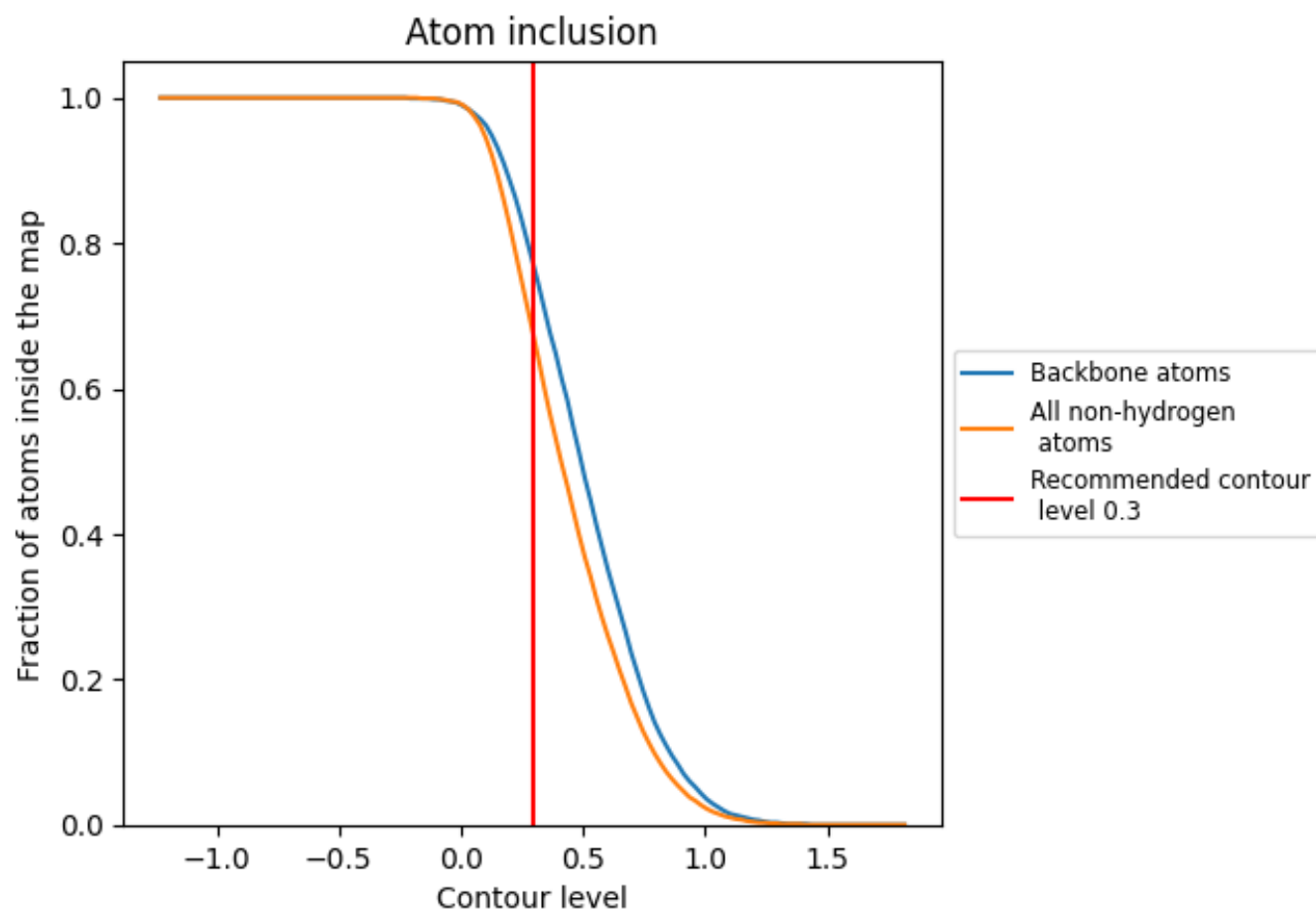
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 77% of all backbone atoms, 67% 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	0.6680	0.4310
A	0.6680	0.4310

