



Full wwPDB EM Validation Report ⓘ

Aug 14, 2025 – 01:41 PM EDT

PDB ID : 9BMY / pdb_00009bmy
EMDB ID : EMD-44715
Title : State-1 of motor domain from full-length human dynein-1 in apo condition
Authors : Chai, P.; Zhang, K.
Deposited on : 2024-05-02
Resolution : 2.86 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

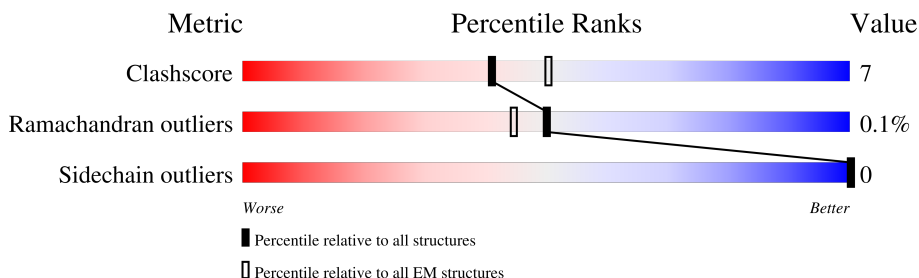
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.86 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	5% 52% 11% 37%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 23707 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
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0
2	A	1	27	10	5	10	2	0
2	A	1	27	10	5	10	2	0

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



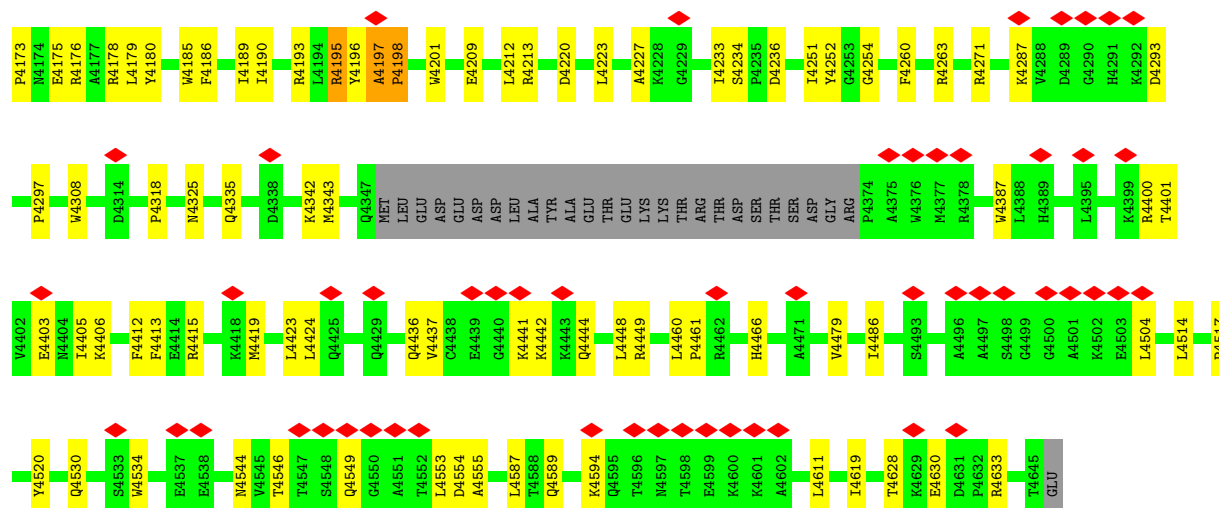
Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	5	13	3	

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

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



P3979	H3880	L3692	F3520	ILE	TYR	VAL	SER	R3167	M3030	D2851	R2694	E2513	GLU
A3980	K3891	C3693	M3524	ARG	ASN	LYS	GLN	+	Q3038	A2854	D2697	N2531	ASP
Q3985	T3895	S3694	D3546	LEU	TYR	ALA	ILE	T3172	M3043	H2857	Q2698	D2536	ALA
R3989	E3898	V3703	I3547	GLU	ILE	LEU	GLN	H3175	L3044	E2864	C2712	Y2537	GLN
R3997	E3898	V3716	I3547	SER	ASN	SER	GLN	H3182	D3045	E2864	C2712	E2538	ARG
L4001	D3902	L3731	L3553	ILE	ARG	ILE	LEU	H3183	E3049	M2867	R2720	W2548	ARG
L4002	F3908	L3740	D3557	ALA	ALA	LEU	GLN	Y3183	I3059	S2868	R2729	W2548	LYS
V4009	L3909	R3741	E3558	LEU	SER	LEU	GLN	A3184	E3049	R2869	W2730	W2548	LYS
L4013	R3910	L3742	W3562	GLY	ALA	GLY	GLU	L3194	I3059	T2882	V2731	V2557	GLU
M4021	N3912	Q3744	L3578	VAL	PRO	GLU	VAL	R3206	F3066	P2883	P2732	V2562	ASP
E4034	E3915	R3743	M3579	THR	THR	GLU	ILE	T3211	E3073	L2905	Y2738	A2563	GLY
P4037	L3916	Q3745	R3581	ASP	VAL	SER	ALA	V3212	K3076	D2906	P2751	A2564	GLU
M4043	S3917	L3750	R3582	TRP	TRP	ASP	LYS	D3213	D3077	F2912	M2755	P2565	ALA
A4051	N3918	N3754	F3583	ALA	ALA	LYS	GLN	E3216	N3092	E2914	L2756	V2567	ALA
I4071	A3918	K3757	R3584	ILE	ILE	ILE	VAL	E3217	D3096	M2917	R2757	D2573	ALA
A4087	G3919	G3758	R3585	ALA	GLN	ARG	LYS	L3218	W3097	D2917	R2763	R2576	ALA
V4088	G3920	R3759	L3588	LEU	ASN	ILE	ASP	E3219	T3110	R2921	M2773	L2581	ALA
R4092	S3922	I3760	T3597	TYR	TYR	ILE	LEU	R3220	T3110	T2925	E2774	Y2582	ALA
L4096	P3922	D3762	I3600	ALA	ALA	MET	ASP	D3221	S3111	T2925	M2773	Y2582	ALA
M4097	R3923	D3763	M3601	ASP	ASP	ARG	LYS	L3222	K3112	Q2930	E2775	P2590	ALA
V4099	R3923	D3764	K3608	LEU	LEU	ASN	GLU	R3223	M3113	L2933	F2776	L2591	ALA
H4100	I3924	T3765	K3608	LYS	LYS	PHE	PRO	T3224	D3114	L2933	F2784	V2592	ALA
G4104	Q3925	I3766	R3611	ARG	VAL	ILE	ALA	T3225	L3115	L2933	F2784	L2443	ALA
W4105	G3926	I3767	R3611	VAL	VAL	ALA	ALA	S3226	F3116	T2961	T2788	E2444	ALA
L4106	E3926	I3767	R3611	GLU	GLU	THR	ILE	S3227	K3117	T2961	Q2789	H2445	ALA
M4107	E3926	I3767	R3611	PRO	PRO	ILE	ILE	Q3227	F3118	T2961	P2790	H2445	ALA
L4116	E3926	I3767	R3611	ASN	ASN	VAL	ALA	E3228	N3119	T2961	H2791	L2449	ALA
Q4117	E3926	I3767	R3611	ASN	ASN	VAL	ALA	E3229	D3124	D2973	Y2792	T2450	ALA
P4118	E3926	I3767	R3611	GLU	GLU	ALA	ALA	V3231	Y3125	E2974	L2612	R2451	ALA
T4127	E3926	I3767	R3611	LYS	LYS	GLU	LYS	K3232	L3133	V2979	L2620	L2452	ALA
M4128	E3926	I3767	R3611	ILE	ILE	ILE	ILE	N3233	Q3135	M2994	N2621	C2454	ALA
R4143	E3926	I3767	R3611	SER	SER	SER	LYS	A3234	H3139	E2995	E2629	S2457	ALA
P4150	E3926	I3767	R3611	ASP	ASP	ALA	LYS	A3235	R3140	E2996	L2630	H2461	ALA
T4160	E3926	I3767	R3611	ALA	ALA	ILE	HIS	A3236	E3141	S2997	L2631	Q2471	ALA
R4168	E3926	I3767	R3611	LYS	LYS	ARG	LEU	N3237	A3142	N2998	K2633	F2479	ALA
S4172	E3926	I3767	R3611	ASP	ASN	GLY	VAL	D3238	I3143	D3001	W2825	Y2638	ALA
L3973	E3926	I3767	R3611	GLN	GLN	LYS	GLU	K3239	V3148	S3002	D2835	R2643	ALA
H3974	E3926	I3767	R3611	VAL	VAL	MET	VAL	L3240	Q3152	R3007	L2659	E2487	ALA
S3975	E3926	I3767	R3611	LYS	LYS	LYS	ARG	K3241	L3153	H3008	E2665	R2488	ALA
E3976	E3926	I3767	R3611	ASN	ASN	TYR	ALA	E3242	L3154	N3014	I2666	Q2491	ALA
E3977	E3926	I3767	R3611	GLU	GLU	MET	ALA	+	A3157	R2844	I2666	R2492	ALA
T3978	E3926	I3767	R3611	VAL	VAL	SER	PRO	+	+	W2845	N2667	I2498	ALA
				ALA	ALA	ASN	ALA			T2946	D2505	D2505	ALA
				GLN	GLN	PRO	ALA			L3020	E2688	H2689	ALA
				GLN	GLN	ALA	ALA						ALA
				ALA	ALA	GLU	GLU						ALA
				LYS	LYS	GLU	GLU						ALA
				LYS	LYS	LYS	LYS						ALA
				VAL	VAL	VAL	VAL						ALA
				MET	MET	SER	ALA						ALA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	136324	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)	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	2.445	Depositor
Minimum map value	-1.410	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.053	Depositor
Recommended contour level	0.35	Depositor
Map size (Å)	444.4032, 444.4032, 444.4032	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1573, 1.1573, 1.1573	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, 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	0.18	0/24093	0.32	0/32651

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	4195	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	23657	315	0
2	A	81	0	36	3	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	2	0	0	0	0
All	All	23707	0	23705	317	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 7.

All (317) 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:2221:MET:HG2	1:A:2343:PHE:HB2	1.55	0.89
1:A:2629:GLU:OE2	1:A:2633:LYS:NZ	2.12	0.83
1:A:4271:ARG:HD3	1:A:4633:ARG:HH12	1.43	0.82
1:A:1490:TRP:HH2	1:A:1537:TRP:HD1	1.29	0.79
1:A:4088:VAL:HG11	1:A:4116:LEU:HD21	1.67	0.76
1:A:1571:ILE:HD13	1:A:1607:LEU:HB3	1.69	0.74
1:A:2149:LEU:HD11	1:A:2157:LEU:HD13	1.68	0.74
1:A:1490:TRP:CH2	1:A:1537:TRP:HD1	2.08	0.72
1:A:2788:THR:HG22	1:A:2789:GLN:HG2	1.72	0.72
1:A:4037:PRO:HB2	1:A:4118:PRO:HG2	1.71	0.71
1:A:2562:VAL:O	1:A:2804:ARG:NH1	2.21	0.71
1:A:2581:LEU:HD11	1:A:2593:LEU:HD21	1.72	0.71
1:A:2930:GLN:HG3	1:A:3059:ILE:HG23	1.73	0.71
1:A:4190:ILE:HD12	1:A:4201:TRP:HZ2	1.56	0.71
1:A:4549:GLN:HG3	1:A:4587:LEU:HB2	1.73	0.70
1:A:1466:ILE:HG12	1:A:1500:HIS:HD1	1.57	0.69
1:A:4197:ALA:HB3	1:A:4198:PRO:HD3	1.75	0.67
1:A:2444:GLU:H	1:A:2510:MET:HE3	1.61	0.66
1:A:3661:LEU:HD12	1:A:3668:ASP:HB2	1.76	0.65
1:A:2775:GLU:OE1	1:A:2857:HIS:NE2	2.24	0.64
1:A:2906:ASP:OD2	1:A:3655:ARG:NH1	2.29	0.64
1:A:2452:LEU:HD13	1:A:2729:ARG:HH21	1.63	0.64
1:A:3638:VAL:HG12	1:A:3681:THR:HB	1.79	0.64
1:A:2138:ILE:HD12	1:A:2161:LEU:HD22	1.79	0.64
1:A:2536:ASP:OD1	1:A:2576:ARG:NH1	2.31	0.63
1:A:4097:LYS:HA	1:A:4127:THR:HB	1.79	0.63
1:A:4176:ARG:NH1	1:A:4220:ASP:OD2	2.27	0.62
1:A:1487:ILE:HD12	1:A:1537:TRP:NE1	2.14	0.62
1:A:1908:ALA:HB3	1:A:2353:LEU:HD22	1.81	0.62
1:A:2080:LEU:O	1:A:4415:ARG:NH1	2.33	0.62
3:A:4702:ATP:H8	3:A:4702:ATP:H5'1	1.64	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3557:ASP:OD1	1:A:3743:ARG:NH1	2.32	0.62
3:A:4702:ATP:H5'1	3:A:4702:ATP:C8	2.34	0.62
1:A:1490:TRP:HH2	1:A:1537:TRP:CD1	2.17	0.61
1:A:1751:VAL:HG21	1:A:1878:LYS:HE3	1.83	0.61
1:A:2226:SER:HA	3:A:4702:ATP:O1G	2.00	0.61
1:A:2905:LEU:HD11	1:A:3652:GLU:HB3	1.83	0.60
1:A:2457:SER:HB2	1:A:2732:PRO:HB3	1.82	0.60
1:A:3761:LEU:HA	1:A:3767:ILE:HD11	1.82	0.60
1:A:4436:GLN:HG3	1:A:4441:LYS:HB2	1.84	0.60
1:A:2488:ARG:HG3	1:A:2492:ARG:HH12	1.65	0.59
1:A:3510:SER:HB3	1:A:3553:LEU:HD21	1.85	0.59
1:A:4287:LYS:H	1:A:4293:ASP:HB3	1.68	0.59
1:A:1466:ILE:HG12	1:A:1500:HIS:ND1	2.17	0.59
1:A:1623:ARG:HD3	1:A:1630:TYR:HA	1.84	0.59
1:A:3909:LEU:HD21	1:A:4343:MET:HE2	1.84	0.59
1:A:4318:PRO:HG2	1:A:4325:ASN:HA	1.85	0.59
1:A:2562:VAL:HG11	1:A:2755:MET:HB2	1.85	0.58
1:A:2841:GLU:OE1	1:A:2844:ARG:NH1	2.36	0.58
1:A:2356:VAL:HG13	1:A:2361:MET:HE3	1.84	0.58
1:A:2279:LEU:HA	1:A:2698:GLN:HG3	1.86	0.58
1:A:2422:ILE:HD13	1:A:2487:GLU:HA	1.85	0.58
1:A:3951:VAL:CG2	1:A:3973:LEU:HD21	2.33	0.58
1:A:2039:LEU:HD12	1:A:4254:GLY:HA2	1.84	0.58
1:A:4071:ILE:HD11	1:A:4096:LEU:HB3	1.86	0.57
1:A:3597:THR:HG23	1:A:3634:LEU:HD21	1.86	0.57
1:A:3655:ARG:HG2	1:A:3660:VAL:HG22	1.86	0.57
1:A:4544:ASN:HD22	1:A:4589:GLN:HG3	1.70	0.57
1:A:2107:ARG:NH2	1:A:2139:GLN:OE1	2.38	0.57
1:A:3839:VAL:HG21	1:A:3863:LEU:HA	1.85	0.57
1:A:1931:ASN:HD22	1:A:2317:SER:H	1.51	0.56
1:A:2449:LEU:HD11	1:A:2454:CYS:SG	2.46	0.56
1:A:1567:ARG:O	1:A:1571:ILE:HG13	2.05	0.56
1:A:3951:VAL:HG22	1:A:3973:LEU:HD21	1.87	0.56
1:A:4168:ARG:NE	1:A:4220:ASP:OD1	2.30	0.56
1:A:1985:HIS:CD2	1:A:1997:ILE:HD13	2.41	0.56
1:A:3601:MET:HG3	1:A:3611:ARG:NH2	2.21	0.56
1:A:3891:LYS:HD2	1:A:4013:LEU:HD23	1.87	0.56
1:A:2433:VAL:HG22	1:A:2498:ILE:HD11	1.87	0.56
1:A:4444:GLN:O	1:A:4449:ARG:NH1	2.38	0.56
1:A:1537:TRP:CE3	1:A:1601:LEU:HD11	2.41	0.56
1:A:4554:ASP:OD1	1:A:4555:ALA:N	2.37	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3172:THR:HG21	1:A:3694:SER:HB3	1.88	0.55
1:A:4071:ILE:HG13	1:A:4099:VAL:HG12	1.87	0.55
1:A:2319:LEU:HD13	1:A:2359:CYS:SG	2.45	0.55
1:A:4104:GLY:HA2	1:A:4107:MET:HE3	1.88	0.55
1:A:2573:ASP:OD1	1:A:2576:ARG:NH2	2.40	0.55
1:A:1998:THR:HG21	1:A:2005:GLN:HB3	1.88	0.55
1:A:2047:GLN:HA	1:A:2070:VAL:HG21	1.89	0.54
1:A:2144:THR:HG22	1:A:2145:MET:HE2	1.89	0.54
1:A:2694:ARG:NH1	1:A:2697:ASP:OD2	2.40	0.54
1:A:1543:ARG:NH1	1:A:1612:GLN:OE1	2.41	0.53
1:A:2665:GLU:HB3	1:A:2668:LEU:HD12	1.90	0.53
1:A:3914:ILE:O	1:A:3937:ARG:NH1	2.42	0.53
1:A:2596:PRO:HB2	1:A:2738:TYR:CZ	2.43	0.53
1:A:3580:LEU:HD13	1:A:3600:ILE:HD11	1.89	0.53
1:A:3916:LEU:HD11	1:A:3937:ARG:HG3	1.91	0.53
1:A:1571:ILE:HD12	1:A:1611:ILE:HD11	1.90	0.53
1:A:1887:ARG:HE	1:A:2039:LEU:HD11	1.74	0.53
1:A:1487:ILE:HD12	1:A:1537:TRP:HE1	1.73	0.53
1:A:3044:LEU:HD22	1:A:3049:GLU:HB3	1.90	0.53
1:A:3750:LEU:O	1:A:3754:ASN:ND2	2.42	0.53
1:A:3691:ASP:OD1	1:A:3692:LEU:N	2.42	0.52
1:A:2621:ASN:OD1	1:A:3014:ASN:ND2	2.43	0.52
1:A:4196:TYR:O	1:A:4197:ALA:C	2.52	0.52
1:A:1832:ASN:HD21	1:A:1834:LYS:HB2	1.72	0.52
1:A:2620:LEU:HD22	1:A:2631:LEU:HD23	1.91	0.52
1:A:1687:LYS:HD3	1:A:1712:THR:HG23	1.91	0.52
1:A:4209:GLU:OE2	1:A:4213:ARG:NE	2.36	0.52
1:A:1929:VAL:H	1:A:2332:ARG:NH2	2.09	0.51
1:A:1965:GLU:HG2	1:A:2026:SER:HB3	1.91	0.51
1:A:3182:HIS:NE2	1:A:3582:ARG:O	2.40	0.51
1:A:1467:ARG:HE	1:A:1523:TRP:HZ2	1.56	0.51
1:A:2835:ASP:HB3	1:A:3092:ASN:HD22	1.74	0.51
1:A:2973:ASP:OD2	1:A:3007:ARG:NH2	2.43	0.51
1:A:3194:LEU:HD23	1:A:3500:MET:SD	2.51	0.51
1:A:4179:LEU:HD12	1:A:4223:LEU:HD22	1.92	0.51
1:A:3520:PHE:HB3	1:A:3524:MET:HB3	1.91	0.51
1:A:4413:PHE:HD2	1:A:4504:LEU:HD13	1.75	0.51
1:A:4517:PRO:HG3	1:A:4611:LEU:HD13	1.93	0.51
1:A:4178:ARG:NH2	1:A:4297:PRO:O	2.43	0.51
1:A:4460:LEU:HD12	1:A:4461:PRO:HD2	1.93	0.51
1:A:3750:LEU:HG	1:A:3754:ASN:HD21	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1671:SER:HB2	1:A:1693:THR:HG23	1.92	0.50
1:A:2487:GLU:O	1:A:2491:GLN:HG3	2.11	0.50
1:A:3624:GLU:HG3	1:A:3669:ILE:HD13	1.93	0.50
1:A:2807:PHE:CE2	1:A:2811:ARG:HD3	2.46	0.50
1:A:2211:TYR:O	1:A:2214:THR:OG1	2.29	0.50
1:A:1929:VAL:H	1:A:2332:ARG:HH21	1.59	0.50
1:A:2224:GLY:O	1:A:2346:GLN:HA	2.12	0.50
1:A:4009:VAL:HG13	1:A:4013:LEU:HD12	1.92	0.50
1:A:1860:GLN:HG2	1:A:1865:LYS:HG2	1.93	0.50
1:A:2294:GLU:OE1	1:A:2294:GLU:N	2.39	0.50
1:A:3211:THR:HG23	1:A:3761:LEU:HD11	1.93	0.50
1:A:1575:PHE:O	1:A:1579:MET:HG2	2.12	0.49
1:A:2638:TYR:HB3	1:A:2659:LEU:HD11	1.93	0.49
1:A:2917:ASP:OD2	1:A:2921:ARG:NH2	2.45	0.49
1:A:1929:VAL:HG13	1:A:1958:ASP:OD2	2.12	0.49
1:A:2538:GLU:HB3	1:A:2548:TRP:CE2	2.48	0.49
1:A:2773:MET:HE2	1:A:2802:TRP:CG	2.48	0.49
1:A:2564:ALA:HB3	1:A:2567:VAL:HG23	1.94	0.49
1:A:2773:MET:HB3	1:A:2799:MET:HE1	1.94	0.49
1:A:4180:TYR:OH	1:A:4220:ASP:OD1	2.31	0.49
1:A:4387:TRP:CD1	1:A:4479:VAL:HG11	2.47	0.49
1:A:1914:GLU:HG2	2:A:4701:ADP:O1A	2.13	0.49
1:A:2174:GLU:OE1	1:A:2176:THR:OG1	2.30	0.49
1:A:2374:ILE:HD13	1:A:2452:LEU:HD21	1.95	0.49
1:A:4403:GLU:HA	1:A:4406:LYS:HE2	1.95	0.49
1:A:2061:THR:OG1	1:A:2133:GLU:OE1	2.28	0.49
1:A:2994:MET:HE1	1:A:3008:MET:HG3	1.95	0.49
1:A:1556:ASP:OD2	1:A:1621:ARG:NH2	2.43	0.48
1:A:4043:MET:HB3	1:A:4051:ALA:HB3	1.95	0.48
1:A:4436:GLN:HG2	1:A:4442:LYS:HG2	1.95	0.48
1:A:1647:VAL:HG21	1:A:1670:ASN:HB3	1.95	0.48
1:A:2069:ILE:HB	1:A:2137:LEU:HD21	1.96	0.48
1:A:1959:GLU:HB3	1:A:1962:ARG:HG3	1.96	0.48
1:A:3944:PHE:CE1	1:A:3974:TRP:HB3	2.48	0.48
1:A:2869:ARG:HA	1:A:2869:ARG:NE	2.28	0.48
1:A:2445:HIS:NE2	1:A:2449:LEU:HD22	2.28	0.48
1:A:4251:ILE:HG22	1:A:4252:TYR:CD2	2.49	0.48
1:A:2443:LEU:HD21	1:A:2513:GLU:OE1	2.14	0.47
1:A:3485:GLU:OE2	1:A:3774:LYS:NZ	2.43	0.47
1:A:2445:HIS:HB3	1:A:2505:ASP:OD2	2.15	0.47
1:A:4400:ARG:HE	1:A:4405:ILE:HD11	1.78	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1761:ASN:HB3	1:A:1781:VAL:HG22	1.96	0.47
1:A:1931:ASN:HD21	1:A:2316:ASN:HB2	1.79	0.47
1:A:3030:MET:HE2	1:A:3030:MET:HA	1.97	0.47
1:A:3175:HIS:CD2	1:A:3585:ARG:HH22	2.32	0.47
1:A:3835:ILE:HG12	1:A:3870:ARG:HD2	1.95	0.47
1:A:2138:ILE:HD11	1:A:2165:PHE:CG	2.50	0.47
1:A:2751:PHE:HB3	1:A:2803:VAL:HG11	1.96	0.47
1:A:3950:LYS:HB3	1:A:3973:LEU:CD1	2.43	0.47
1:A:2386:PRO:HG3	1:A:2413:LEU:HD13	1.97	0.47
1:A:2850:ILE:HG22	1:A:2867:MET:HE1	1.95	0.47
1:A:3731:LEU:HD11	1:A:3790:VAL:HG12	1.96	0.47
1:A:4628:THR:OG1	1:A:4630:GLU:HG2	2.15	0.47
1:A:2134:GLN:O	1:A:2138:ILE:HG12	2.15	0.47
1:A:4175:GLU:OE1	1:A:4175:GLU:N	2.48	0.47
1:A:2175:MET:HE3	1:A:2208:LEU:HD22	1.97	0.46
1:A:2592:VAL:HG23	1:A:2731:VAL:HG11	1.97	0.46
1:A:3703:VAL:HG21	1:A:3829:LEU:HD22	1.97	0.46
1:A:1623:ARG:NH1	1:A:1632:VAL:O	2.48	0.46
1:A:3966:PRO:HG3	1:A:3997:ARG:HG3	1.97	0.46
1:A:2590:PRO:O	1:A:2732:PRO:HD2	2.15	0.46
1:A:3110:THR:O	1:A:3140:ARG:NH1	2.49	0.46
1:A:1721:VAL:HA	1:A:1724:VAL:HG12	1.98	0.46
1:A:2790:PRO:HB3	1:A:3076:LYS:HG2	1.98	0.46
1:A:1937:ASP:HA	1:A:1967:MET:HG3	1.98	0.46
1:A:2994:MET:HE3	1:A:3066:PHE:HE1	1.81	0.46
1:A:3117:LYS:HE2	1:A:3139:HIS:CD2	2.51	0.46
1:A:3553:LEU:HB2	1:A:3578:ILE:HD13	1.97	0.46
1:A:3921:THR:HG21	1:A:3933:GLU:HG2	1.98	0.46
1:A:4172:SER:HB2	1:A:4173:PRO:HD3	1.99	0.46
1:A:2961:ILE:HD11	1:A:2998:ASN:HB3	1.98	0.45
1:A:3175:HIS:HB3	1:A:3516:TYR:CE1	2.50	0.45
1:A:4087:ALA:HA	1:A:4092:ARG:HB3	1.99	0.45
1:A:1879:LEU:HD22	2:A:4701:ADP:C4	2.52	0.45
1:A:2688:GLU:OE1	1:A:2689:HIS:CE1	2.69	0.45
1:A:2179:ARG:NH2	1:A:2195:ASP:OD1	2.43	0.45
1:A:2912:PHE:CE2	1:A:2914:GLU:HB2	2.52	0.45
1:A:4423:LEU:HD13	1:A:4466:HIS:ND1	2.31	0.45
1:A:1931:ASN:ND2	1:A:2316:ASN:HB2	2.31	0.45
1:A:2851:ASP:HA	1:A:2867:MET:HE3	1.99	0.45
1:A:4517:PRO:HG2	1:A:4619:ILE:HD12	1.98	0.45
1:A:4415:ARG:HE	1:A:4415:ARG:HB3	1.54	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2668:LEU:HD21	1:A:2720:ARG:CZ	2.47	0.45
1:A:4100:HIS:HB3	1:A:4128:MET:HB2	1.99	0.45
1:A:1635:GLU:HA	1:A:1638:LEU:HD12	1.98	0.45
1:A:2963:VAL:HG23	1:A:3643:PRO:HB2	1.99	0.45
1:A:4185:TRP:O	1:A:4189:ILE:HG12	2.18	0.44
1:A:3601:MET:HG3	1:A:3611:ARG:HH21	1.80	0.44
1:A:4189:ILE:O	1:A:4193:ARG:HG3	2.17	0.44
1:A:1697:LYS:HB3	1:A:1700:GLU:OE1	2.18	0.44
1:A:3217:GLU:HB2	1:A:3220:ARG:HH21	1.82	0.44
1:A:2975:ASP:O	1:A:2979:VAL:HG23	2.18	0.44
1:A:3232:LYS:HA	1:A:3232:LYS:HD3	1.76	0.44
1:A:4160:THR:HG23	1:A:4212:LEU:HD21	1.99	0.44
1:A:1980:GLU:OE2	1:A:1983:ARG:NH1	2.51	0.44
1:A:2437:LEU:HD21	1:A:2451:ARG:HG3	2.00	0.44
1:A:2548:TRP:CD1	1:A:2576:ARG:HG2	2.53	0.44
1:A:3485:GLU:HG3	1:A:3488:ARG:HH22	1.83	0.44
1:A:4412:PHE:HZ	1:A:4514:LEU:HD13	1.82	0.44
1:A:2079:GLN:HB2	1:A:2160:LEU:HD11	2.00	0.44
1:A:4186:PHE:O	1:A:4190:ILE:HG12	2.18	0.44
1:A:1625:SER:HB2	1:A:1699:ASN:ND2	2.33	0.43
1:A:2290:SER:HB2	1:A:2295:LEU:HG	1.99	0.43
1:A:3096:ASP:OD1	1:A:3097:TRP:N	2.50	0.43
1:A:4401:THR:O	1:A:4405:ILE:HG12	2.17	0.43
1:A:1623:ARG:NH1	1:A:1629:PHE:O	2.47	0.43
1:A:3910:ARG:HE	1:A:3913:GLU:CD	2.27	0.43
1:A:4227:ALA:HB2	1:A:4233:ILE:HD12	2.01	0.43
1:A:1724:VAL:HG11	1:A:1753:SER:HB3	2.00	0.43
1:A:1997:ILE:H	1:A:1997:ILE:HD12	1.83	0.43
1:A:3160:ARG:O	1:A:3163:LYS:HG2	2.17	0.43
1:A:4034:GLU:OE1	1:A:4143:ARG:NH1	2.41	0.43
1:A:4415:ARG:O	1:A:4419:MET:HG2	2.18	0.43
1:A:1666:LEU:HD23	1:A:1673:VAL:HA	2.00	0.43
1:A:2457:SER:O	1:A:2461:MET:HG3	2.18	0.43
1:A:2994:MET:HG3	1:A:2998:ASN:HD22	1.84	0.43
1:A:2776:PHE:HZ	1:A:2846:THR:HG23	1.83	0.43
1:A:3880:HIS:ND1	1:A:4021:MET:HG3	2.33	0.43
1:A:1834:LYS:HA	1:A:1834:LYS:HD3	1.88	0.43
1:A:2538:GLU:HB3	1:A:2548:TRP:CZ2	2.54	0.43
1:A:4173:PRO:HD2	1:A:4176:ARG:HH21	1.84	0.43
1:A:4611:LEU:HB2	1:A:4619:ILE:HD11	2.00	0.43
1:A:3936:VAL:O	1:A:3939:SER:OG	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3148:VAL:O	1:A:3152:GLN:HG3	2.19	0.43
1:A:3154:LEU:HG	1:A:3516:TYR:CD1	2.54	0.43
1:A:2028:LEU:HG	1:A:2032:LEU:HD23	1.99	0.42
1:A:2961:ILE:HG13	1:A:2963:VAL:HG13	2.00	0.42
1:A:4234:SER:OG	1:A:4236:ASP:OD1	2.31	0.42
1:A:4297:PRO:HB3	1:A:4308:TRP:CD1	2.54	0.42
1:A:4437:VAL:HG21	1:A:4448:LEU:HD13	2.00	0.42
1:A:3514:ILE:HD11	1:A:3553:LEU:HD13	2.00	0.42
1:A:3745:LEU:HD13	1:A:3777:ALA:HA	2.01	0.42
1:A:4196:TYR:CZ	1:A:4318:PRO:HB3	2.54	0.42
1:A:1853:VAL:HA	1:A:1856:GLN:HG3	2.01	0.42
1:A:2230:LYS:HG2	1:A:2364:PHE:CG	2.54	0.42
1:A:2825:TRP:CZ3	1:A:2854:ALA:HB2	2.55	0.42
1:A:2882:ILE:HB	1:A:2883:PRO:HD2	2.01	0.42
1:A:3194:LEU:HD21	1:A:3499:GLN:HB2	2.01	0.42
1:A:2488:ARG:CG	1:A:2492:ARG:HH12	2.32	0.42
1:A:2557:VAL:O	1:A:2757:ARG:NH2	2.52	0.42
1:A:2446:ILE:HD12	1:A:2446:ILE:HA	1.92	0.42
1:A:4412:PHE:CZ	1:A:4520:TYR:HB2	2.55	0.42
1:A:4546:THR:HG21	1:A:4589:GLN:HE21	1.84	0.42
1:A:1490:TRP:HZ3	1:A:1534:PHE:HB3	1.83	0.42
1:A:2784:PHE:HB3	1:A:2792:TYR:CD2	2.54	0.42
1:A:3558:GLU:HG2	1:A:3562:TRP:CE2	2.54	0.42
1:A:1738:TYR:HE2	1:A:1792:LEU:HD21	1.85	0.41
1:A:2059:PHE:CZ	1:A:2104:LYS:HD3	2.55	0.41
1:A:3110:THR:O	1:A:3113:MET:HB2	2.19	0.41
1:A:2163:ASP:OD1	1:A:4530:GLN:NE2	2.54	0.41
1:A:2221:MET:HE1	1:A:2355:THR:HG22	2.02	0.41
1:A:2864:GLU:O	1:A:2868:SER:OG	2.30	0.41
1:A:4106:LEU:HD23	1:A:4106:LEU:HA	1.93	0.41
1:A:4423:LEU:HD22	1:A:4466:HIS:HB2	2.01	0.41
1:A:4553:LEU:HD23	1:A:4553:LEU:HA	1.87	0.41
1:A:1526:LYS:O	1:A:1530:ILE:HG13	2.20	0.41
1:A:1623:ARG:NH2	1:A:1634:ASP:OD1	2.54	0.41
1:A:2107:ARG:HD2	1:A:2136:ILE:HG12	2.02	0.41
1:A:3862:ASP:OD1	1:A:3866:VAL:HG23	2.20	0.41
1:A:4190:ILE:HD12	1:A:4201:TRP:CZ2	2.45	0.41
1:A:1475:LEU:HD12	1:A:1591:VAL:HG21	2.02	0.41
1:A:1895:ALA:HB2	1:A:2037:ARG:HB2	2.02	0.41
1:A:2070:VAL:HB	1:A:2071:PRO:HD3	2.02	0.41
1:A:3017:VAL:HB	1:A:3020:LEU:HB2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2471:GLN:HE21	1:A:2471:GLN:HB3	1.73	0.41
1:A:3115:LEU:HD13	1:A:3143:ILE:HG21	2.01	0.41
1:A:3955:GLU:H	1:A:3955:GLU:CD	2.28	0.41
1:A:2581:LEU:HD12	1:A:2604:THR:HG22	2.02	0.41
1:A:2667:ASN:OD1	1:A:2712:CYS:HB2	2.20	0.41
1:A:3584:ASN:O	1:A:3651:ARG:NH2	2.53	0.41
1:A:3716:VAL:HB	1:A:3836:TYR:OH	2.20	0.41
1:A:3908:PHE:HE1	1:A:4001:LEU:HD11	1.86	0.41
1:A:3951:VAL:HG23	1:A:3973:LEU:HD21	2.01	0.41
1:A:2912:PHE:HE2	1:A:2914:GLU:HB2	1.86	0.41
1:A:2206:LYS:HA	1:A:2206:LYS:HD3	1.86	0.41
1:A:3912:ASN:O	1:A:3937:ARG:NH1	2.54	0.41
1:A:1508:LYS:HG2	1:A:1513:TYR:CZ	2.56	0.41
1:A:1899:ARG:N	1:A:1899:ARG:HD2	2.34	0.41
1:A:2582:TYR:CE2	1:A:2612:LEU:HD13	2.56	0.41
1:A:3985:GLN:HB3	1:A:3989:ARG:NH1	2.36	0.41
1:A:1478:VAL:CG2	1:A:1488:ARG:HH21	2.34	0.41
1:A:1486:LEU:HD23	1:A:1579:MET:HE2	2.03	0.41
1:A:2132:PRO:HB2	1:A:2135:GLU:HB3	2.02	0.41
1:A:3157:ALA:HB1	1:A:3524:MET:HE2	2.03	0.41
1:A:4424:LEU:HD13	1:A:4486:ILE:HG13	2.03	0.41
1:A:4534:TRP:CD2	1:A:4594:LYS:HD3	2.56	0.41
1:A:2290:SER:HA	1:A:2294:GLU:OE1	2.21	0.40
1:A:3588:LEU:HD21	1:A:3638:VAL:HG11	2.02	0.40
1:A:3821:ILE:HB	1:A:4342:LYS:HG2	2.04	0.40
1:A:4150:PRO:O	1:A:4195:ARG:NH2	2.53	0.40
1:A:2091:ARG:NH1	2:A:4701:ADP:H5'2	2.36	0.40
1:A:2353:LEU:C	1:A:2353:LEU:HD23	2.46	0.40
1:A:3133:LEU:HD11	1:A:3141:GLU:HB3	2.03	0.40
1:A:4099:VAL:HG23	1:A:4106:LEU:HD11	2.02	0.40
1:A:4260:PHE:HD1	1:A:4263:ARG:NH2	2.19	0.40
1:A:1744:LYS:HD3	1:A:1745:TYR:CE2	2.55	0.40
1:A:3113:MET:HE3	1:A:3184:ALA:HA	2.02	0.40
1:A:3229:LEU:HD12	1:A:3465:LEU:HD13	2.03	0.40
1:A:4002:LEU:HD11	1:A:4335:GLN:HB3	2.04	0.40
1:A:2925:ILE:HG13	1:A:2933:LEU:HD21	2.03	0.40
1:A:3001:ASP:OD1	1:A:3002:SER:N	2.54	0.40
1:A:3731:LEU:HD11	1:A:3790:VAL:CG1	2.52	0.40
1:A:3740:LEU:O	1:A:3744:GLN:HG3	2.20	0.40
1:A:3741:ARG:NH2	1:A:3776:GLU:OE1	2.53	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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%)	2882 (98%)	45 (2%)	2 (0%)	48 69

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4197	ALA
1	A	4198	PRO

5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	2605/4125 (63%)	2605 (100%)	0	100 100

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

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (42) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1465	GLN
1	A	1559	HIS
1	A	1569	GLN
1	A	1643	ASN
1	A	1646	ASN
1	A	1670	ASN
1	A	1855	GLN

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Mol	Chain	Res	Type
1	A	1894	GLN
1	A	1931	ASN
1	A	1974	GLN
1	A	1976	GLN
1	A	2067	ASN
1	A	2171	HIS
1	A	2296	GLN
1	A	2463	HIS
1	A	2464	GLN
1	A	2471	GLN
1	A	2475	ASN
1	A	2554	GLN
1	A	2685	GLN
1	A	2713	ASN
1	A	2930	GLN
1	A	3069	ASN
1	A	3092	ASN
1	A	3200	HIS
1	A	3214	GLN
1	A	3523	GLN
1	A	3526	GLN
1	A	3602	ASN
1	A	3636	GLN
1	A	3735	GLN
1	A	3754	ASN
1	A	3877	HIS
1	A	3878	GLN
1	A	3956	GLN
1	A	4054	HIS
1	A	4335	GLN
1	A	4425	GLN
1	A	4429	GLN
1	A	4453	ASN
1	A	4532	ASN
1	A	4566	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [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 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	ATP	A	4702	4	28,33,33	0.76	0	34,52,52	0.79	1 (2%)
2	ADP	A	4703	-	24,29,29	0.74	0	29,45,45	0.73	1 (3%)
2	ADP	A	4704	-	24,29,29	0.74	0	29,45,45	0.75	1 (3%)
2	ADP	A	4701	4	24,29,29	0.73	0	29,45,45	0.74	1 (3%)

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

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

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	4704	ADP	C5-C6-N6	2.34	123.87	120.31
2	A	4701	ADP	C5-C6-N6	2.31	123.83	120.31
2	A	4703	ADP	C5-C6-N6	2.25	123.74	120.31
3	A	4702	ATP	C5-C6-N6	2.24	123.73	120.31

There are no chirality outliers.

All (5) torsion outliers are listed below:

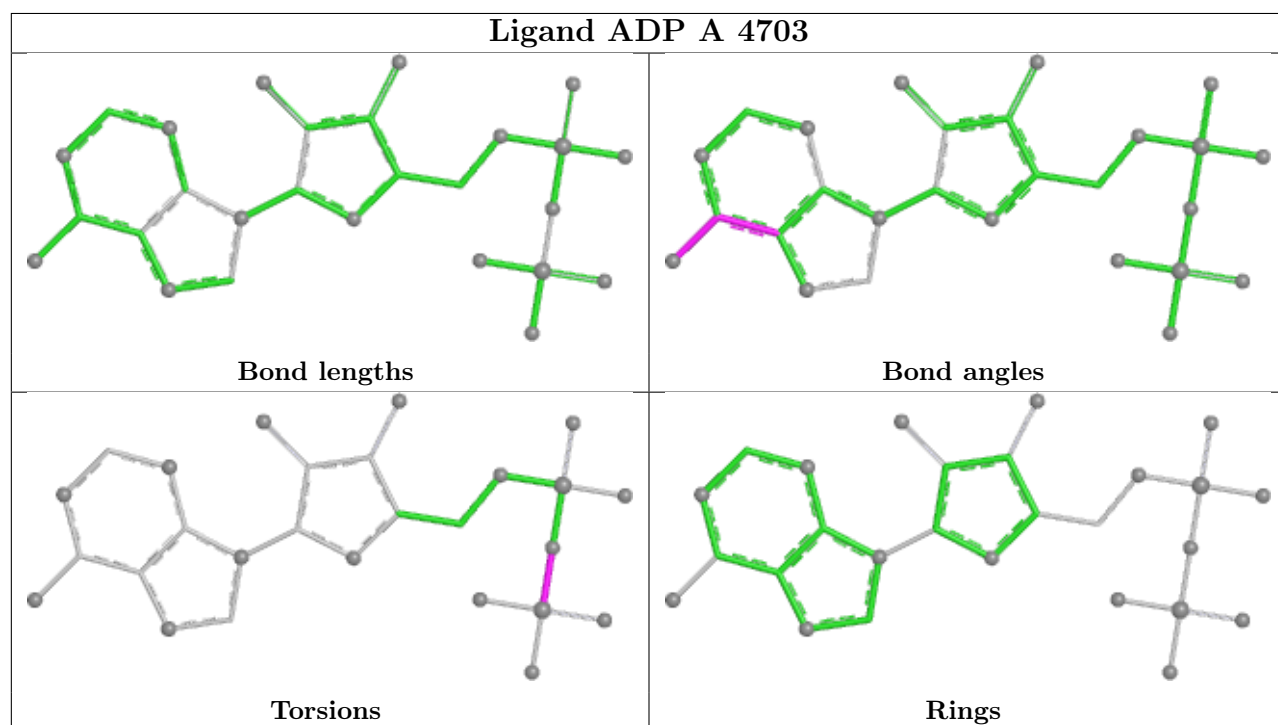
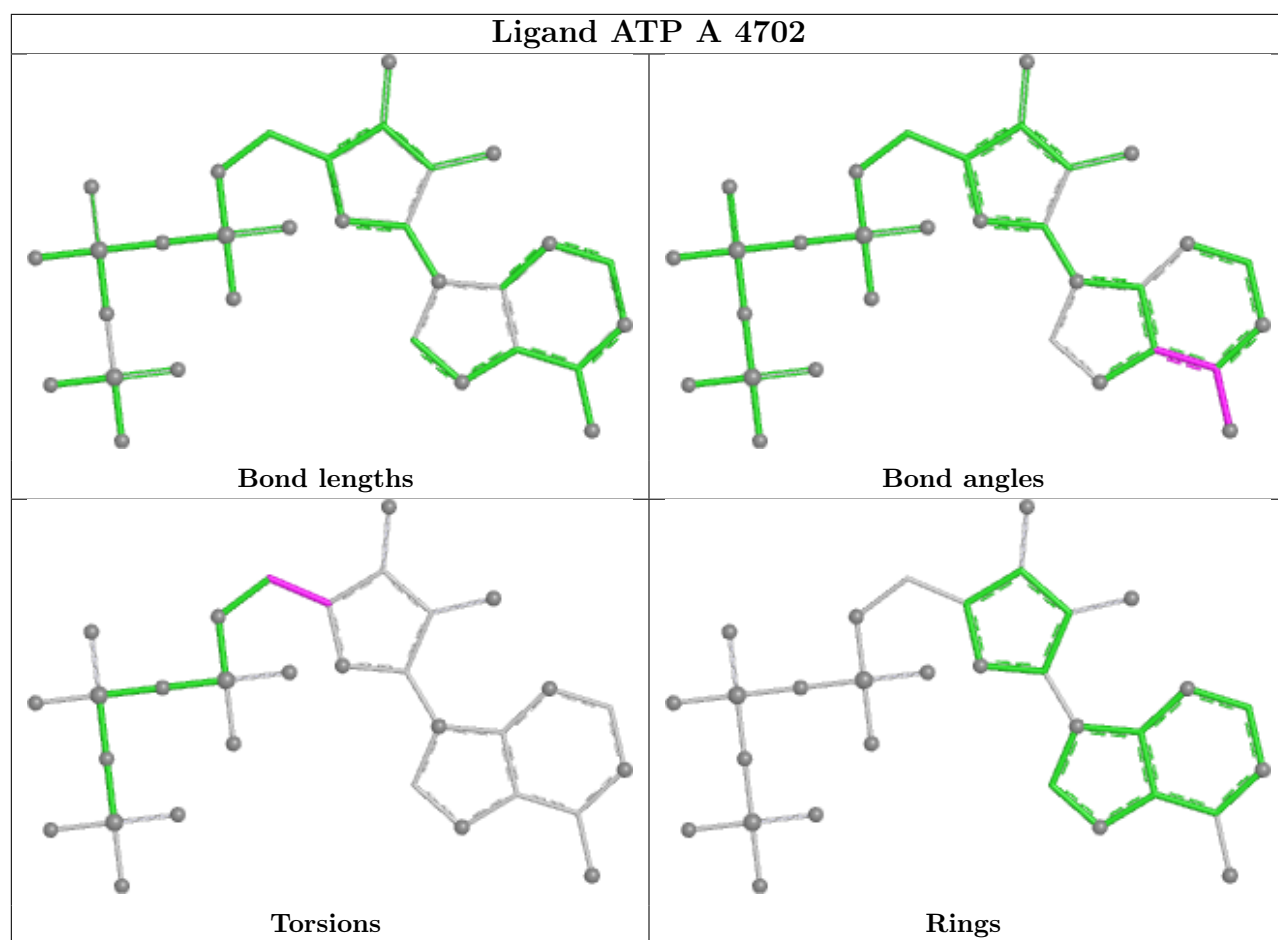
Mol	Chain	Res	Type	Atoms
2	A	4704	ADP	PA-O3A-PB-O2B
3	A	4702	ATP	O4'-C4'-C5'-O5'
2	A	4704	ADP	PA-O3A-PB-O1B
3	A	4702	ATP	C3'-C4'-C5'-O5'
2	A	4703	ADP	PA-O3A-PB-O3B

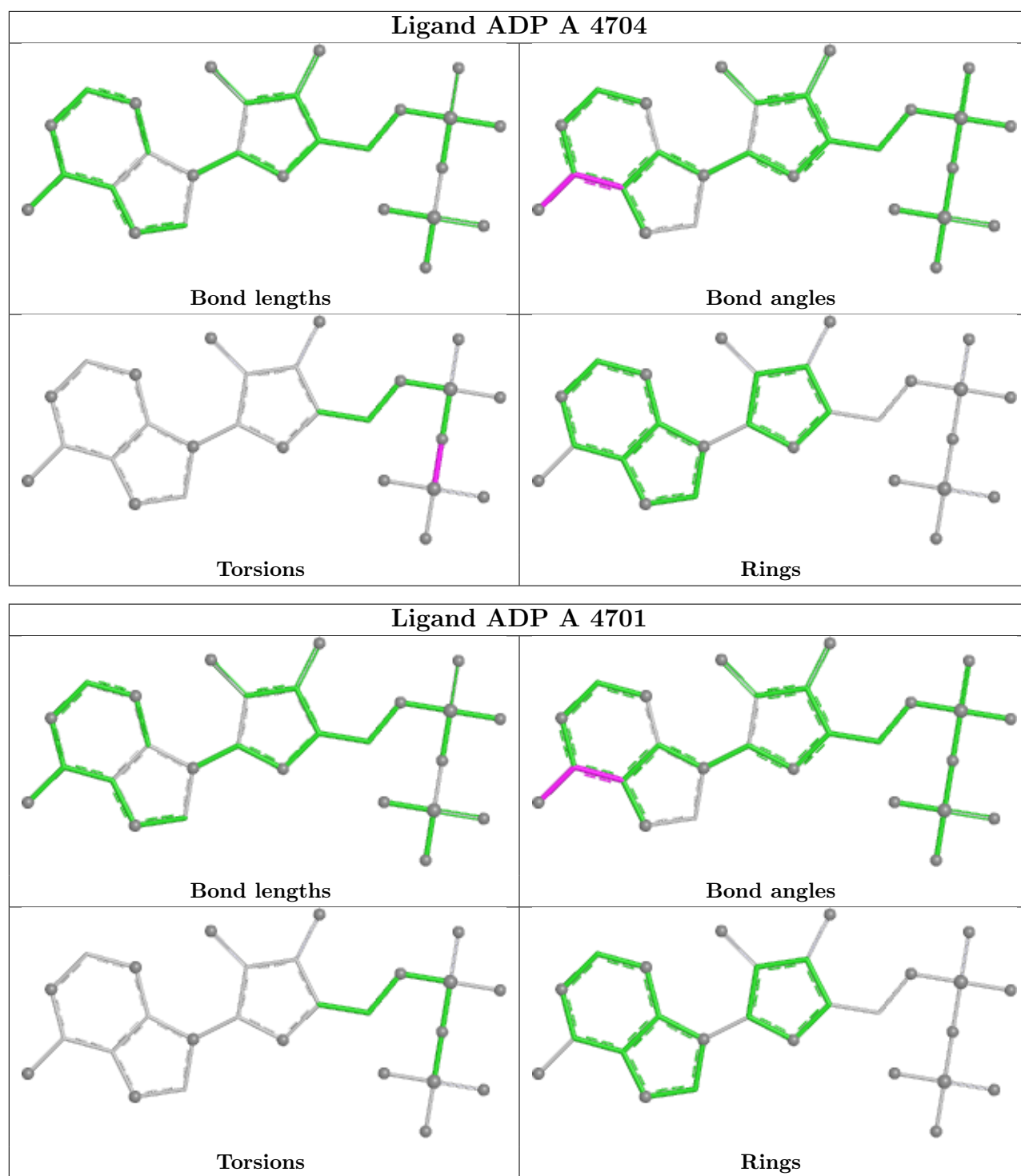
There are no ring outliers.

2 monomers are involved in 6 short contacts:

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

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





5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

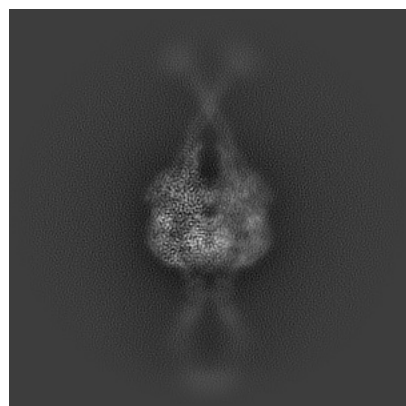
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44715. These allow visual inspection of the internal detail of the map and identification of artifacts.

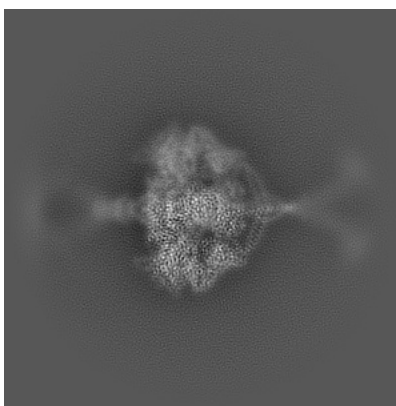
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

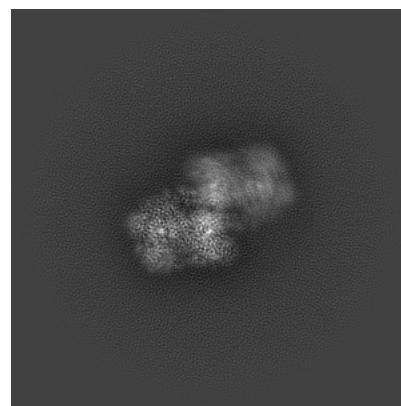
6.1.1 Primary map



X

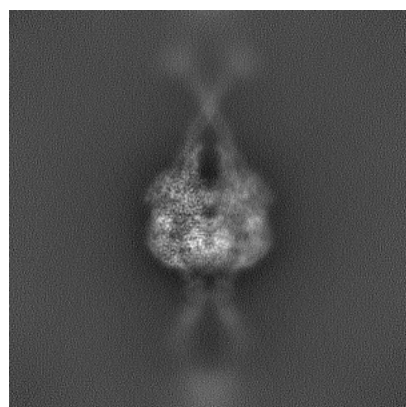


Y

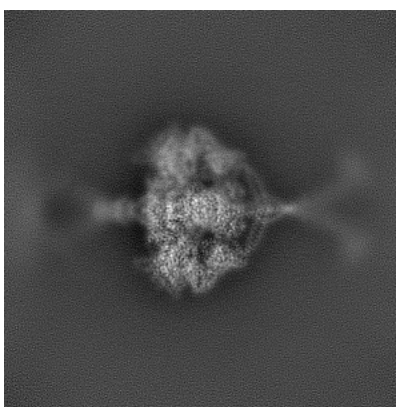


Z

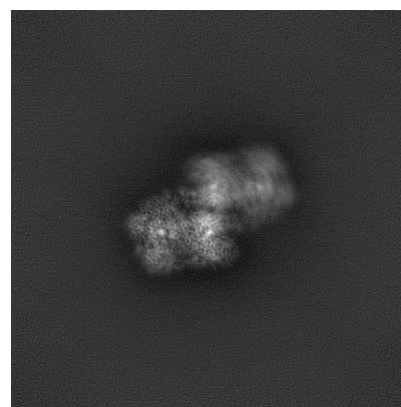
6.1.2 Raw map



X



Y

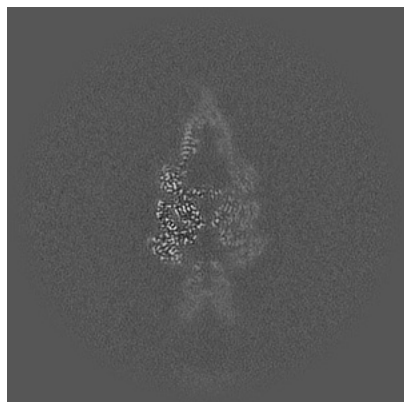


Z

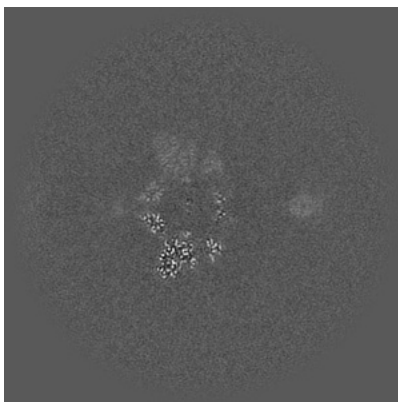
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 192

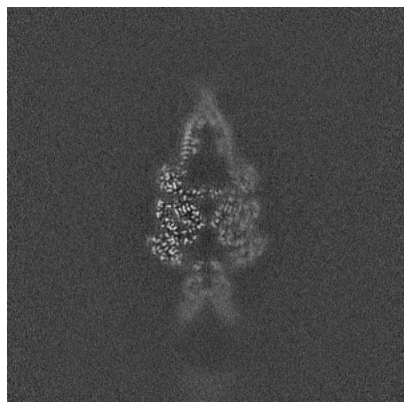


Y Index: 192

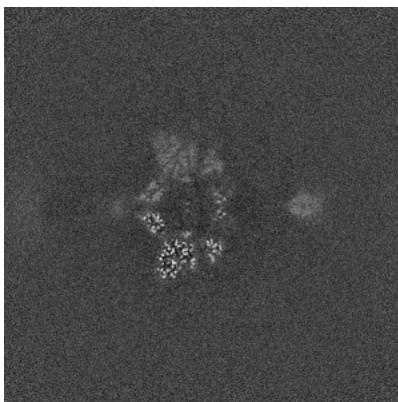


Z Index: 192

6.2.2 Raw map



X Index: 192



Y Index: 192

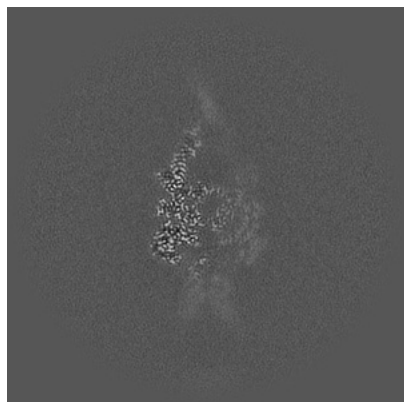


Z Index: 192

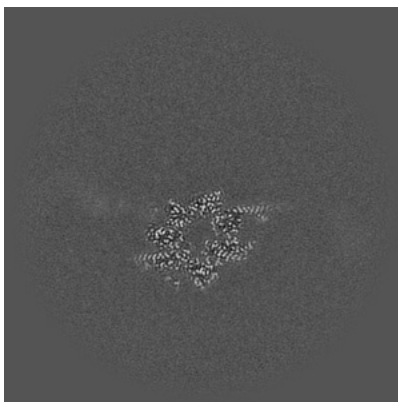
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

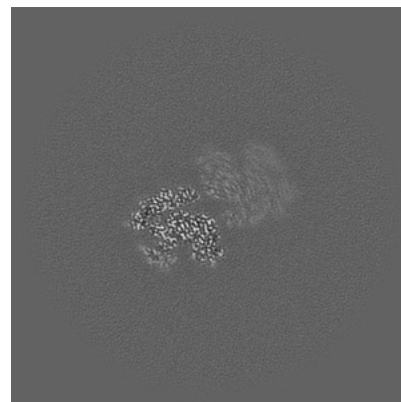
6.3.1 Primary map



X Index: 187

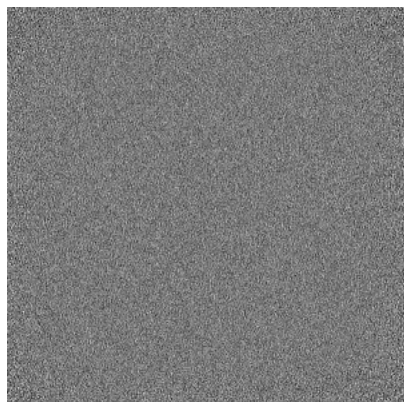


Y Index: 169

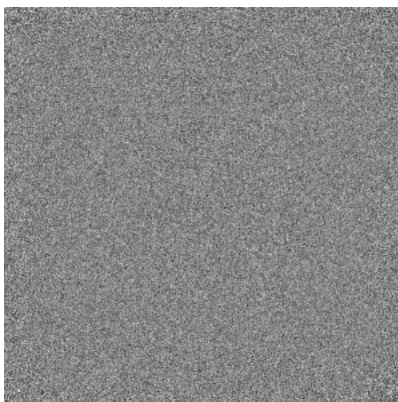


Z Index: 161

6.3.2 Raw map



X Index: 0



Y Index: 0

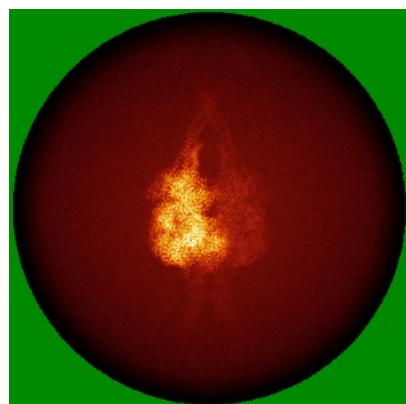


Z Index: 161

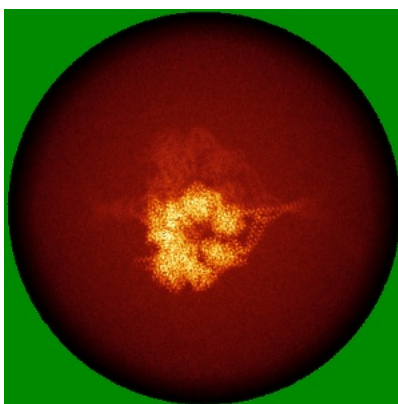
The images above show the largest variance slices of the map in three orthogonal directions.

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

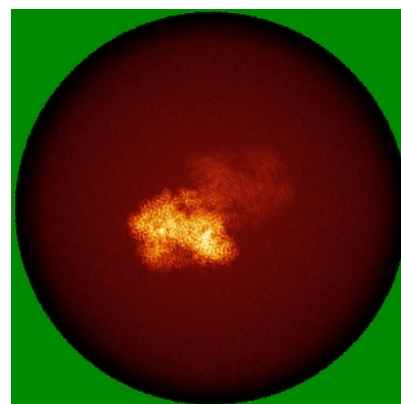
6.4.1 Primary map



X

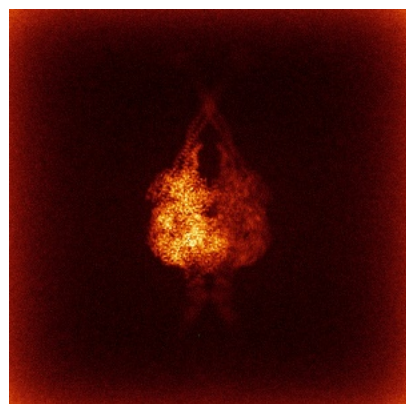


Y

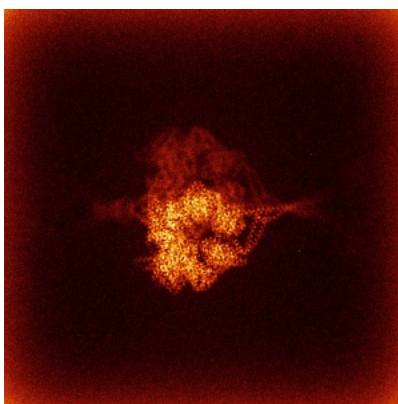


Z

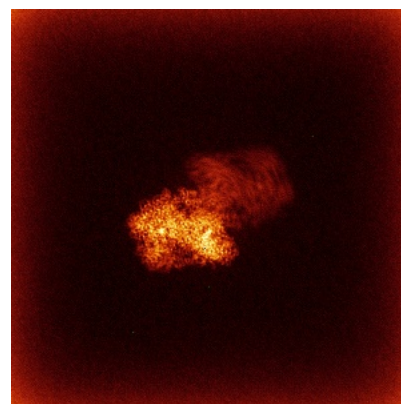
6.4.2 Raw map



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 0.35. 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.

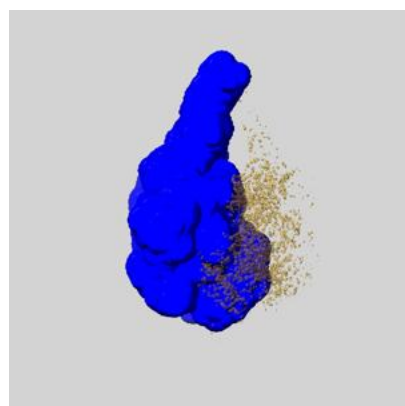
6.6 Mask visualisation [i](#)

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

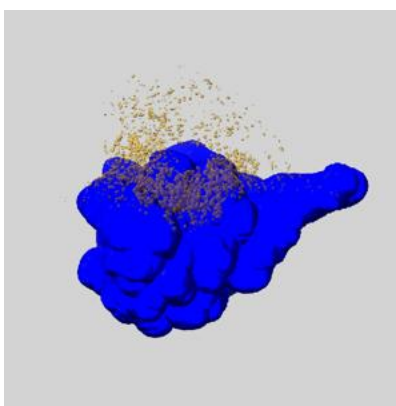
A mask typically either:

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

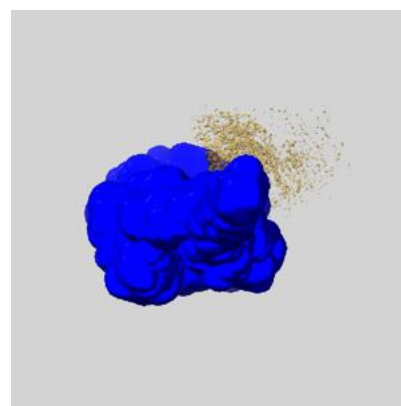
6.6.1 emd_44715_msk_1.map [i](#)



X



Y

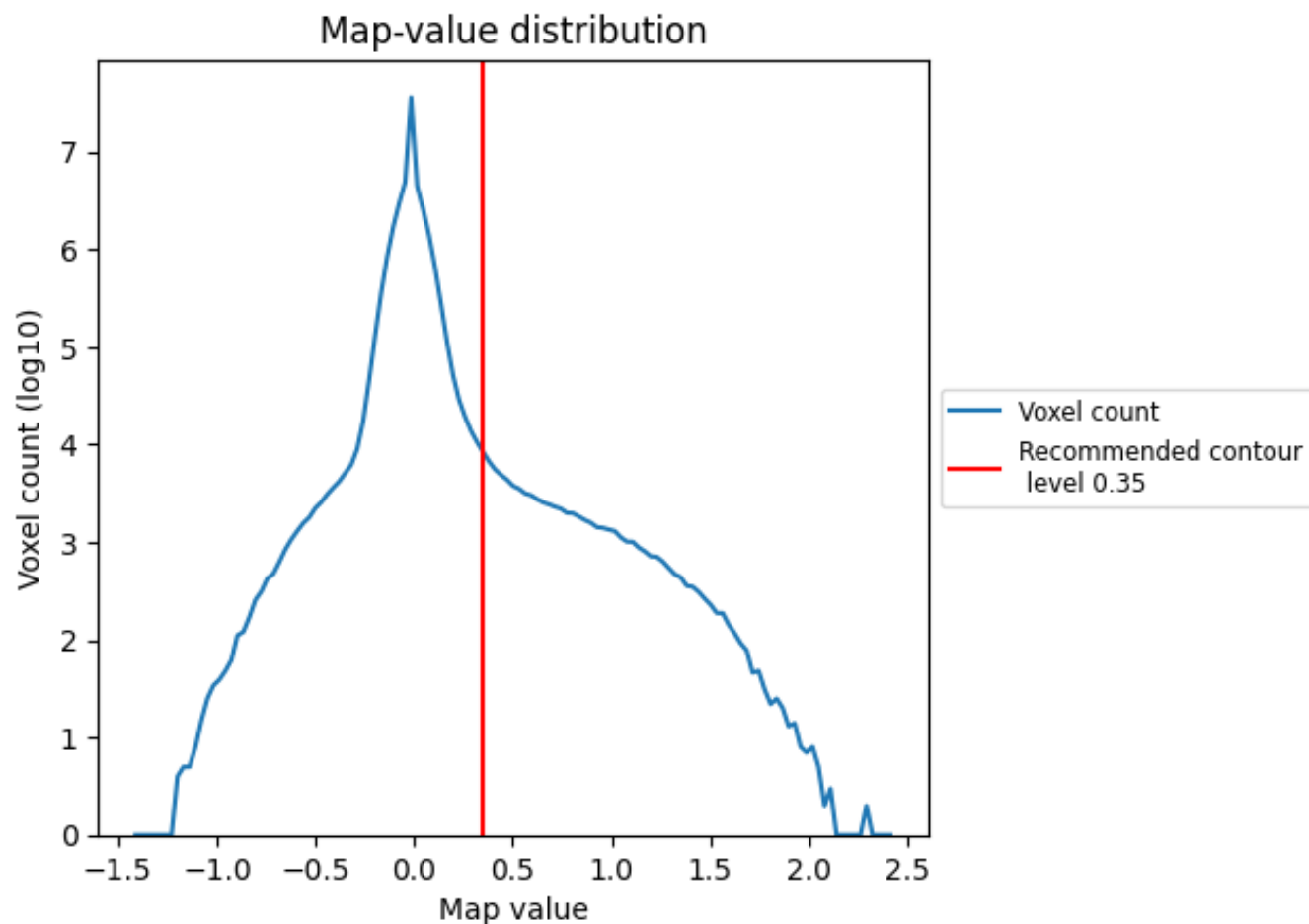


Z

7 Map analysis [i](#)

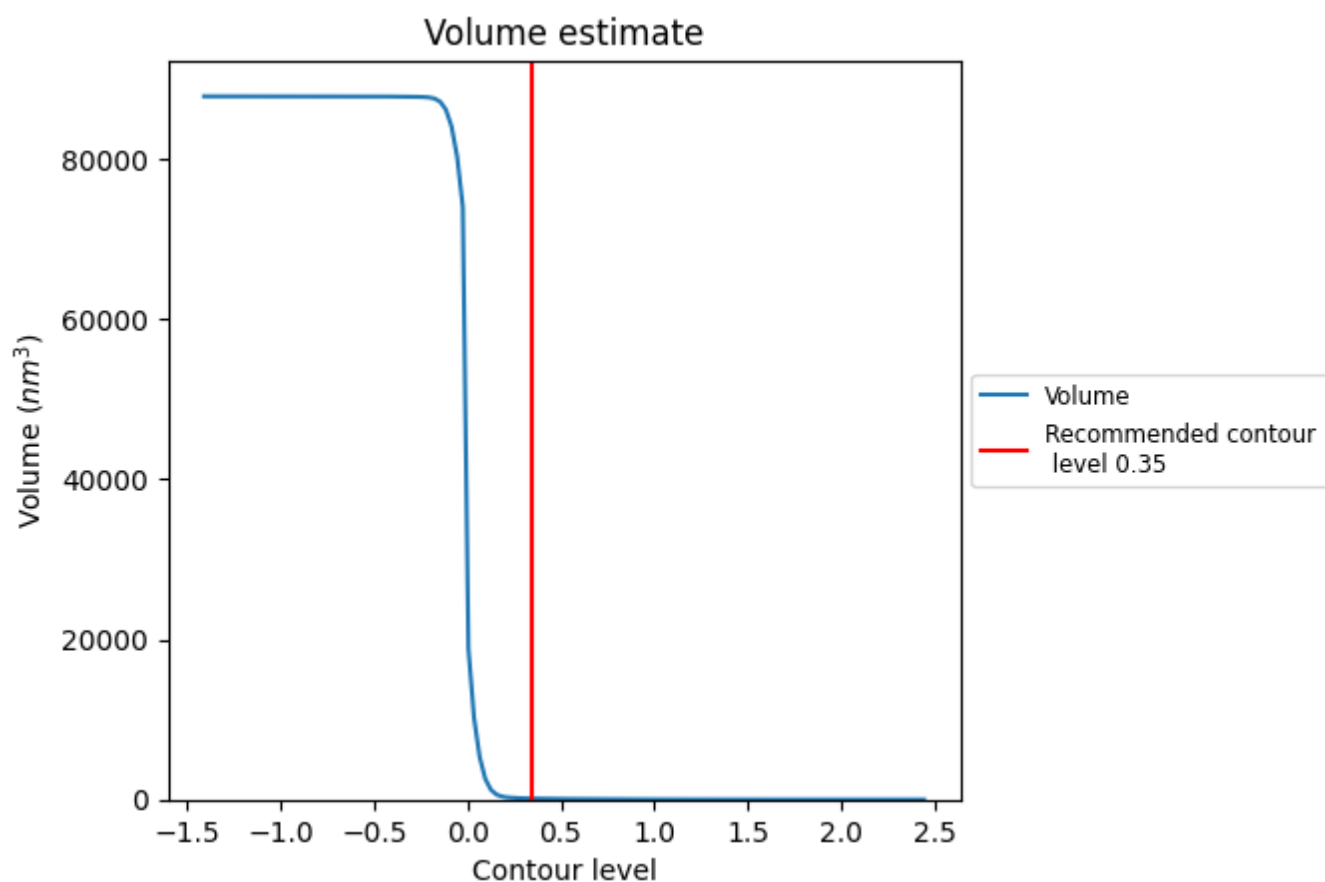
This section contains the results of statistical analysis of the map.

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.

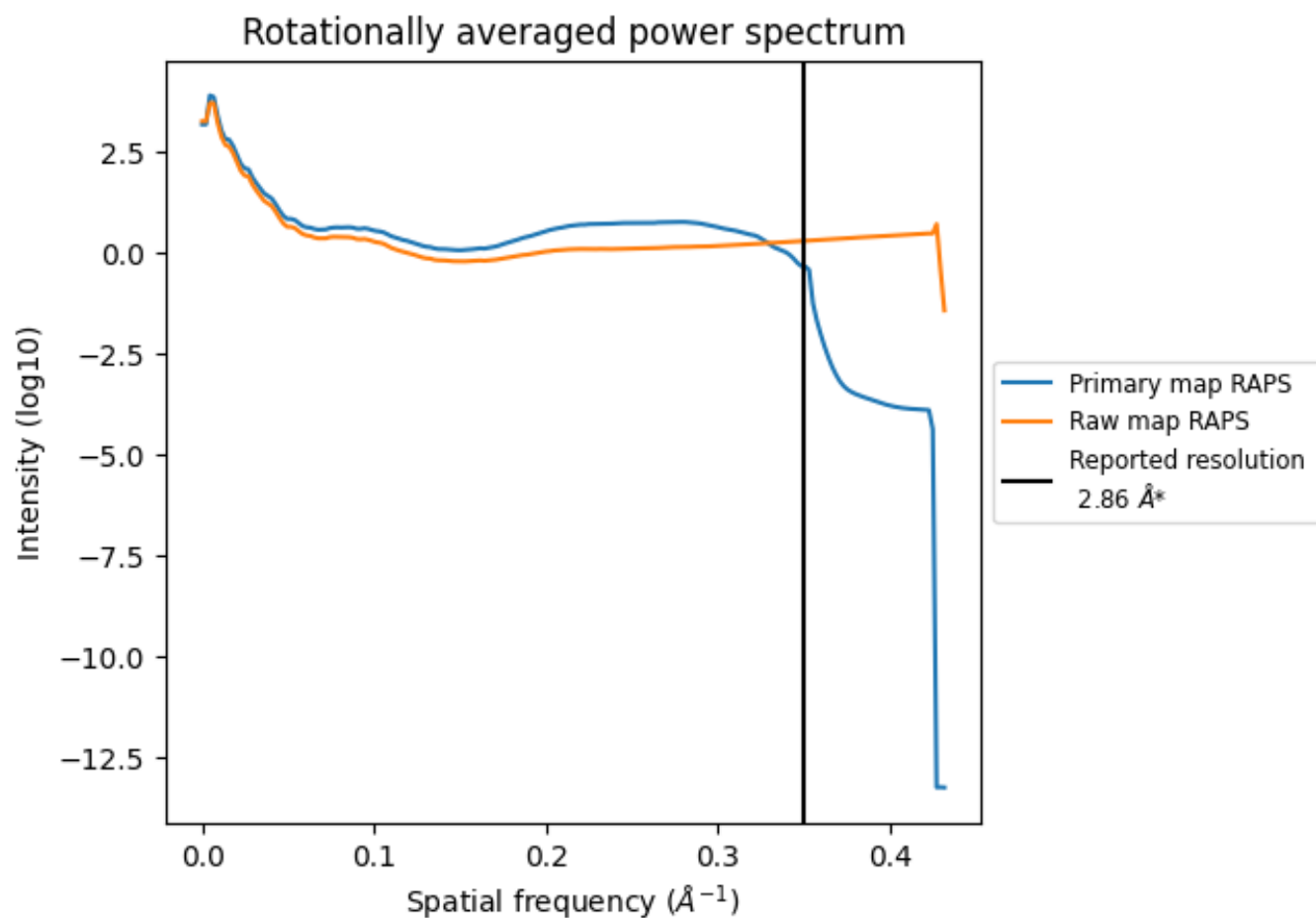
7.2 Volume estimate [i](#)



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 ⓘ

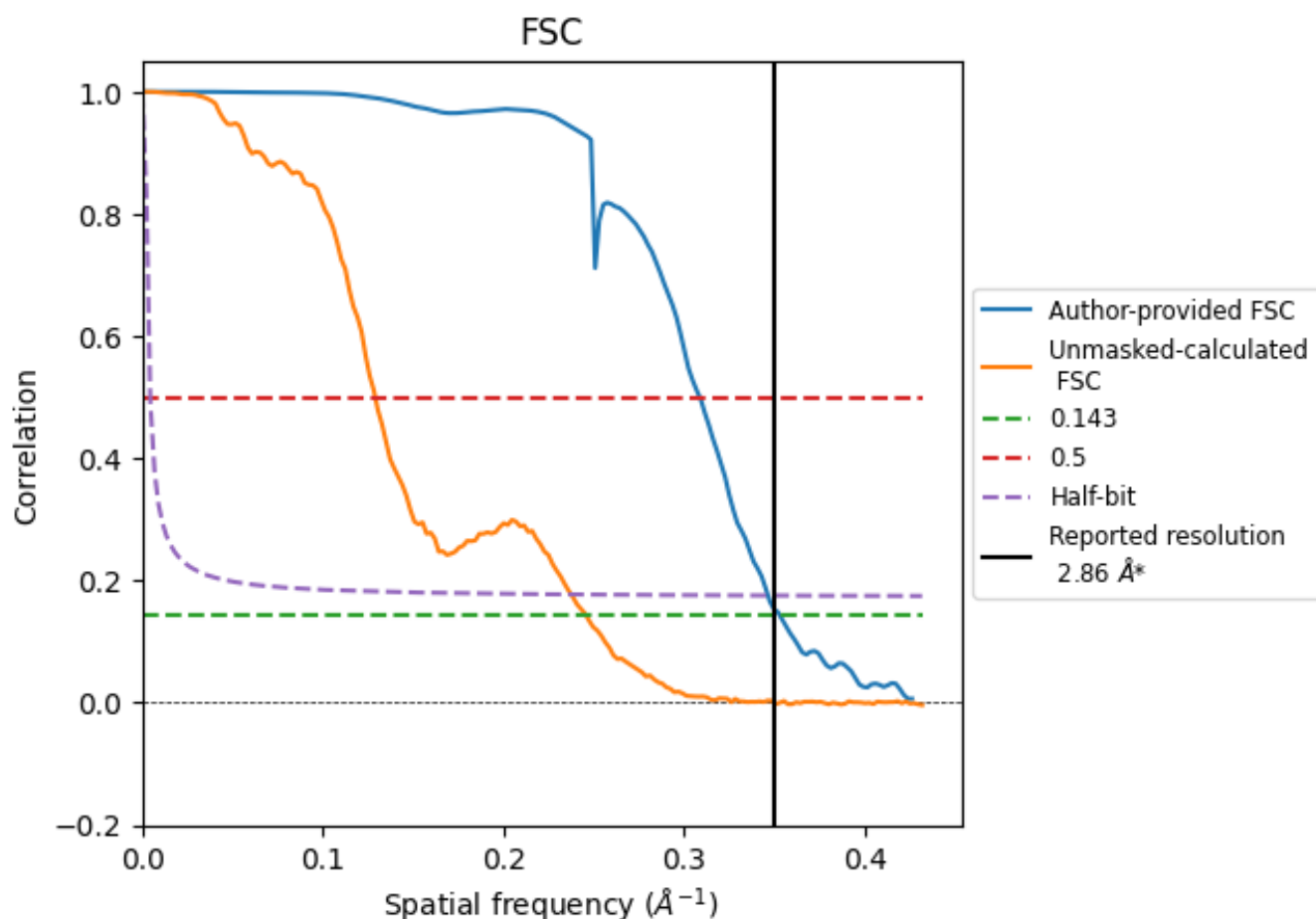


*Reported resolution corresponds to spatial frequency of 0.350 Å⁻¹

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 0.350 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

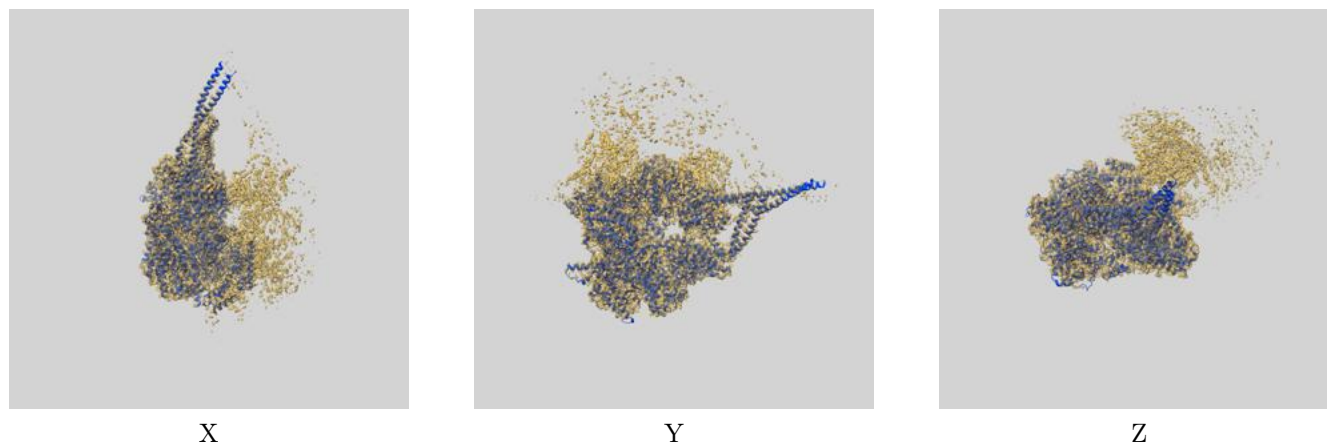
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.86	-	-
Author-provided FSC curve	2.83	3.24	2.89
Unmasked-calculated*	4.07	7.75	4.21

*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 4.07 differs from the reported value 2.86 by more than 10 %

9 Map-model fit [i](#)

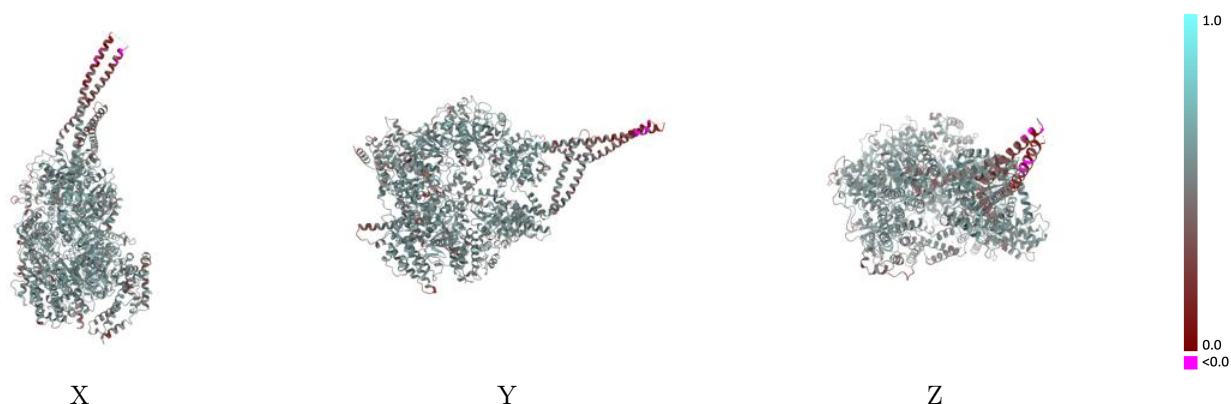
This section contains information regarding the fit between EMDB map EMD-44715 and PDB model 9BMY. Per-residue inclusion information can be found in [section 3](#) on [page 5](#).

9.1 Map-model overlay [i](#)



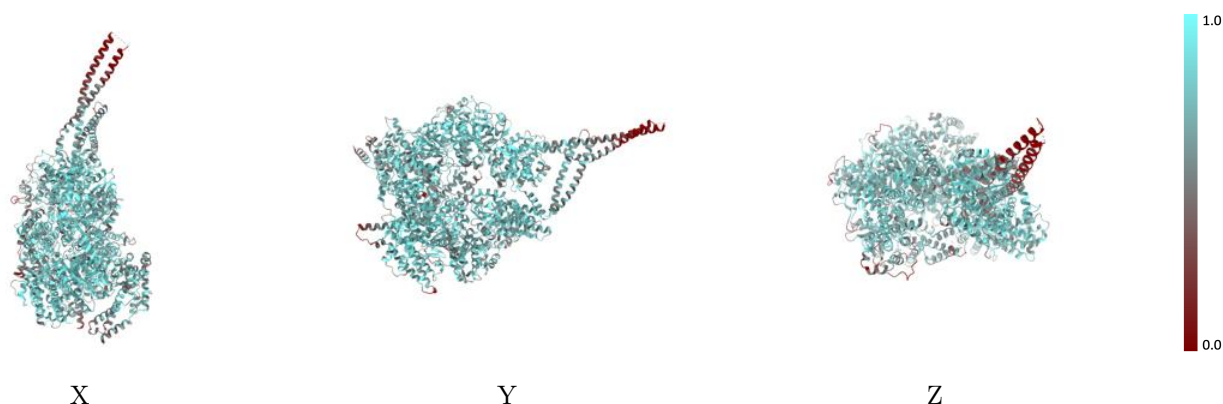
The images above show the 3D surface view of the map at the recommended contour level 0.35 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



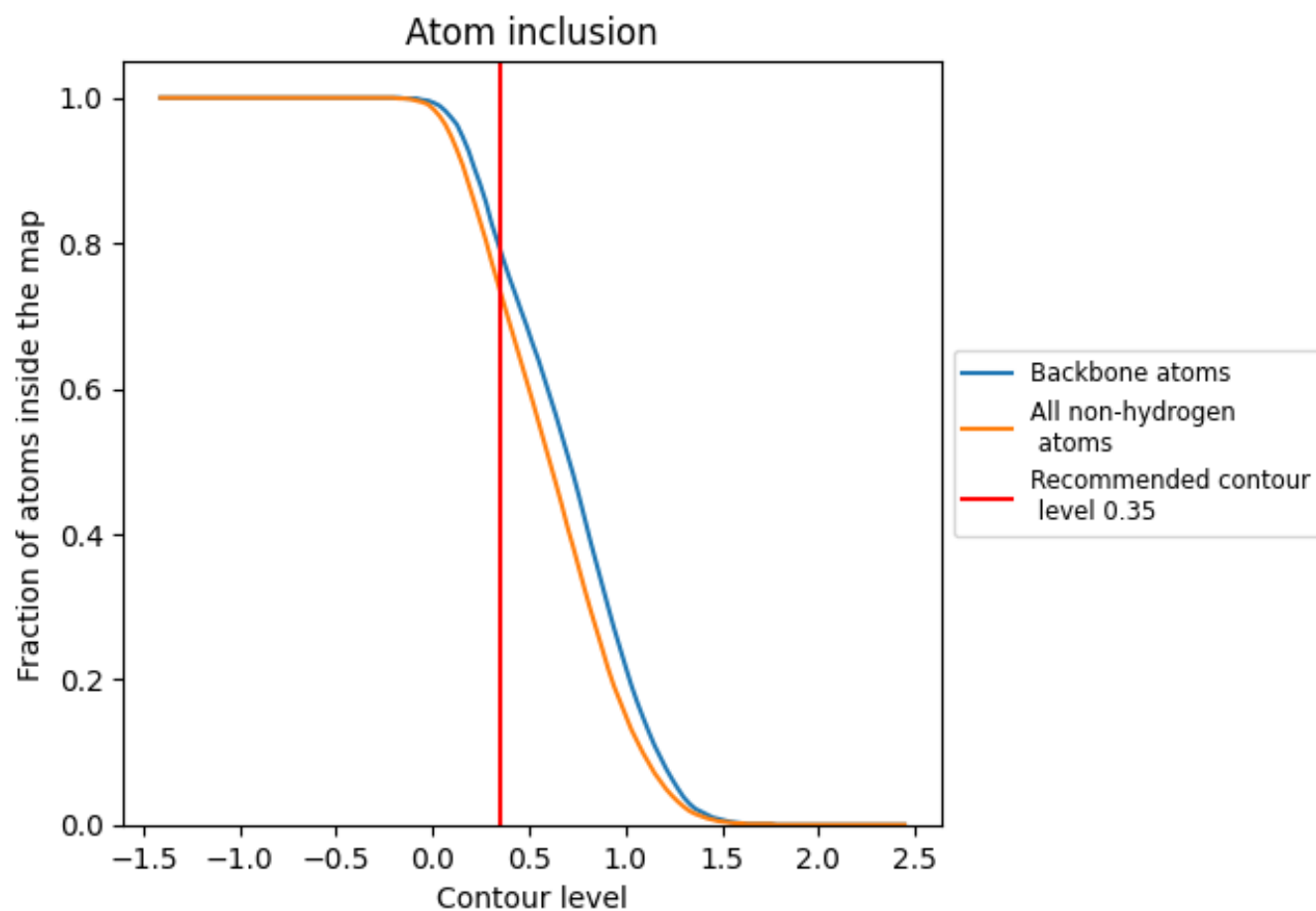
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.35).

9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 73% 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 (0.35) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7340	0.5330
A	0.7340	0.5330

