



Full wwPDB EM Validation Report ⓘ

Aug 16, 2025 – 01:25 PM EDT

PDB ID : 9BM0 / pdb_00009bm0
EMDB ID : EMD-44683
Title : State-2 of motor domain from full-length human dynein-1 in 5mM ATP
Authors : Chai, P.; Zhang, K.
Deposited on : 2024-05-02
Resolution : 2.80 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

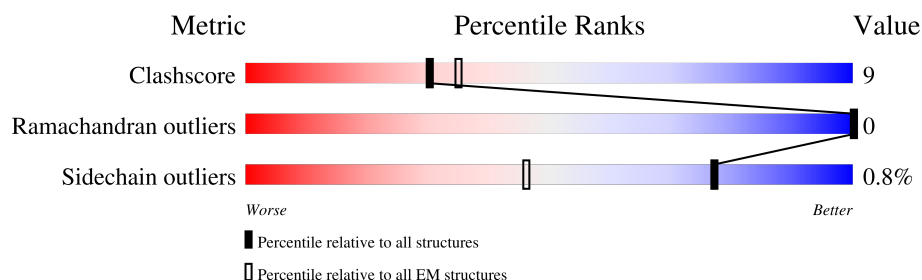
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 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](#)

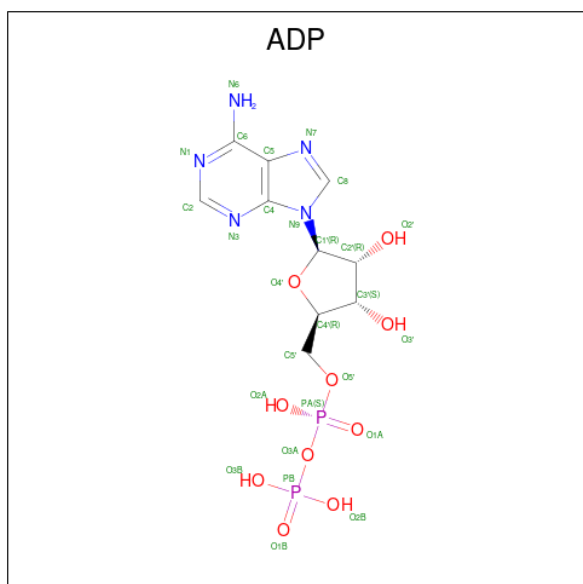
There are 5 unique types of molecules in this entry. The entry contains 23710 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

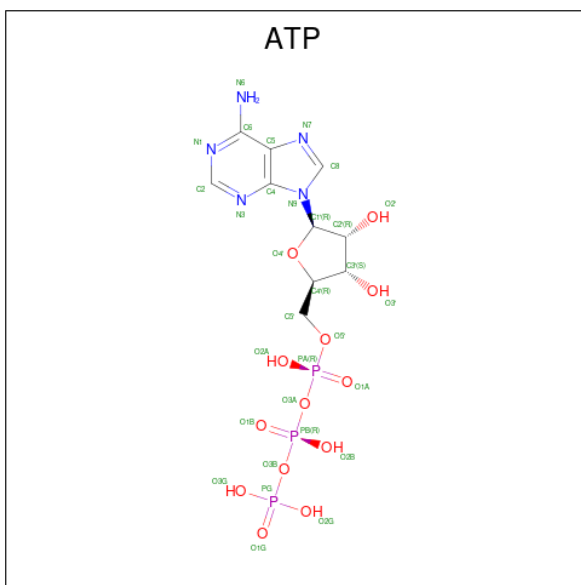
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2937	23593	15028	4070	4378	117	0	0

- 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).

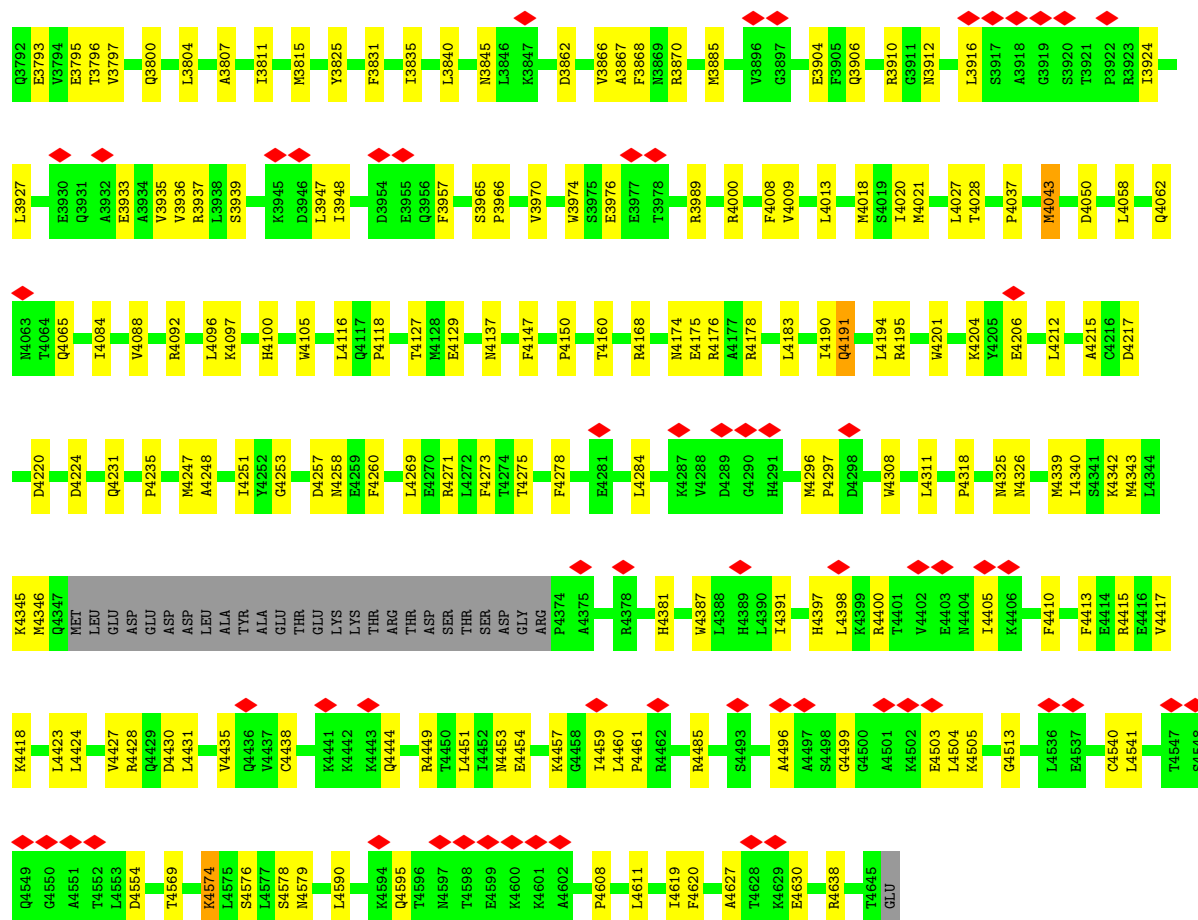
Mol	Chain	Residues	Atoms		AltConf
4	A	2	Total 2	Mg 2	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	AltConf
5	A	3	Total O 3 3	0



P3689	L3667	S3475	GLU	E3141	D2885	R2763	V2618	I2490	ALA
F3690	P3668	T3476	LEU	Q3038	E2888	P2760	R2621	Q2491	GLN
D3691	C3573	A3477	GLN	K3039	Y2892	R2763	F2622	L2494	ARG
S3694	T3574	L3478	LEU	M3043	R2896	R2763	S2623	I2498	ARG
R3695	I3578	L3479	GLU	L3044	L2905	M2773	F2635	L2499	LYS
F3698	ASP	K3480	ASP	D3045	D2906	E2774	Y2641	L2502	GLY
S3710	ALA	S3481	ALA	E3048	L2905	M2779	R2642	GLU	LYS
R3715	GLN	L3482	ASN	F3054	D2906	P2790	V2648	ASP	GLY
F3716	GLN	S3483	GLN	V3058	F2912	W2802	V2649	GLY	GLY
L3717	GLN	S3484	GLN	R3059	E2914	R2804	L2650	GLU	GLY
R3721	LYS	A3484	ALA	N3061	V2919	E2808	L2650	GLU	GLY
F3724	ALA	E3485	ALA	F3066	E2915	A2809	L2661	GLU	GLY
R3728	ALA	E3487	ALA	S3072	V2919	L2810	K2657	ALA	ALA
R3741	GLN	E3490	GLN	E3073	L2925	P2817	W2658	S2410	
L3742	GLN	K3491	GLN	K3076	Q2930	V2818	L2659	F2411	
E3746	GLN	E3494	GLN	L3091	L2933	E2819	V2660	R2412	
A3752	GLN	T3495	GLN	D3096	L2934	G2820	L2661	Q2416	
L3753	GLN	F3496	GLN	W3097	L2935	L2816	L2666	A2419	
N3754	GLN	K3497	GLN	S3098	L2935	P2811	L2668	A2420	
E3755	GLN	T3502	GLN	E3100	L2935	L2813	L2671	T2421	
F3756	GLN	L3503	GLN	G3106	L2946	L2816	Y2674	T2422	
R3757	GLN	S3510	GLN	T3110	L2946	P2817	Y2674	M2423	
G3758	GLN	Y3516	GLN	M3113	L2950	V2818	Y2674	K2551	
I3760	GLN	A3517	GLN	D3114	V2950	E2819	Y2674	V2552	
L3761	GLN	F3520	GLN	L3115	L2956	G2820	Q2677	D2573	
D3762	GLN	D3521	GLN	E3116	L2956	L2821	Q2677	L2433	
D3763	GLN	N3524	GLN	K3117	R2965	L2822	E2688	L2434	
D3764	GLN	R3525	GLN	Y3120	R2965	A2829	R2694	K2435	
T3765	GLN	F3529	GLN	D3124	E2988	Q2834	Q2698	H2445	
I3767	GLN	R3535	GLN	Y3125	K2989	W2845	E2704	L2449	
T3768	GLN	Q3537	GLN	M3126	E3006	T2846	R2705	L2450	
L3770	GLN	Q3542	GLN	P3127	E3007	E2847	R2706	R2451	
S3771	GLN	F3543	GLN	V3129	M3008	E2848	L2706	L2452	
N3772	GLN	D3546	GLN	Y3130	N3014	N2849	Q2707	R2453	
L3773	GLN	I3547	GLN	D3131	V3017	I2850	F2708	C2454	
K3774	GLN	T3550	GLN	K3132	L3020	D2851	K2721	A2465	
R3775	GLN	L3553	GLN	Q3135	G3023	L2855	R2729	C2466	
R3782	GLN	L3560	GLN	P3137	D3024	K2856	H2730	R2467	
E3786	GLN	Q3563	GLN	R3139	M3030	H2857	P2731	P2596	
D3788	GLN		GLN	R3140		L2860	P2732	F2606	
L3789	GLN		GLN			R2863	P2733	S2607	
V3790	GLN		GLN			E2864	V2734	A2608	
M3791	GLN		GLN			M2867	V2734	R2609	
			GLN			S2868	Y2738	R2611	
			ASN			R2869	A2742	L2612	
						W2876	Q2746	E2484	
							T2750	O2485	
								L2486	
								E2487	
								R2488	
								Y2489	



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	165772	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.729	Depositor
Minimum map value	-0.877	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.038	Depositor
Recommended contour level	0.2	Depositor
Map size (Å)	332.80002, 332.80002, 332.80002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	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, MG, ATP

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	0.32	0/24093	0.42	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	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2642	ARG	Sidechain
1	A	2753	ARG	Sidechain
1	A	3164	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	419	0
2	A	81	0	36	3	0
3	A	31	0	12	1	0
4	A	2	0	0	0	0
5	A	3	0	0	0	0
All	All	23710	0	23706	419	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 (419) 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:3476:THR:HG22	1:A:3480:LYS:NZ	1.60	1.15
1:A:3476:THR:HG22	1:A:3480:LYS:HZ1	1.28	0.94
1:A:1578:LEU:HA	1:A:1581:LYS:HE2	1.51	0.91
1:A:4235:PRO:HB2	1:A:4275:THR:HG23	1.56	0.88
1:A:3129:VAL:HG21	1:A:3149:PHE:HB2	1.55	0.87
1:A:3885:MET:HG2	1:A:4343:MET:HE1	1.55	0.86
1:A:3601:MET:HG3	1:A:3611:ARG:HH21	1.47	0.79
1:A:3215:VAL:HG21	1:A:3479:LEU:HD11	1.65	0.79
1:A:2816:LEU:HD12	1:A:2817:PRO:HD2	1.68	0.76
1:A:2094:LYS:NZ	2:A:4701:ADP:O2'	2.19	0.75
1:A:4296:MET:HE3	1:A:4297:PRO:HD2	1.69	0.75
1:A:2369:LEU:HD12	1:A:2373:MET:HE2	1.67	0.75
1:A:3476:THR:HG22	1:A:3480:LYS:HZ3	1.51	0.74
1:A:4339:MET:HE3	1:A:4343:MET:HE3	1.68	0.74
1:A:1508:LYS:HA	1:A:1513:TYR:CG	2.23	0.73
1:A:3790:VAL:O	1:A:3793:GLU:HG2	1.90	0.72
1:A:1530:ILE:HG13	1:A:1592:LEU:HD22	1.71	0.71
1:A:2671:MET:HG3	1:A:2721:LYS:HG2	1.73	0.70
1:A:2816:LEU:HD11	1:A:2820:GLY:HA3	1.74	0.69
1:A:4174:ASN:ND2	1:A:4231:GLN:O	2.25	0.69
1:A:4453:ASN:O	1:A:4457:LYS:HG2	1.91	0.69
1:A:1577:ALA:O	1:A:1580:LYS:HG2	1.93	0.68
1:A:4096:LEU:HD13	1:A:4105:TRP:HH2	1.59	0.68
1:A:4190:ILE:HD12	1:A:4201:TRP:HZ2	1.58	0.68
1:A:2885:ASP:HB3	1:A:2888:GLU:HG3	1.76	0.67
1:A:3114:ASP:O	1:A:3140:ARG:NH2	2.27	0.67
1:A:3588:LEU:HD11	1:A:3638:VAL:HG11	1.76	0.67
1:A:2933:LEU:HD13	1:A:2935:LEU:HD21	1.75	0.67
1:A:4326:ASN:ND2	1:A:4579:ASN:O	2.28	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1959:GLU:HB3	1:A:1962:ARG:HD3	1.76	0.66
1:A:3782:ARG:NH1	1:A:3786:GLU:OE1	2.27	0.66
1:A:4088:VAL:HG11	1:A:4116:LEU:HD21	1.77	0.66
1:A:1504:VAL:HA	1:A:1507:MET:HE3	1.79	0.65
1:A:1792:LEU:HD21	1:A:1811:LEU:HB3	1.79	0.64
1:A:3716:VAL:HG23	1:A:3840:LEU:HD21	1.79	0.64
1:A:3581:LYS:HD2	1:A:3582:ARG:HG3	1.79	0.64
1:A:4168:ARG:NH2	1:A:4217:ASP:OD1	2.29	0.64
1:A:3106:GLY:O	1:A:3110:THR:OG1	2.13	0.63
1:A:3100:GLU:OE1	1:A:3132:LYS:NZ	2.31	0.63
1:A:3906:GLN:OE1	1:A:3910:ARG:NH1	2.32	0.63
1:A:2149:LEU:HD11	1:A:2157:LEU:HD13	1.81	0.63
1:A:4541:LEU:HD11	1:A:4590:LEU:HB3	1.80	0.63
1:A:2635:PHE:HE1	1:A:2661:LEU:HD11	1.64	0.62
1:A:1539:ASP:OD1	1:A:1542:ARG:NH2	2.33	0.62
1:A:4540:CYS:HB3	1:A:4595:GLN:HG2	1.81	0.61
1:A:3714:ASN:OD1	1:A:3728:ARG:NH2	2.34	0.61
1:A:4269:LEU:HD23	1:A:4273:PHE:CE1	2.36	0.61
1:A:2317:SER:OG	1:A:2324:LEU:O	2.18	0.61
1:A:2181:GLU:HG3	1:A:2244:LEU:HB2	1.83	0.61
1:A:2174:GLU:OE1	1:A:2176:THR:OG1	2.19	0.60
1:A:2621:ASN:OD1	1:A:3014:ASN:ND2	2.34	0.60
1:A:2760:PRO:HA	1:A:2763:ARG:HG3	1.82	0.60
1:A:3974:TRP:NE1	1:A:3976:GLU:OE1	2.26	0.60
1:A:2635:PHE:CE1	1:A:2661:LEU:HD11	2.36	0.60
1:A:2242:GLU:HG3	1:A:2248:GLU:HA	1.82	0.60
1:A:1777:PRO:O	1:A:1780:SER:OG	2.20	0.60
1:A:2449:LEU:HA	1:A:2453:ARG:HH21	1.65	0.60
1:A:2790:PRO:HB3	1:A:3076:LYS:HG3	1.84	0.59
1:A:2231:SER:OG	3:A:4702:ATP:O1A	2.21	0.59
1:A:2548:TRP:CZ3	1:A:2551:LYS:HD2	2.38	0.59
1:A:2808:GLU:HG3	1:A:2811:ARG:HH21	1.68	0.59
1:A:3904:GLU:OE2	1:A:3904:GLU:N	2.33	0.59
1:A:3601:MET:HG3	1:A:3611:ARG:NH2	2.17	0.59
1:A:1504:VAL:HG12	1:A:1508:LYS:HE3	1.85	0.58
1:A:2433:VAL:HG22	1:A:2498:ILE:HD11	1.84	0.58
1:A:2607:SER:HA	1:A:2610:ARG:NE	2.17	0.58
1:A:1814:GLU:OE1	1:A:1818:GLN:NE2	2.37	0.58
1:A:2906:ASP:OD1	1:A:3655:ARG:NH1	2.32	0.58
1:A:3017:VAL:HB	1:A:3020:LEU:HB2	1.86	0.58
1:A:3916:LEU:HD12	1:A:3933:GLU:HG3	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1577:ALA:HA	1:A:1580:LYS:HE3	1.85	0.58
1:A:4505:LYS:NZ	1:A:4554:ASP:O	2.36	0.58
1:A:3655:ARG:HG2	1:A:3660:VAL:HG22	1.86	0.58
1:A:2221:MET:HG2	1:A:2343:PHE:HB2	1.86	0.57
1:A:2573:ASP:OD1	1:A:2576:ARG:NH2	2.37	0.57
1:A:3475:SER:O	1:A:3479:LEU:HG	2.04	0.57
1:A:2422:ILE:HD13	1:A:2487:GLU:HA	1.86	0.57
1:A:3128:VAL:HA	1:A:3145:ASN:HD21	1.70	0.57
1:A:3639:GLU:OE2	1:A:3639:GLU:N	2.22	0.57
1:A:1504:VAL:O	1:A:1507:MET:HG2	2.03	0.57
1:A:4020:ILE:HG23	1:A:4021:MET:HE2	1.86	0.57
1:A:2810:LEU:HD23	1:A:2813:LEU:HD12	1.85	0.57
1:A:2080:LEU:O	1:A:4415:ARG:NH1	2.38	0.56
1:A:2211:TYR:O	1:A:2214:THR:OG1	2.22	0.56
1:A:3650:ASN:HD21	1:A:3695:ARG:HH11	1.53	0.56
1:A:4611:LEU:HB2	1:A:4619:ILE:HD11	1.88	0.56
1:A:2220:LEU:HD13	1:A:2342:MET:HE2	1.87	0.56
1:A:1795:SER:O	1:A:1798:MET:HG2	2.06	0.56
1:A:2285:ARG:NH1	1:A:2331:GLU:OE2	2.30	0.56
1:A:1508:LYS:HG2	1:A:1513:TYR:CE1	2.41	0.56
1:A:4009:VAL:HG13	1:A:4013:LEU:HD12	1.88	0.56
1:A:1575:PHE:O	1:A:1579:MET:HG2	2.07	0.55
1:A:1793:ALA:O	1:A:1797:LEU:HG	2.06	0.55
1:A:2661:LEU:HD12	1:A:2708:PHE:CE2	2.41	0.55
1:A:3793:GLU:O	1:A:3796:THR:HG22	2.07	0.55
1:A:2087:ASP:H	1:A:2148:LYS:NZ	2.05	0.54
1:A:4027:LEU:HB3	1:A:4058:LEU:HD22	1.89	0.54
1:A:1968:LEU:HD13	1:A:2028:LEU:HD12	1.88	0.54
1:A:3791:MET:O	1:A:3795:GLU:HG2	2.07	0.54
1:A:4150:PRO:O	1:A:4195:ARG:NH2	2.41	0.54
1:A:4485:ARG:HG2	1:A:4513:GLY:HA2	1.89	0.54
1:A:4318:PRO:HG2	1:A:4325:ASN:HA	1.90	0.54
1:A:3521:ASP:OD2	1:A:3521:ASP:N	2.37	0.54
1:A:3970:VAL:HB	1:A:3989:ARG:HD3	1.90	0.54
1:A:2536:ASP:OD2	1:A:2576:ARG:NH1	2.41	0.53
1:A:2538:GLU:HB3	1:A:2548:TRP:CE2	2.43	0.53
1:A:3927:LEU:HD11	1:A:3957:PHE:HE2	1.72	0.53
1:A:4569:THR:HG23	1:A:4578:SER:HB2	1.90	0.53
1:A:1949:CYS:HA	1:A:2012:MET:HG3	1.89	0.53
1:A:1491:ASP:OD1	1:A:1492:ASP:N	2.41	0.53
1:A:2485:GLN:HA	1:A:2488:ARG:HH21	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2742:ALA:O	1:A:2746:GLN:HG2	2.09	0.53
1:A:1937:ASP:HA	1:A:1967:MET:HG3	1.91	0.53
1:A:3120:TYR:OH	1:A:3126:MET:HE1	2.09	0.53
1:A:4424:LEU:HD11	1:A:4428:ARG:HD2	1.90	0.53
1:A:3474:ARG:O	1:A:3478:LEU:HG	2.08	0.53
1:A:4037:PRO:HB2	1:A:4118:PRO:HG2	1.91	0.53
1:A:4444:GLN:HG2	1:A:4449:ARG:HG3	1.91	0.53
1:A:4258:ASN:OD1	1:A:4260:PHE:N	2.41	0.53
1:A:1459:LEU:HD23	1:A:1507:MET:HB2	1.90	0.52
1:A:4097:LYS:HA	1:A:4127:THR:OG1	2.08	0.52
1:A:1500:HIS:O	1:A:1504:VAL:HG23	2.10	0.52
1:A:2412:MET:HG3	1:A:2416:GLN:OE1	2.10	0.52
1:A:3486:ARG:NH1	1:A:3487:GLU:OE2	2.43	0.52
1:A:2138:ILE:HD12	1:A:2161:LEU:HD22	1.92	0.52
1:A:4178:ARG:HH21	1:A:4296:MET:HG3	1.75	0.52
1:A:1853:VAL:HA	1:A:1856:GLN:HG3	1.90	0.52
1:A:2356:VAL:HG13	1:A:2361:MET:HE3	1.91	0.52
1:A:4496:ALA:HB2	1:A:4504:LEU:HD21	1.92	0.52
1:A:3583:PHE:CE2	1:A:3587:PRO:HD3	2.46	0.51
1:A:4431:LEU:O	1:A:4435:VAL:HG23	2.10	0.51
1:A:3110:THR:HG22	1:A:3113:MET:SD	2.50	0.51
1:A:1976:GLN:HB2	1:A:2035:LEU:HD21	1.91	0.51
1:A:3207:LYS:NZ	1:A:3756:VAL:O	2.42	0.51
1:A:4183:LEU:HD11	1:A:4247:MET:HE1	1.91	0.51
1:A:3172:THR:HG21	1:A:3694:SER:HB3	1.92	0.51
1:A:2618:VAL:HG23	1:A:2659:LEU:HD11	1.93	0.50
1:A:2811:ARG:HB3	1:A:2812:PRO:HD3	1.93	0.50
1:A:2802:TRP:CZ2	1:A:2829:ALA:HB2	2.46	0.50
1:A:4176:ARG:NH2	1:A:4224:ASP:OD1	2.36	0.50
1:A:2326:THR:HG22	1:A:2332:ARG:HG2	1.94	0.50
1:A:2660:VAL:HG22	1:A:2707:GLN:NE2	2.26	0.50
1:A:2982:ARG:NH2	1:A:2988:GLU:OE2	2.34	0.50
1:A:2060:ARG:HG3	1:A:2060:ARG:HH11	1.77	0.50
1:A:2834:GLN:HE22	1:A:2847:ASP:CG	2.19	0.50
1:A:2775:GLU:O	1:A:2779:MET:HG3	2.11	0.50
1:A:3639:GLU:HB3	1:A:3686:VAL:HG21	1.92	0.50
1:A:1661:VAL:HG13	1:A:1676:ILE:HB	1.93	0.50
1:A:3203:VAL:HG11	1:A:3754:ASN:HA	1.93	0.50
1:A:2946:LEU:O	1:A:2950:VAL:HG23	2.11	0.50
1:A:3135:GLN:O	1:A:3137:PRO:HD3	2.12	0.50
1:A:3935:VAL:HG13	1:A:3947:LEU:HD23	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1577:ALA:O	1:A:1581:LYS:HG3	2.12	0.50
1:A:3161:LEU:HD23	1:A:3168:THR:HG22	1.94	0.50
1:A:2914:GLU:OE1	1:A:3098:SER:OG	2.29	0.49
1:A:3459:GLN:HA	1:A:3462:LYS:HD2	1.93	0.49
1:A:3965:SER:O	1:A:3965:SER:OG	2.27	0.49
1:A:2863:ARG:HG2	1:A:2863:ARG:HH11	1.77	0.49
1:A:2213:ILE:HG22	1:A:2220:LEU:HD23	1.94	0.49
1:A:3885:MET:HG2	1:A:4343:MET:CE	2.36	0.49
1:A:1984:GLU:HG3	1:A:1997:ILE:HD12	1.95	0.49
1:A:3194:LEU:HD23	1:A:3500:MET:HE2	1.94	0.49
1:A:1967:MET:O	1:A:1971:VAL:HG22	2.12	0.49
1:A:2047:GLN:HA	1:A:2070:VAL:HG21	1.94	0.49
1:A:3030:MET:HE2	1:A:3030:MET:HA	1.93	0.49
1:A:3659:ARG:HE	1:A:3661:LEU:HD21	1.78	0.49
1:A:4183:LEU:HD11	1:A:4247:MET:CE	2.42	0.49
1:A:2509:LYS:HE2	1:A:2509:LYS:HB3	1.57	0.49
1:A:3691:ASP:OD2	1:A:3691:ASP:N	2.46	0.49
1:A:3517:ALA:HB1	1:A:3525:ARG:HG2	1.94	0.49
1:A:4247:MET:HG3	1:A:4251:ILE:HD12	1.94	0.49
1:A:2905:LEU:HD11	1:A:3652:GLU:HB3	1.94	0.48
1:A:3807:ALA:O	1:A:3811:ILE:HG13	2.13	0.48
1:A:2915:VAL:O	1:A:2919:VAL:HG13	2.13	0.48
1:A:2387:LEU:O	1:A:2467:ARG:NH2	2.46	0.48
1:A:2590:PRO:HB2	1:A:2731:VAL:HG12	1.94	0.48
1:A:2980:LEU:HB3	1:A:3054:PHE:HZ	1.76	0.48
1:A:1844:PHE:CD2	1:A:1859:ILE:HD12	2.49	0.48
1:A:2688:GLU:HB2	1:A:2730:HIS:CE1	2.48	0.48
1:A:2956:LEU:HD22	1:A:2989:LYS:HB3	1.94	0.48
1:A:3710:SER:O	1:A:3714:ASN:ND2	2.42	0.48
1:A:2485:GLN:HA	1:A:2488:ARG:HE	1.79	0.48
1:A:3563:GLN:NE2	1:A:3567:LEU:O	2.47	0.48
1:A:2486:LEU:O	1:A:2490:ILE:HG12	2.13	0.48
1:A:2980:LEU:HD12	1:A:3058:VAL:HG21	1.96	0.48
1:A:2930:GLN:HB2	1:A:3059:ILE:HG23	1.95	0.48
1:A:4176:ARG:NH1	1:A:4220:ASP:OD1	2.46	0.48
1:A:3510:SER:HB3	1:A:3553:LEU:HD21	1.96	0.48
1:A:3154:LEU:HG	1:A:3516:TYR:CD1	2.48	0.48
1:A:4430:ASP:HB3	1:A:4451:LEU:HD21	1.95	0.48
1:A:1692:ILE:HG23	1:A:1701:TRP:CD1	2.49	0.47
1:A:2063:GLU:O	1:A:2067:ASN:ND2	2.45	0.47
1:A:2290:SER:HB2	1:A:2295:LEU:HG	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3721:ARG:HE	1:A:3724:VAL:HG21	1.79	0.47
1:A:4576:SER:HA	1:A:4630:GLU:OE2	2.14	0.47
1:A:2224:GLY:O	1:A:2346:GLN:HA	2.13	0.47
1:A:2498:ILE:HG23	1:A:2502:LEU:HD22	1.96	0.47
1:A:3835:ILE:HG23	1:A:3866:VAL:HG12	1.95	0.47
1:A:2491:GLN:HB3	1:A:2524:VAL:HG13	1.94	0.47
1:A:2970:GLU:H	1:A:2970:GLU:CD	2.21	0.47
1:A:3609:ILE:HA	1:A:3632:PRO:HG2	1.96	0.47
1:A:2912:PHE:CE1	1:A:2914:GLU:HB2	2.50	0.47
1:A:1721:VAL:HA	1:A:1724:VAL:HG12	1.97	0.47
1:A:4065:GLN:HB3	1:A:4092:ARG:CZ	2.44	0.47
1:A:4160:THR:HG23	1:A:4212:LEU:HD21	1.96	0.47
1:A:4183:LEU:HD12	1:A:4183:LEU:HA	1.69	0.47
1:A:4400:ARG:HD2	1:A:4405:ILE:HD11	1.96	0.47
1:A:1493:LEU:HD21	1:A:1534:PHE:CD2	2.49	0.47
1:A:2925:ILE:HG13	1:A:2933:LEU:HD21	1.96	0.47
1:A:4387:TRP:O	1:A:4391:ILE:HG13	2.15	0.47
1:A:1654:PHE:HE1	1:A:1702:LEU:HD21	1.79	0.47
1:A:2222:MET:HE1	1:A:2342:MET:HB3	1.96	0.47
1:A:2609:LEU:HA	1:A:2612:LEU:HD12	1.97	0.47
1:A:3043:MET:HE2	1:A:3043:MET:HB3	1.84	0.47
1:A:3811:ILE:O	1:A:3815:MET:HG3	2.15	0.47
1:A:4457:LYS:HB2	1:A:4459:ILE:HG13	1.97	0.47
1:A:1876:GLN:HE21	1:A:1921:HIS:CD2	2.32	0.46
1:A:2152:GLU:CD	1:A:2152:GLU:H	2.22	0.46
1:A:3191:ARG:O	1:A:3195:GLU:HG2	2.15	0.46
1:A:1805:ARG:O	1:A:1809:GLU:HG3	2.15	0.46
1:A:2419:ALA:O	1:A:2423:MET:HG3	2.15	0.46
1:A:2230:LYS:HG2	1:A:2364:PHE:CD1	2.51	0.46
1:A:2412:MET:HE1	1:A:2467:ARG:HA	1.97	0.46
1:A:3471:LYS:HG3	1:A:3474:ARG:HH21	1.80	0.46
1:A:2581:LEU:HD21	1:A:2593:LEU:HD21	1.97	0.46
1:A:2454:CYS:SG	1:A:2502:LEU:HA	2.56	0.46
1:A:2876:TRP:HB3	1:A:2892:TYR:CE2	2.50	0.46
1:A:1896:LEU:HD21	1:A:2015:PHE:CZ	2.51	0.46
1:A:2087:ASP:O	1:A:2148:LYS:NZ	2.48	0.46
1:A:3641:TYR:OH	1:A:3646:ASN:OD1	2.22	0.46
1:A:4260:PHE:CE2	1:A:4608:PRO:HB3	2.51	0.46
1:A:2590:PRO:O	1:A:2732:PRO:HD2	2.16	0.46
1:A:4339:MET:O	1:A:4343:MET:HG3	2.16	0.46
1:A:1671:SER:HB2	1:A:1693:THR:HG23	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3178:ASP:OD1	1:A:3584:ASN:HB2	2.16	0.46
1:A:4296:MET:CE	1:A:4297:PRO:HD2	2.44	0.46
1:A:3588:LEU:HD23	1:A:3698:PHE:CE1	2.51	0.46
1:A:2033:LYS:NZ	1:A:4206:GLU:OE2	2.48	0.45
1:A:2592:VAL:HB	1:A:2733:VAL:HG22	1.97	0.45
1:A:1674:LEU:HB3	1:A:1685:MET:HE1	1.98	0.45
1:A:2060:ARG:HG3	1:A:2060:ARG:NH1	2.32	0.45
1:A:3642:ASP:OD1	1:A:3644:VAL:HG22	2.15	0.45
1:A:1876:GLN:NE2	1:A:1921:HIS:NE2	2.63	0.45
1:A:2040:ALA:HB1	1:A:4257:ASP:HB3	1.96	0.45
1:A:3138:SER:OG	1:A:3141:GLU:HG3	2.17	0.45
1:A:1899:ARG:N	1:A:1899:ARG:HD2	2.30	0.45
1:A:4271:ARG:NH2	1:A:4284:LEU:O	2.42	0.45
1:A:1567:ARG:O	1:A:1571:ILE:HG22	2.17	0.45
1:A:1930:PHE:HA	1:A:2326:THR:HG21	1.99	0.45
1:A:2047:GLN:NE2	1:A:2067:ASN:OD1	2.44	0.45
1:A:3127:PRO:HB2	1:A:3535:HIS:CD2	2.51	0.45
1:A:3574:THR:O	1:A:3578:ILE:HG13	2.17	0.45
1:A:4297:PRO:HG3	1:A:4308:TRP:CG	2.51	0.45
1:A:2074:LYS:O	1:A:2078:GLU:HG3	2.16	0.45
1:A:2975:ASP:O	1:A:2979:VAL:HG23	2.16	0.45
1:A:1477:LEU:HB3	1:A:1485:ARG:HB3	1.98	0.45
1:A:3060:ARG:NH2	1:A:3061:ASN:HD21	2.14	0.45
1:A:1895:ALA:HB2	1:A:2037:ARG:HB2	1.98	0.45
1:A:3520:PHE:HB3	1:A:3524:MET:HB3	1.98	0.45
1:A:4391:ILE:HB	1:A:4428:ARG:NH1	2.32	0.45
1:A:2809:ALA:O	1:A:2813:LEU:HG	2.17	0.45
1:A:3096:ASP:OD1	1:A:3097:TRP:N	2.50	0.45
1:A:3160:ARG:HG2	1:A:3164:ARG:HH21	1.82	0.45
1:A:1541:GLN:O	1:A:1545:VAL:HG23	2.17	0.44
1:A:2548:TRP:CD1	1:A:2576:ARG:HG2	2.52	0.44
1:A:2845:TRP:O	1:A:2849:ASN:ND2	2.49	0.44
1:A:2231:SER:O	1:A:2235:ARG:HG3	2.17	0.44
1:A:3163:LYS:HE2	1:A:3163:LYS:HB3	1.87	0.44
1:A:2068:LYS:NZ	1:A:2164:VAL:O	2.42	0.44
1:A:2070:VAL:HB	1:A:2071:PRO:HD3	2.00	0.44
1:A:3214:GLN:HG3	1:A:3759:ARG:HD2	2.00	0.44
1:A:4423:LEU:HD12	1:A:4427:VAL:HG23	1.99	0.44
1:A:4454:GLU:OE1	1:A:4461:PRO:HA	2.16	0.44
1:A:3966:PRO:HD2	1:A:4000:ARG:HG3	1.99	0.44
1:A:4178:ARG:NH2	1:A:4297:PRO:O	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1746:GLN:O	1:A:1750:VAL:HG13	2.18	0.44
1:A:2612:LEU:HD13	1:A:2615:MET:SD	2.58	0.44
1:A:3114:ASP:O	1:A:3116:GLU:HG2	2.18	0.44
1:A:1914:GLU:HG3	2:A:4701:ADP:H2'	2.00	0.44
1:A:2030:ASP:HB2	1:A:4050:ASP:HB2	1.99	0.44
1:A:2465:ALA:HB1	1:A:2489:TYR:HE2	1.83	0.44
1:A:2494:LEU:O	1:A:2498:ILE:HG13	2.18	0.44
1:A:4342:LYS:O	1:A:4346:MET:HG3	2.18	0.44
1:A:1504:VAL:HG11	1:A:1524:GLU:HB3	1.98	0.44
1:A:1623:ARG:NH2	1:A:1634:ASP:OD1	2.51	0.44
1:A:4619:ILE:HG22	1:A:4620:PHE:HD1	1.83	0.44
1:A:2484:GLU:HG3	1:A:2485:GLN:N	2.33	0.44
1:A:2855:LEU:HD21	1:A:2863:ARG:HG3	2.00	0.44
1:A:1619:LEU:HD11	1:A:1638:LEU:HG	1.99	0.43
1:A:3008:MET:HG3	1:A:3066:PHE:HZ	1.83	0.43
1:A:3039:LYS:HB3	1:A:3039:LYS:HE3	1.75	0.43
1:A:3126:MET:SD	1:A:3127:PRO:HD2	2.58	0.43
1:A:2145:MET:O	1:A:2148:LYS:HG2	2.18	0.43
1:A:2471:GLN:HG2	1:A:2475:ASN:ND2	2.33	0.43
1:A:2586:ALA:C	1:A:2588:HIS:H	2.25	0.43
1:A:2648:VAL:HG21	1:A:2694:ARG:NH2	2.33	0.43
1:A:2660:VAL:HG22	1:A:2707:GLN:HE21	1.82	0.43
1:A:4460:LEU:HD12	1:A:4461:PRO:HD2	2.00	0.43
1:A:1587:LEU:HB3	1:A:1590:ASP:HB2	1.99	0.43
1:A:2099:SER:HB2	1:A:2140:SER:OG	2.18	0.43
1:A:2818:VAL:O	1:A:2822:ILE:HG12	2.17	0.43
1:A:3187:PHE:O	1:A:3191:ARG:HB2	2.18	0.43
1:A:3845:ASN:ND2	1:A:3862:ASP:OD2	2.44	0.43
1:A:3936:VAL:O	1:A:3939:SER:OG	2.29	0.43
1:A:4297:PRO:HG3	1:A:4308:TRP:CD2	2.53	0.43
1:A:4574:LYS:HG2	1:A:4627:ALA:HB2	2.01	0.43
1:A:1892:MET:O	1:A:1896:LEU:HG	2.18	0.43
1:A:3924:ILE:HG12	1:A:3948:ILE:HG23	1.99	0.43
1:A:2452:LEU:HD23	1:A:2452:LEU:HA	1.79	0.43
1:A:4204:LYS:HD3	1:A:4204:LYS:HA	1.93	0.43
1:A:1709:MET:HE3	1:A:1871:GLU:HA	2.01	0.43
1:A:2060:ARG:HH12	1:A:2129:GLU:HG3	1.83	0.43
1:A:3724:VAL:HG11	1:A:3797:VAL:HG11	2.00	0.43
1:A:4191:GLN:O	1:A:4194:LEU:HB2	2.19	0.43
1:A:2896:ARG:HD2	1:A:2896:ARG:HA	1.86	0.43
1:A:3132:LYS:HE3	1:A:3132:LYS:HB2	1.81	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4178:ARG:HD3	1:A:4278:PHE:CD2	2.54	0.43
1:A:2452:LEU:HD13	1:A:2729:ARG:HE	1.84	0.43
1:A:2851:ASP:OD1	1:A:2867:MET:HG2	2.18	0.43
1:A:4248:ALA:O	1:A:4253:GLY:HA3	2.19	0.42
1:A:1507:MET:O	1:A:1513:TYR:HB2	2.18	0.42
1:A:1524:GLU:HA	1:A:1527:LEU:HD12	2.01	0.42
1:A:2507:ARG:HH22	1:A:2509:LYS:NZ	2.18	0.42
1:A:3024:ASP:N	1:A:3024:ASP:OD1	2.51	0.42
1:A:4175:GLU:OE1	1:A:4175:GLU:N	2.52	0.42
1:A:4215:ALA:HB1	1:A:4247:MET:HE2	2.02	0.42
1:A:2445:HIS:NE2	1:A:2449:LEU:HD22	2.34	0.42
1:A:2548:TRP:HZ3	1:A:2551:LYS:HD2	1.82	0.42
1:A:2431:GLY:C	1:A:2435:LYS:HZ3	2.28	0.42
1:A:3642:ASP:HA	1:A:3643:PRO:HD3	1.86	0.42
1:A:2366:GLU:HG3	1:A:2451:ARG:NH2	2.33	0.42
1:A:2616:GLU:OE2	1:A:2657:LYS:HD2	2.19	0.42
1:A:3716:VAL:HG21	1:A:3804:LEU:HD23	2.02	0.42
1:A:1899:ARG:HG2	1:A:1983:ARG:HA	2.00	0.42
1:A:2060:ARG:HH12	1:A:2129:GLU:HA	1.84	0.42
1:A:2308:ASP:HB2	1:A:2674:TYR:CG	2.55	0.42
1:A:2606:PHE:O	1:A:2610:ARG:HG3	2.20	0.42
1:A:3601:MET:O	1:A:3605:LYS:HE3	2.19	0.42
1:A:3742:LEU:HD23	1:A:3742:LEU:HA	1.91	0.42
1:A:4499:GLY:HA3	1:A:4503:GLU:HG3	2.02	0.42
1:A:2970:GLU:CD	1:A:2970:GLU:N	2.77	0.42
1:A:3546:ASP:OD1	1:A:3546:ASP:N	2.53	0.42
1:A:3689:PRO:HB2	1:A:3691:ASP:OD2	2.19	0.42
1:A:4043:MET:HE2	1:A:4147:PHE:HE1	1.85	0.42
1:A:2346:GLN:HG3	1:A:2347:ASP:OD2	2.20	0.42
1:A:2382:LEU:HD23	1:A:2420:ALA:HB2	2.02	0.42
1:A:3717:LEU:HD23	1:A:3717:LEU:HA	1.85	0.42
1:A:1962:ARG:NH2	1:A:2314:ASN:OD1	2.53	0.42
1:A:2154:ILE:HB	1:A:2155:PRO:HD3	2.02	0.42
1:A:2934:LEU:HD23	1:A:3091:LEU:HD12	2.02	0.42
1:A:3835:ILE:HD13	1:A:3867:ALA:HA	2.02	0.42
1:A:2138:ILE:HD11	1:A:2165:PHE:CD1	2.55	0.41
1:A:2584:TRP:CH2	1:A:2732:PRO:HB2	2.55	0.41
1:A:2773:MET:HG2	1:A:2802:TRP:CE3	2.55	0.41
1:A:1646:ASN:OD1	1:A:1649:LYS:HG3	2.20	0.41
1:A:1901:GLY:HA3	1:A:2036:PHE:CD2	2.56	0.41
1:A:3495:THR:O	1:A:3499:GLN:NE2	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1713:LEU:HD23	1:A:1713:LEU:HA	1.93	0.41
1:A:2087:ASP:H	1:A:2148:LYS:HZ2	1.66	0.41
1:A:2519:ARG:HG3	1:A:2526:LEU:HD12	2.01	0.41
1:A:3500:MET:HE2	1:A:3500:MET:HB2	1.93	0.41
1:A:3868:PHE:CZ	1:A:4018:MET:HG2	2.55	0.41
1:A:3885:MET:HE3	1:A:4008:PHE:CD1	2.55	0.41
1:A:4084:ILE:O	1:A:4088:VAL:HG13	2.21	0.41
1:A:3537:GLN:HG3	1:A:3543:PHE:CE1	2.55	0.41
1:A:2107:ARG:O	1:A:2111:ILE:HG13	2.20	0.41
1:A:2231:SER:HA	1:A:2234:TRP:CD1	2.55	0.41
1:A:3607:ARG:NH2	1:A:3674:SER:O	2.54	0.41
1:A:4397:HIS:CE1	1:A:4418:LYS:HG3	2.55	0.41
1:A:2043:LYS:HA	1:A:2043:LYS:HD3	1.61	0.41
1:A:2596:PRO:HB2	1:A:2738:TYR:CZ	2.55	0.41
1:A:2750:THR:HA	1:A:2753:ARG:CZ	2.51	0.41
1:A:3786:GLU:O	1:A:3790:VAL:HG23	2.21	0.41
1:A:4096:LEU:HD13	1:A:4105:TRP:CH2	2.48	0.41
1:A:1508:LYS:HA	1:A:1513:TYR:CD1	2.53	0.41
1:A:1526:LYS:HD2	1:A:1589:MET:HE1	2.03	0.41
1:A:1564:GLU:HA	1:A:1567:ARG:HB2	2.03	0.41
1:A:3502:THR:HG22	1:A:3542:GLN:HB3	2.03	0.41
1:A:1914:GLU:HG2	2:A:4701:ADP:O1A	2.20	0.41
1:A:2279:LEU:HA	1:A:2698:GLN:HG3	2.02	0.41
1:A:2668:LEU:HD23	1:A:2668:LEU:HA	1.83	0.41
1:A:2671:MET:HG2	1:A:2677:GLN:HG3	2.03	0.41
1:A:3110:THR:O	1:A:3113:MET:HB2	2.21	0.41
1:A:3128:VAL:HA	1:A:3145:ASN:ND2	2.34	0.41
1:A:3831:PHE:HZ	1:A:3870:ARG:HB3	1.86	0.41
1:A:4381:HIS:HB2	1:A:4438:CYS:HB3	2.03	0.41
1:A:1512:TYR:O	1:A:1515:VAL:HG12	2.21	0.41
1:A:1903:SER:HA	1:A:2016:ILE:O	2.21	0.41
1:A:2138:ILE:HD13	1:A:2138:ILE:HA	1.87	0.41
1:A:2347:ASP:OD1	1:A:2349:LYS:HG2	2.21	0.41
1:A:2499:LEU:O	1:A:2503:SER:OG	2.31	0.41
1:A:4027:LEU:HD11	1:A:4043:MET:HE1	2.03	0.41
1:A:4340:ILE:HD13	1:A:4340:ILE:HA	1.89	0.41
1:A:2623:SER:OG	1:A:3006:GLU:OE1	2.39	0.40
1:A:2704:GLU:O	1:A:2706:ILE:HG13	2.22	0.40
1:A:2773:MET:HG2	1:A:2802:TRP:CD2	2.57	0.40
1:A:2811:ARG:N	1:A:2812:PRO:HD2	2.36	0.40
1:A:3476:THR:CG2	1:A:3480:LYS:HZ3	2.27	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3509:LEU:HB3	1:A:3529:PHE:CE1	2.57	0.40
1:A:3912:ASN:O	1:A:3937:ARG:NH1	2.54	0.40
1:A:4028:THR:HG23	1:A:4062:GLN:OE1	2.20	0.40
1:A:4100:HIS:CG	1:A:4129:GLU:HG2	2.56	0.40
1:A:4413:PHE:O	1:A:4417:VAL:HG23	2.21	0.40
1:A:2855:LEU:HD13	1:A:2855:LEU:HA	1.92	0.40
1:A:3207:LYS:HA	1:A:3207:LYS:HD3	1.86	0.40
1:A:4398:LEU:HB3	1:A:4410:PHE:CZ	2.57	0.40
1:A:1463:LEU:HD21	1:A:1507:MET:SD	2.61	0.40
1:A:2150:VAL:O	1:A:2154:ILE:HG13	2.21	0.40
1:A:2641:TYR:CZ	1:A:2650:LEU:HD13	2.56	0.40
1:A:2658:TRP:CE2	1:A:2705:ARG:HA	2.57	0.40
1:A:2775:GLU:OE1	1:A:2857:HIS:NE2	2.41	0.40
1:A:3158:ASN:ND2	1:A:3169:MET:O	2.48	0.40
1:A:3825:TYR:N	1:A:3825:TYR:CD1	2.90	0.40
1:A:1508:LYS:HG2	1:A:1513:TYR:CZ	2.57	0.40
1:A:1985:HIS:CD2	1:A:1997:ILE:HG13	2.57	0.40
1:A:2222:MET:HG2	1:A:2364:PHE:CE1	2.57	0.40
1:A:2804:ARG:NH2	1:A:2811:ARG:HH22	2.19	0.40
1:A:3568:PRO:HG2	1:A:3573:CYS:SG	2.61	0.40
1:A:4578:SER:O	1:A:4638:ARG:NH2	2.54	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%)	2890 (99%)	39 (1%)	0	100	100

There are no Ramachandran outliers to report.

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%)	2583 (99%)	22 (1%)	79 93

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1499	GLU
1	A	1607	LEU
1	A	1873	LEU
1	A	1876	GLN
1	A	2509	LYS
1	A	2552	VAL
1	A	2609	LEU
1	A	2666	ILE
1	A	2734	VAL
1	A	3044	LEU
1	A	3117	LYS
1	A	3503	ILE
1	A	3550	THR
1	A	3560	LEU
1	A	3644	VAL
1	A	3800	GLN
1	A	4043	MET
1	A	4137	ASN
1	A	4191	GLN
1	A	4311	LEU
1	A	4345	LYS
1	A	4574	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1894	GLN
1	A	1922	GLN
1	A	1950	GLN

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Mol	Chain	Res	Type
1	A	2003	ASN
1	A	2134	GLN
1	A	2212	GLN
1	A	2217	ASN
1	A	2439	HIS
1	A	2442	GLN
1	A	2464	GLN
1	A	2482	GLN
1	A	2554	GLN
1	A	2707	GLN
1	A	2928	GLN
1	A	2960	GLN
1	A	3063	HIS
1	A	3092	ASN
1	A	3182	HIS
1	A	3188	HIS
1	A	3202	ASN
1	A	3584	ASN
1	A	3878	GLN
1	A	4114	HIS
1	A	4174	ASN
1	A	4231	GLN
1	A	4307	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	$\# Z > 2$
2	ADP	A	4703	-	24,29,29	0.90	0	29,45,45	1.21	2 (6%)
2	ADP	A	4704	-	24,29,29	0.93	1 (4%)	29,45,45	1.20	2 (6%)
3	ATP	A	4702	4	28,33,33	0.67	0	34,52,52	0.58	1 (2%)
2	ADP	A	4701	4	24,29,29	0.91	1 (4%)	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	4703	-	-	1/12/32/32	0/3/3/3
2	ADP	A	4704	-	-	1/12/32/32	0/3/3/3
3	ATP	A	4702	4	-	4/18/38/38	0/3/3/3
2	ADP	A	4701	4	-	3/12/32/32	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	4704	ADP	PA-O3A	2.04	1.61	1.59
2	A	4701	ADP	PA-O3A	2.00	1.61	1.59

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	4703	ADP	N3-C2-N1	-3.77	123.56	128.67
2	A	4701	ADP	N3-C2-N1	-3.70	123.65	128.67
2	A	4704	ADP	N3-C2-N1	-3.69	123.67	128.67
2	A	4704	ADP	C4-C5-N7	-2.54	106.65	109.34
2	A	4701	ADP	C4-C5-N7	-2.46	106.73	109.34
2	A	4703	ADP	C4-C5-N7	-2.44	106.76	109.34
3	A	4702	ATP	C5-C6-N6	2.28	123.79	120.31

There are no chirality outliers.

All (9) torsion outliers are listed below:

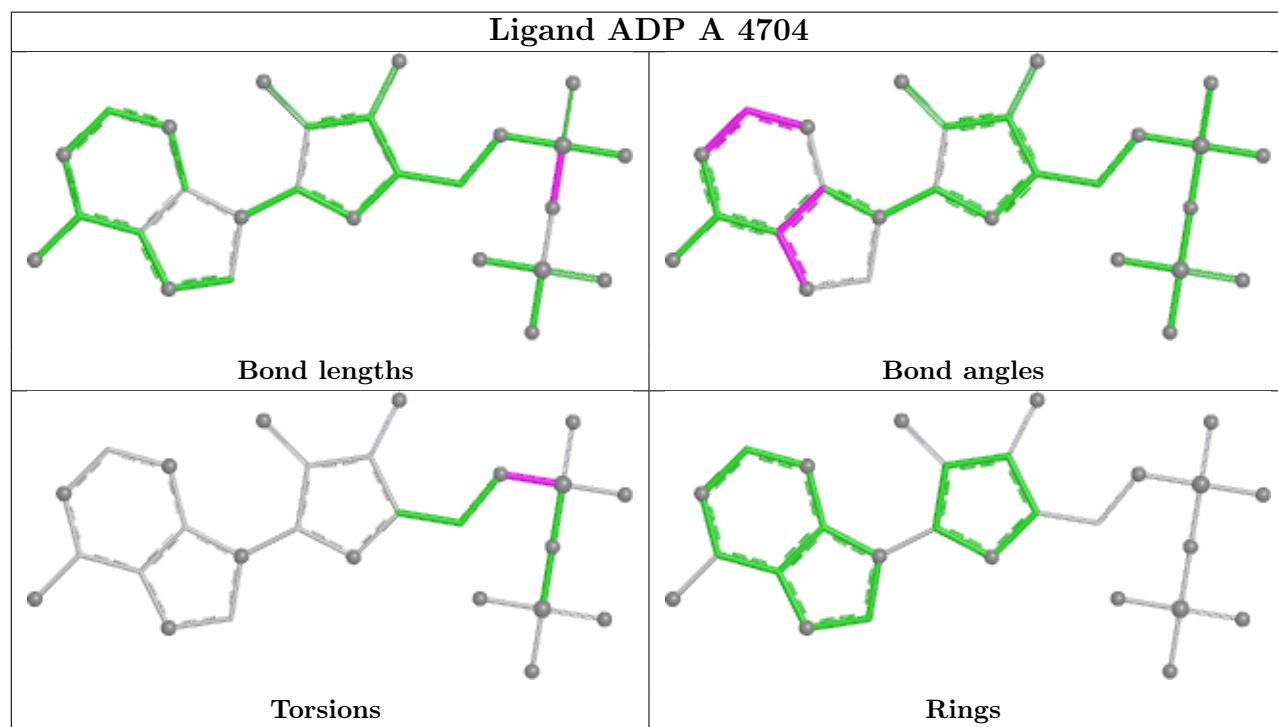
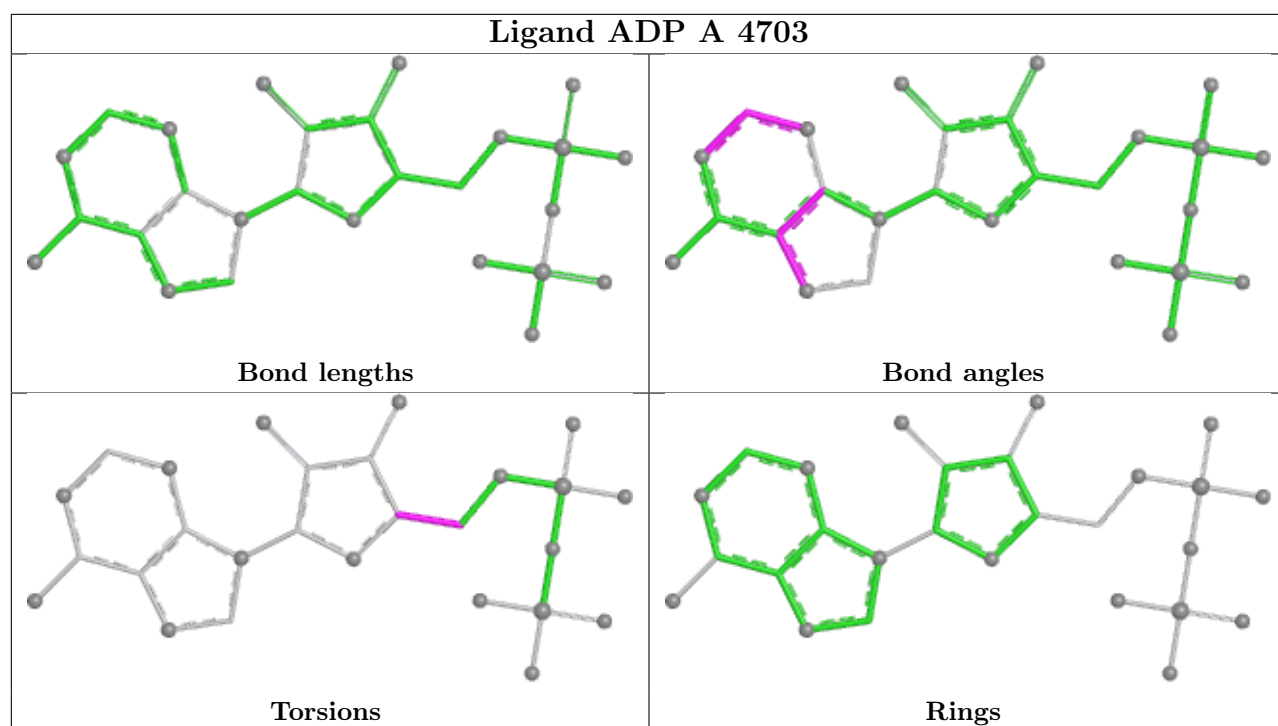
Mol	Chain	Res	Type	Atoms
2	A	4701	ADP	C5'-O5'-PA-O1A
2	A	4701	ADP	C5'-O5'-PA-O2A
2	A	4701	ADP	C5'-O5'-PA-O3A
3	A	4702	ATP	O4'-C4'-C5'-O5'
3	A	4702	ATP	PA-O3A-PB-O1B
3	A	4702	ATP	C3'-C4'-C5'-O5'
2	A	4704	ADP	C5'-O5'-PA-O1A
3	A	4702	ATP	PA-O3A-PB-O2B
2	A	4703	ADP	O4'-C4'-C5'-O5'

There are no ring outliers.

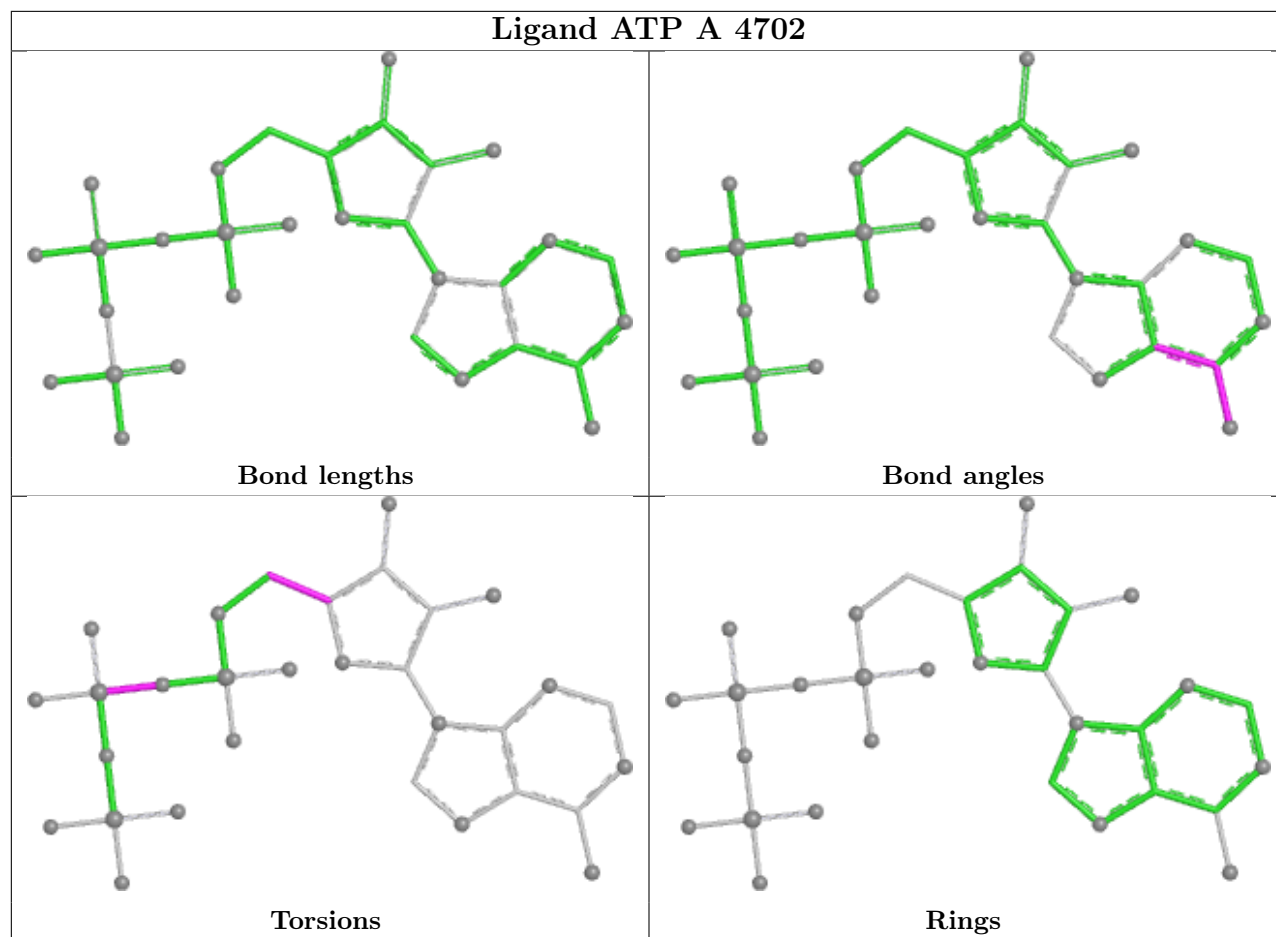
2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	4702	ATP	1	0
2	A	4701	ADP	3	0

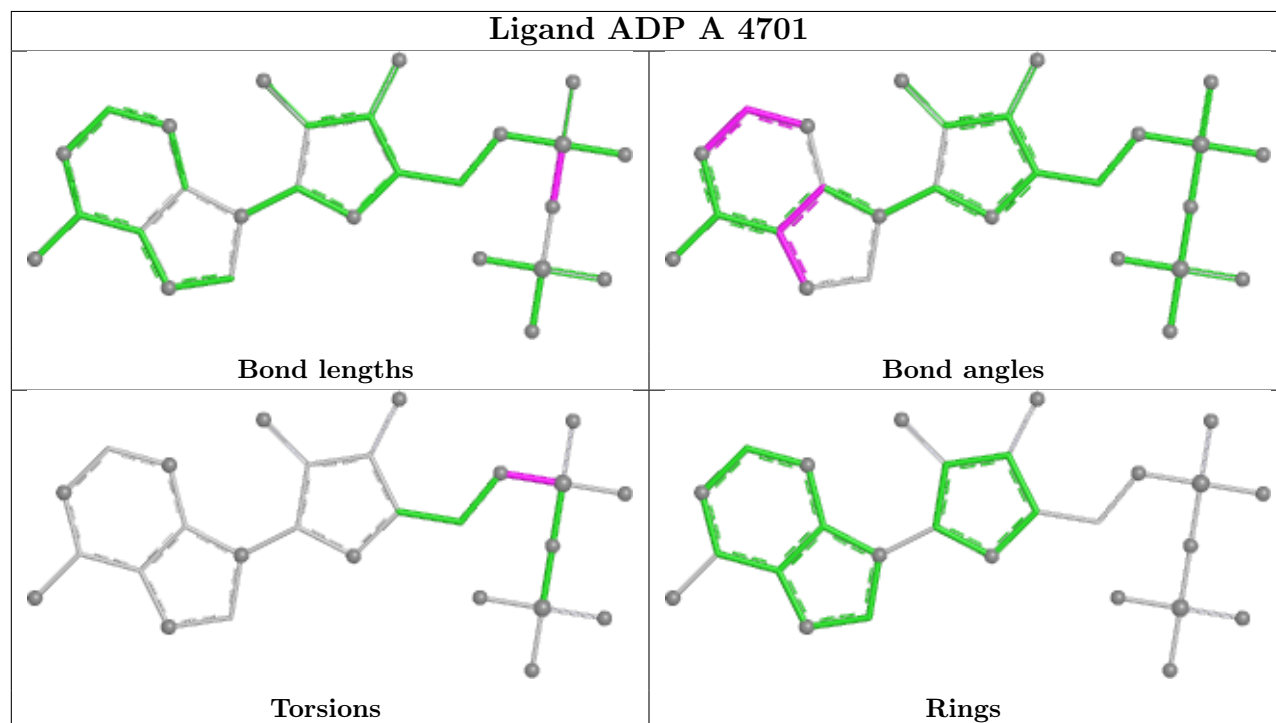
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.



Ligand ATP A 4702



Ligand ADP A 4701



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.

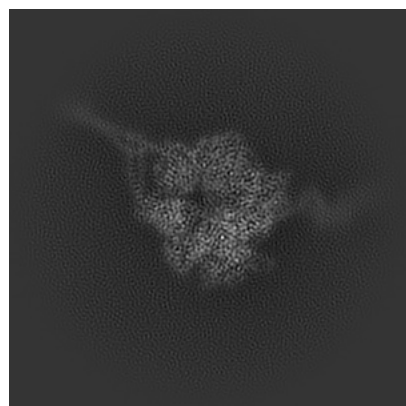
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44683. These allow visual inspection of the internal detail of the map and identification of artifacts.

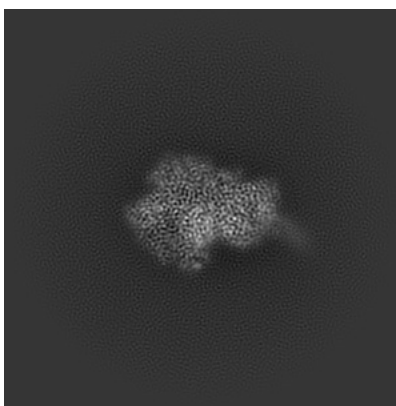
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

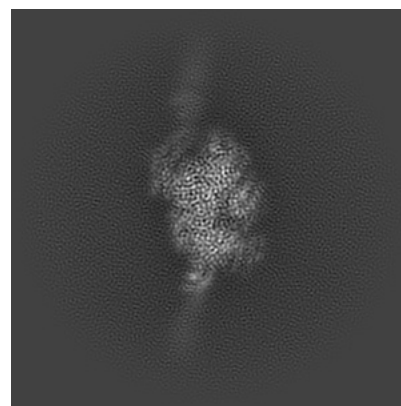
6.1.1 Primary map



X

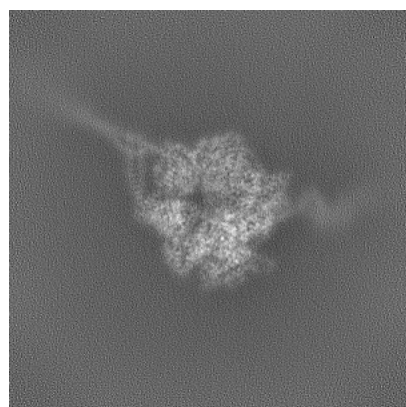


Y

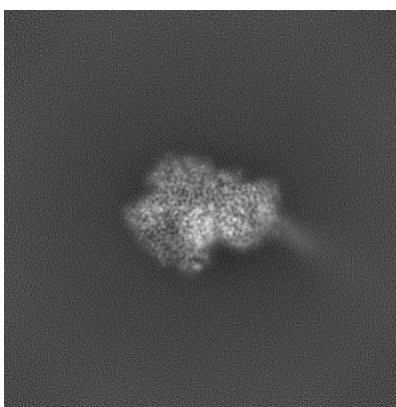


Z

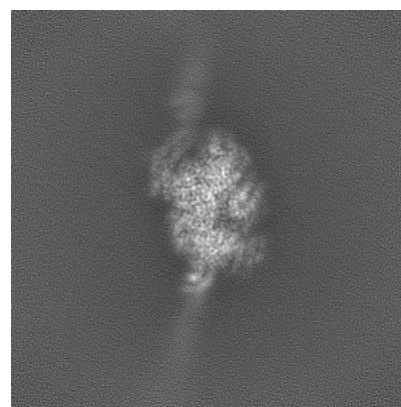
6.1.2 Raw map



X



Y

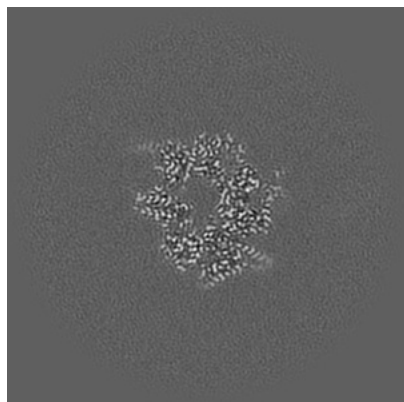


Z

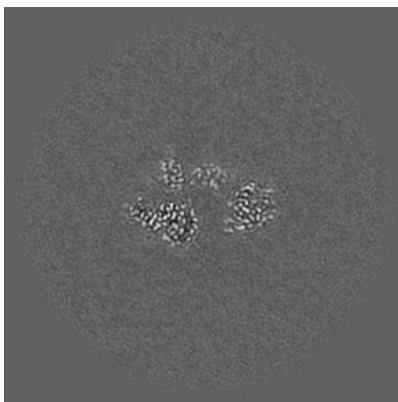
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

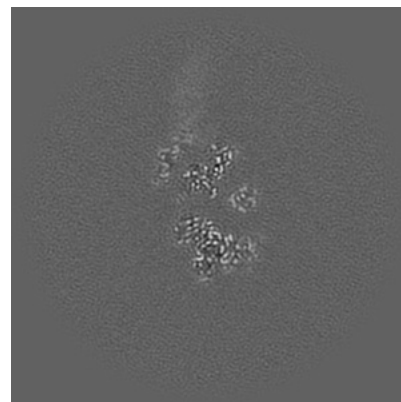
6.2.1 Primary map



X Index: 200

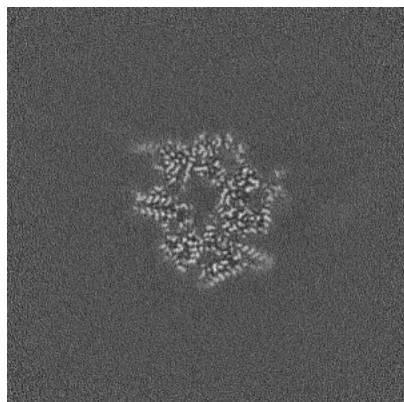


Y Index: 200

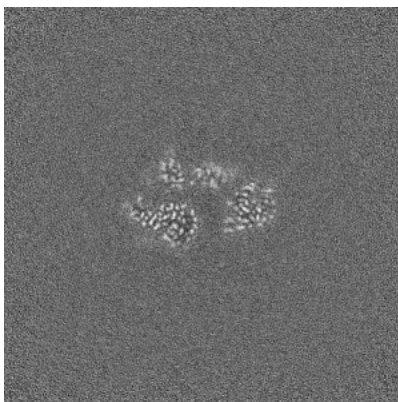


Z Index: 200

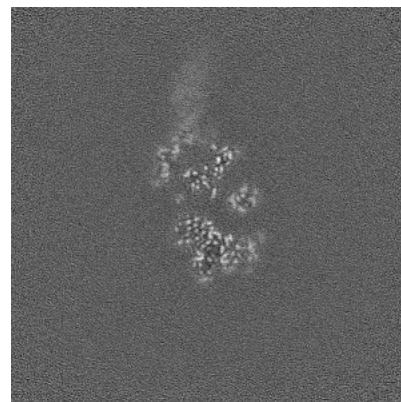
6.2.2 Raw map



X Index: 200



Y Index: 200

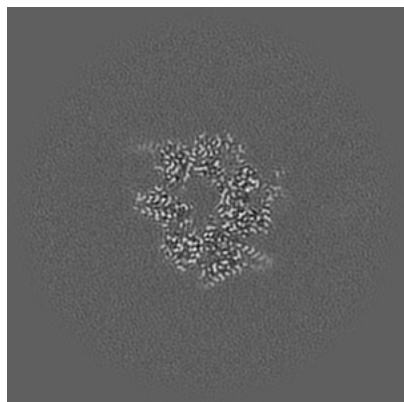


Z Index: 200

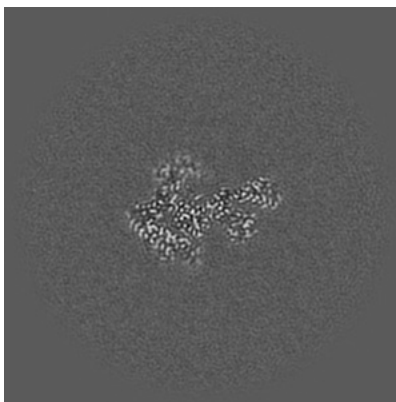
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

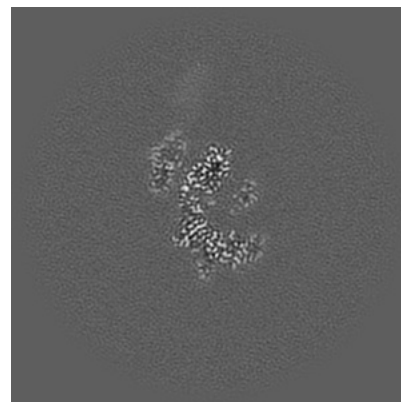
6.3.1 Primary map



X Index: 200

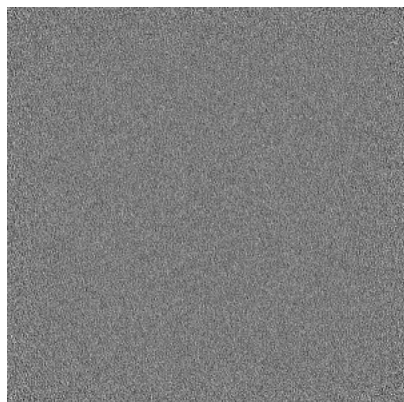


Y Index: 220

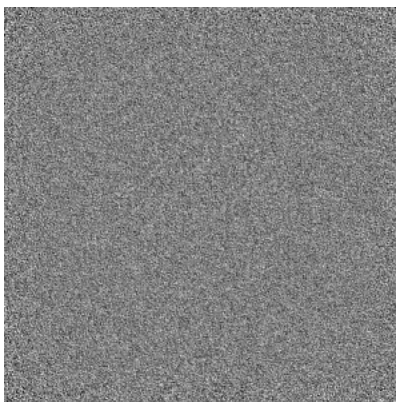


Z Index: 190

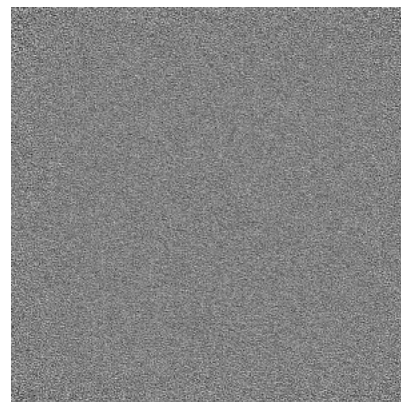
6.3.2 Raw map



X Index: 0



Y Index: 0

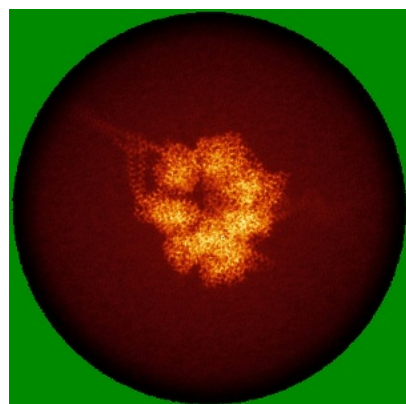


Z Index: 0

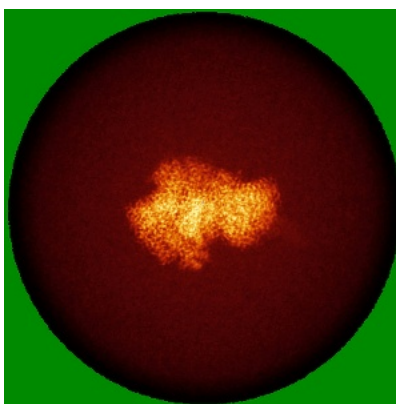
The images above show the largest variance slices of the map in three orthogonal directions.

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

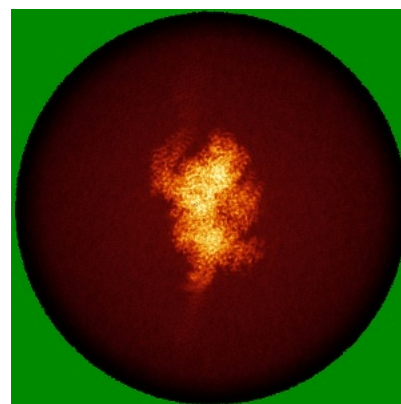
6.4.1 Primary map



X

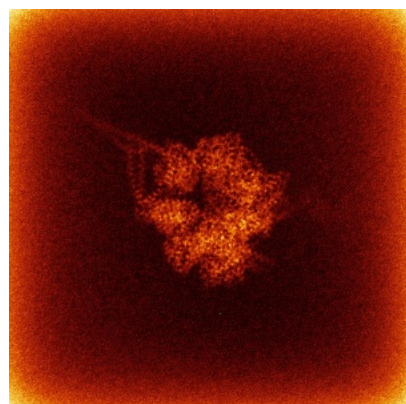


Y

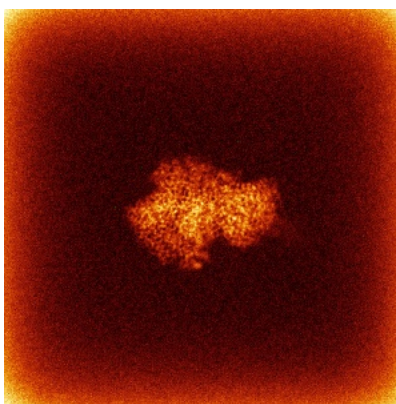


Z

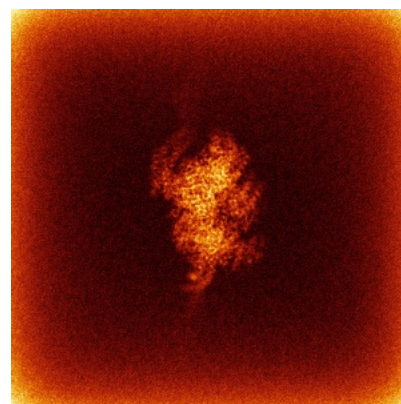
6.4.2 Raw map



X



Y

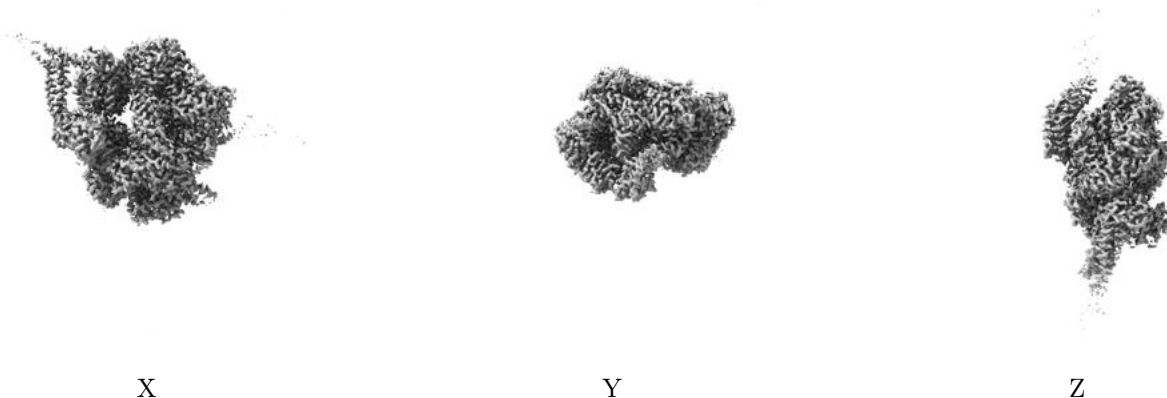


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

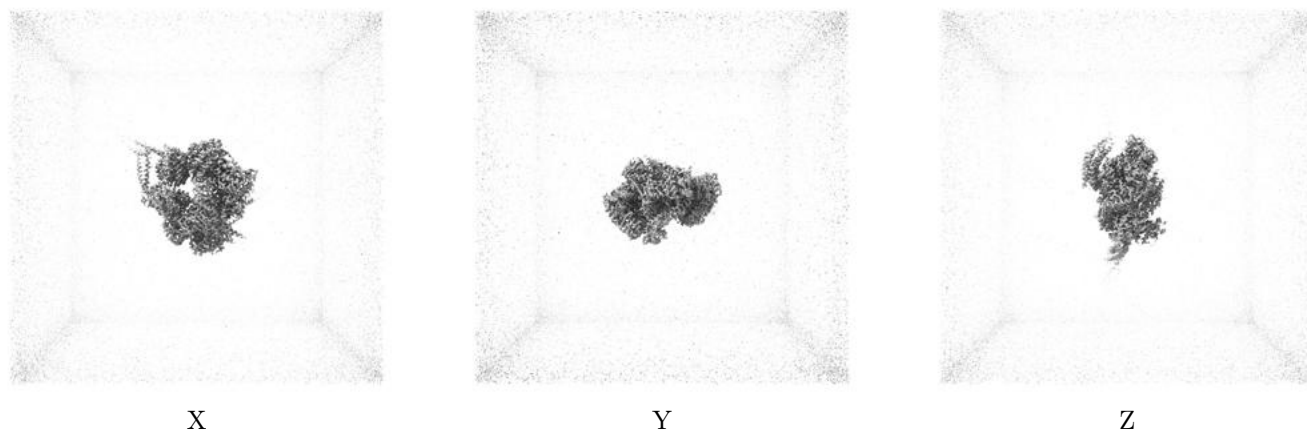
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.2. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

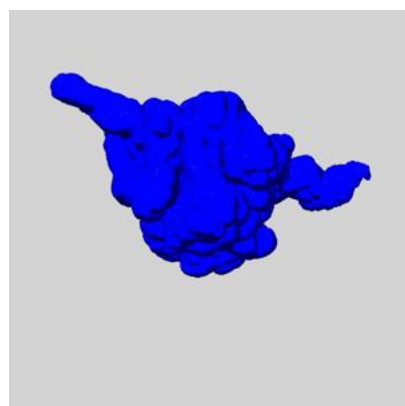
6.6 Mask visualisation [i](#)

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

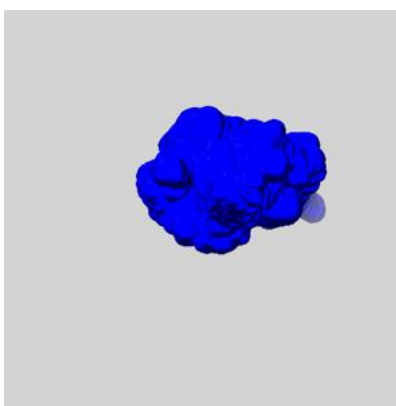
A mask typically either:

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

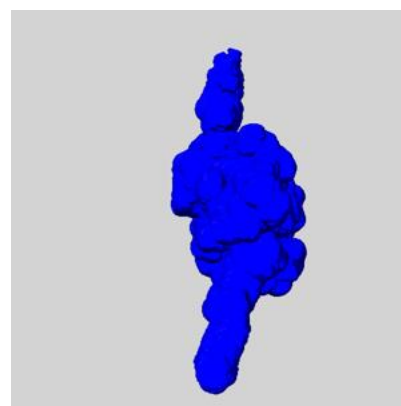
6.6.1 emd_44683_msk_1.map [i](#)



X



Y

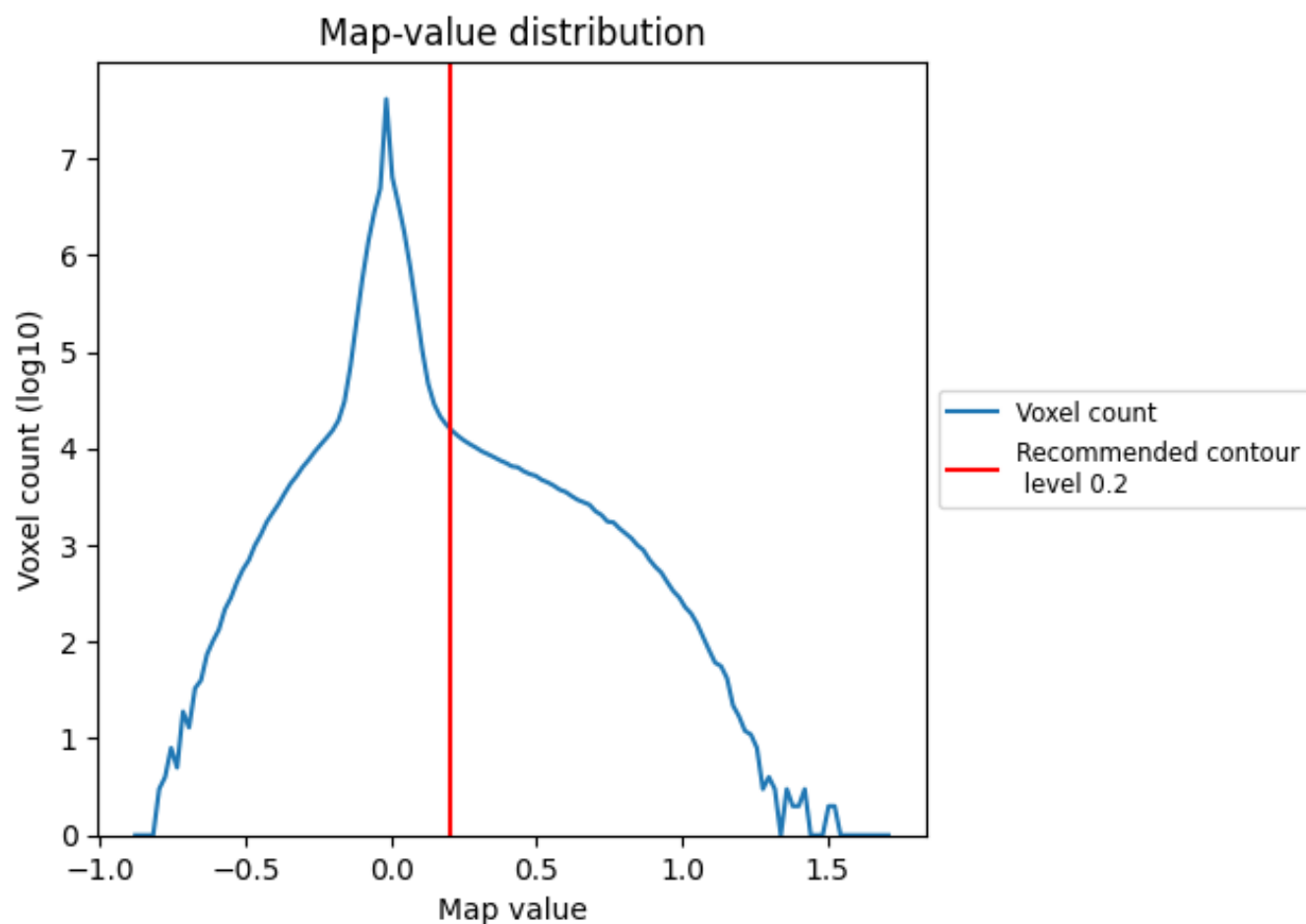


Z

7 Map analysis [i](#)

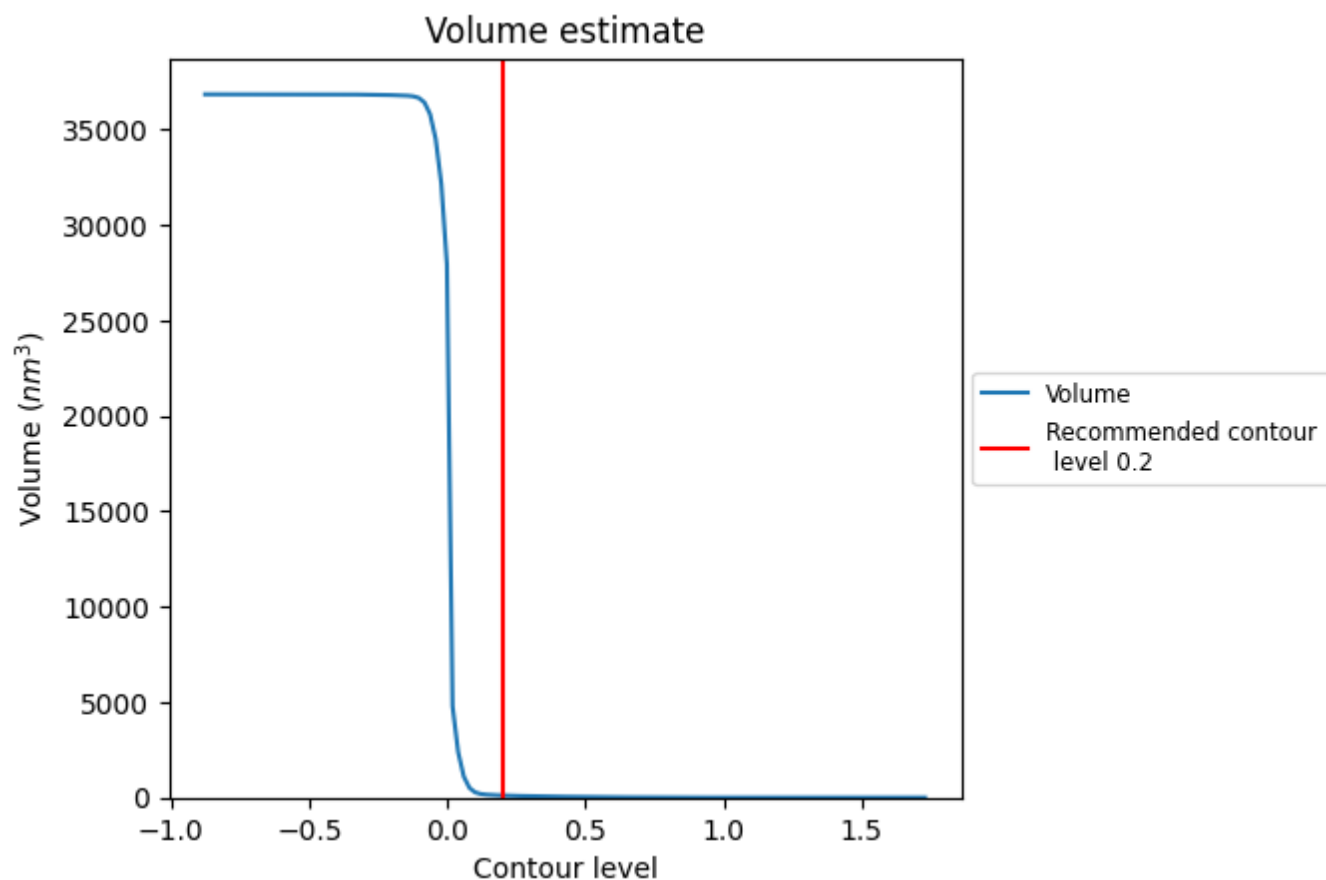
This section contains the results of statistical analysis of the map.

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.

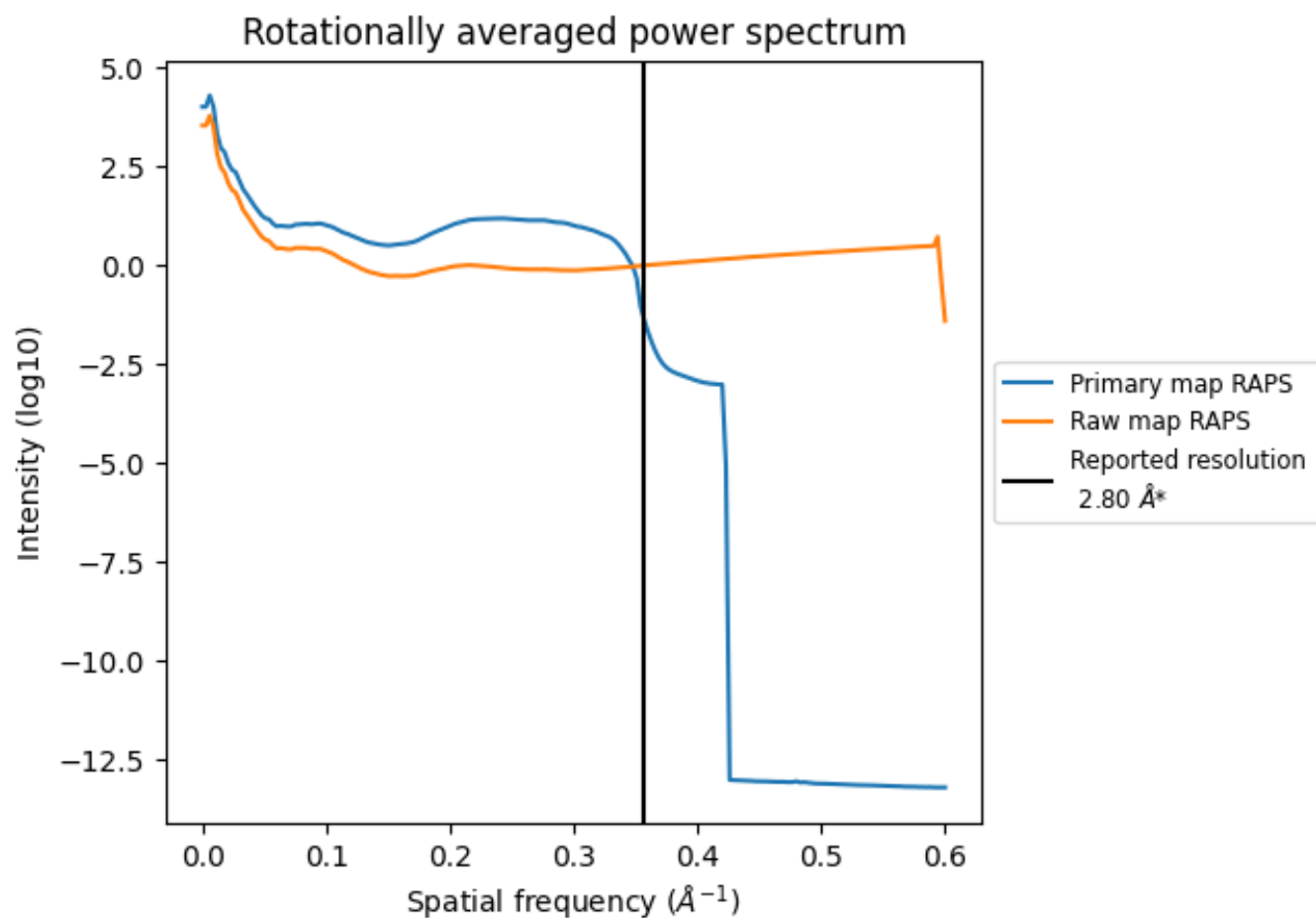
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 110 nm^3 ; this corresponds to an approximate mass of 99 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 ⓘ

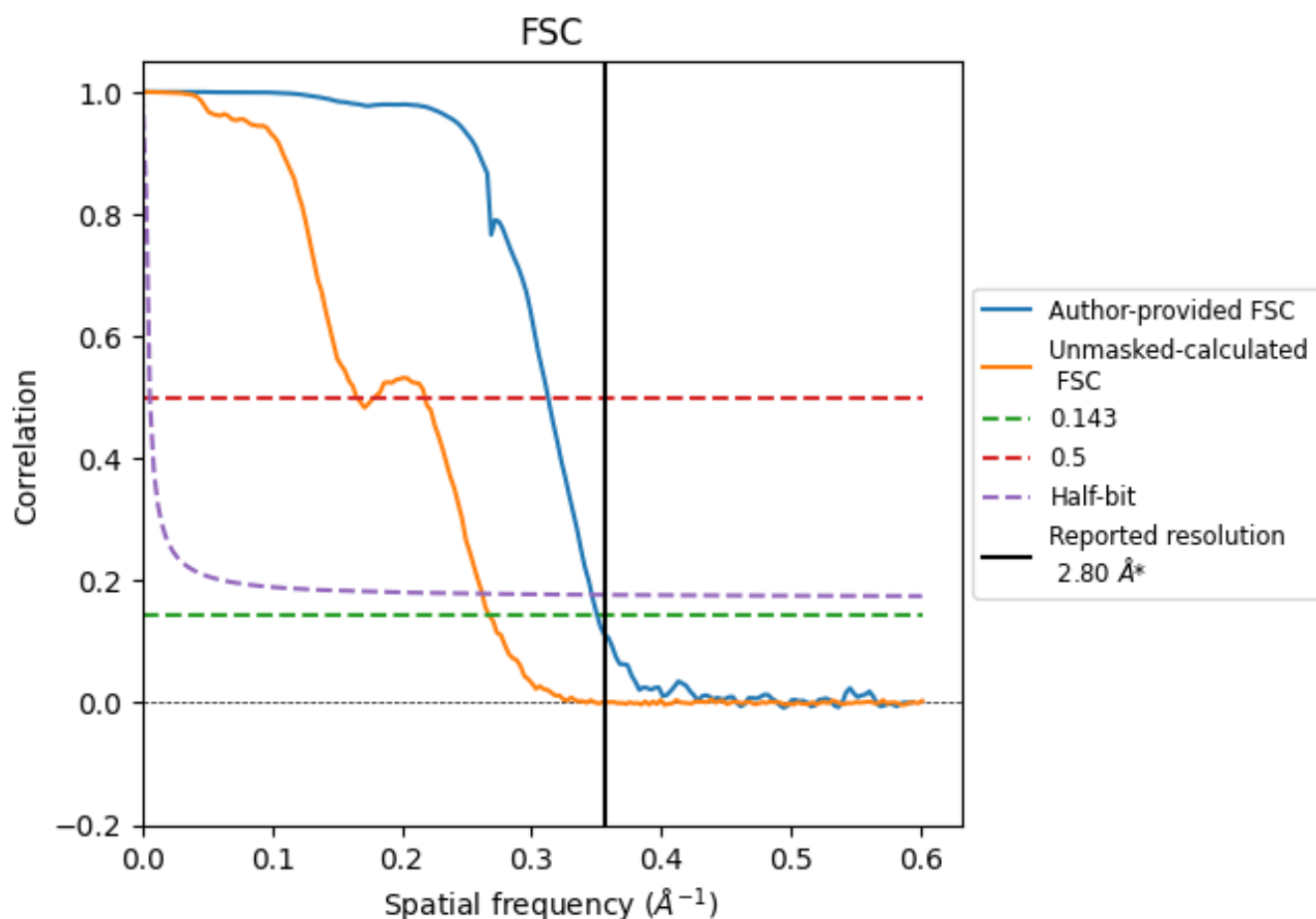


*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

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 0.357 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

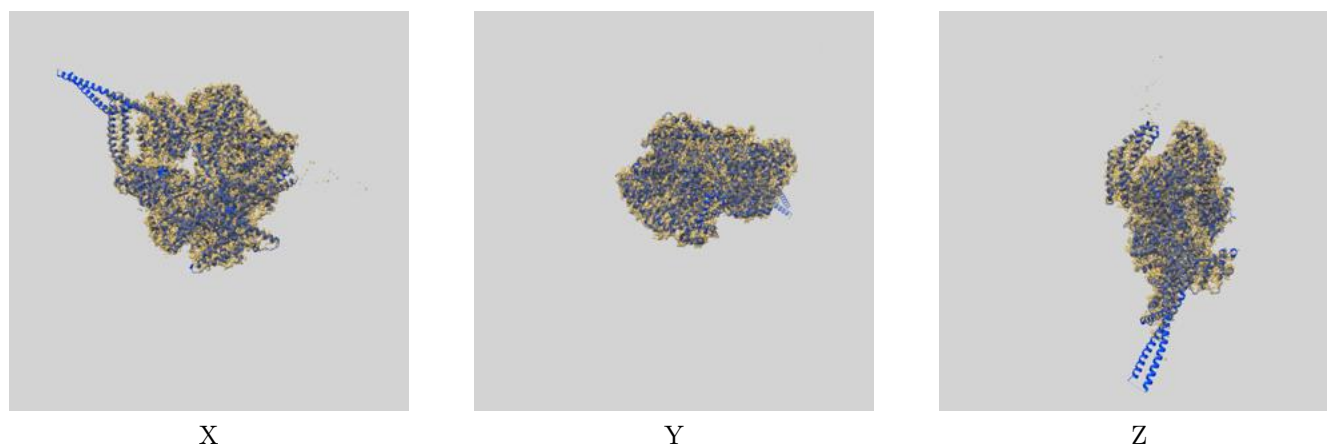
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	2.85	3.20	2.89
Unmasked-calculated*	3.74	6.06	3.82

*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 3.74 differs from the reported value 2.8 by more than 10 %

9 Map-model fit [i](#)

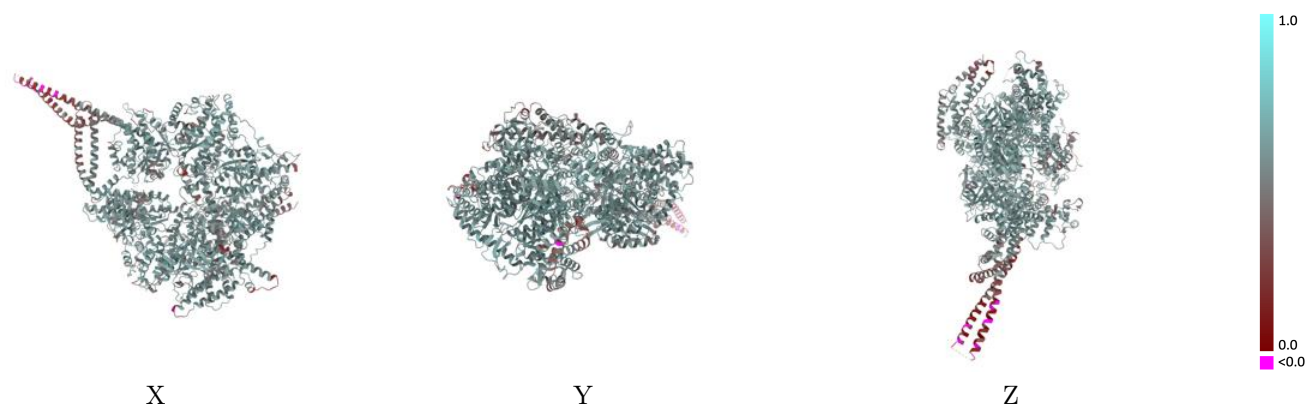
This section contains information regarding the fit between EMDB map EMD-44683 and PDB model 9BM0. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay [i](#)



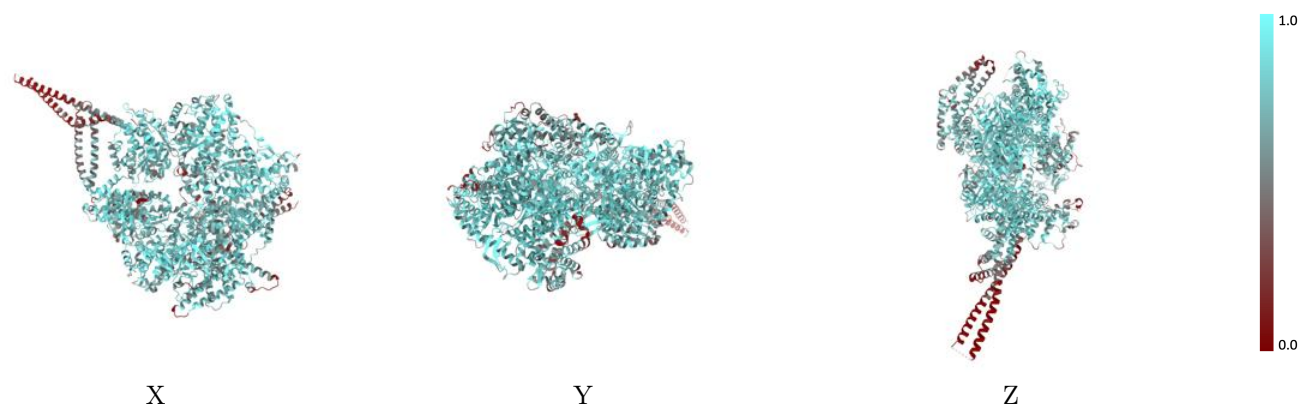
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



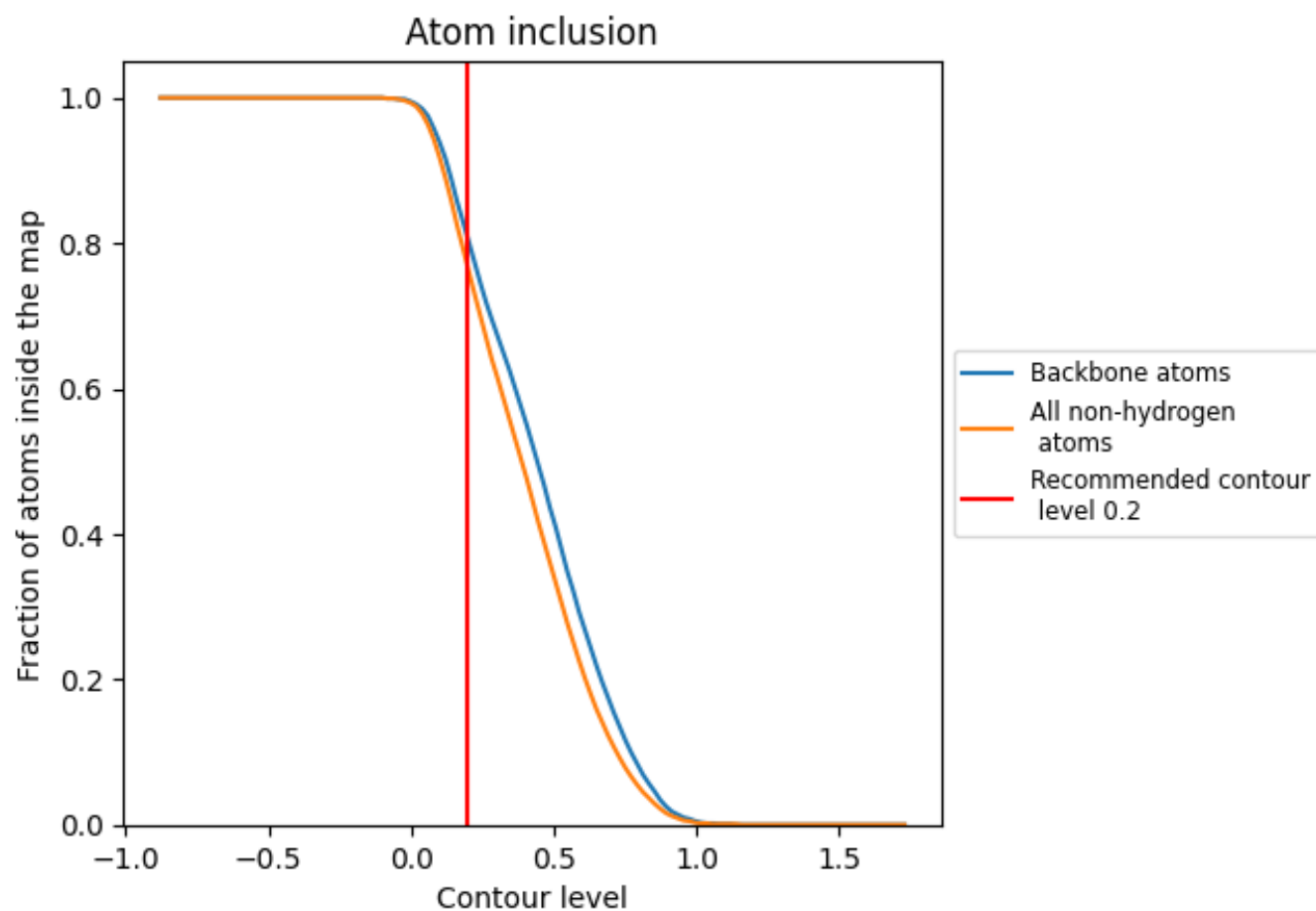
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.2).

9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7640	0.5560
A	0.7640	0.5560

