Full wwPDB EM Validation Report ⓘ

May 6, 2025 – 02:16 AM EDT

PDB ID	:	8GMJ / pdb_00008gmj
EMDB ID	:	EMD-40227
Title	:	CryoEM structure of P-Glycoprotein in collapsed closed state under continuous turnover conditions with verapamil
Authors	:	Culbertson, A.; Liao, M.
Deposited on	:	2023-03-26
Resolution	:	4.40 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:

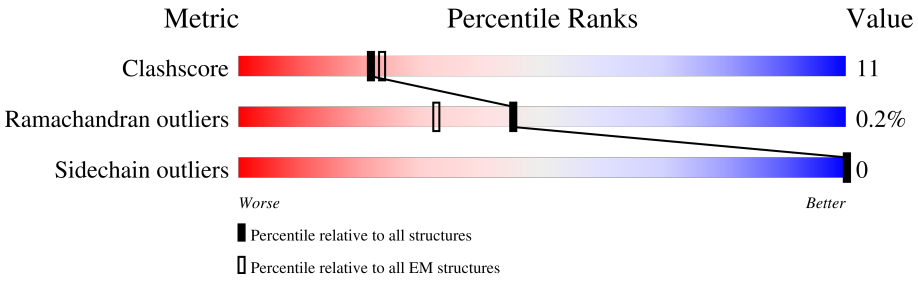
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.40 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 <=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	1280	38% 80% 9% 11%

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	1304	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7960 atoms, of which 2194 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.

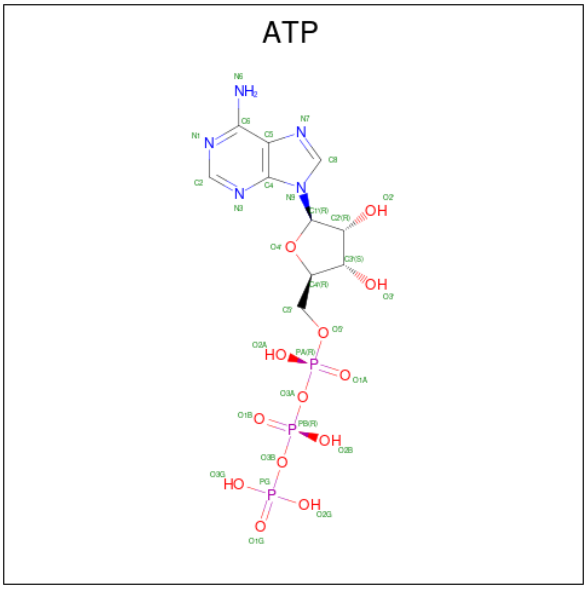
- Molecule 1 is a protein called ATP-dependent translocase ABCB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
1	A	1145	7872	3408	2170	1145	1149	0	0

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
2	A	2	2	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).



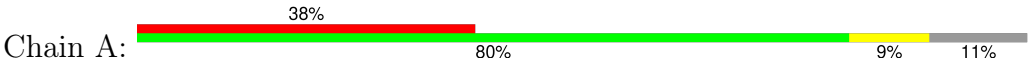
Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
3	A	1	43	10	12	5	13	3	0
3	A	1	Total 43	C 10	H 12	N 5	O 13	P 3	0

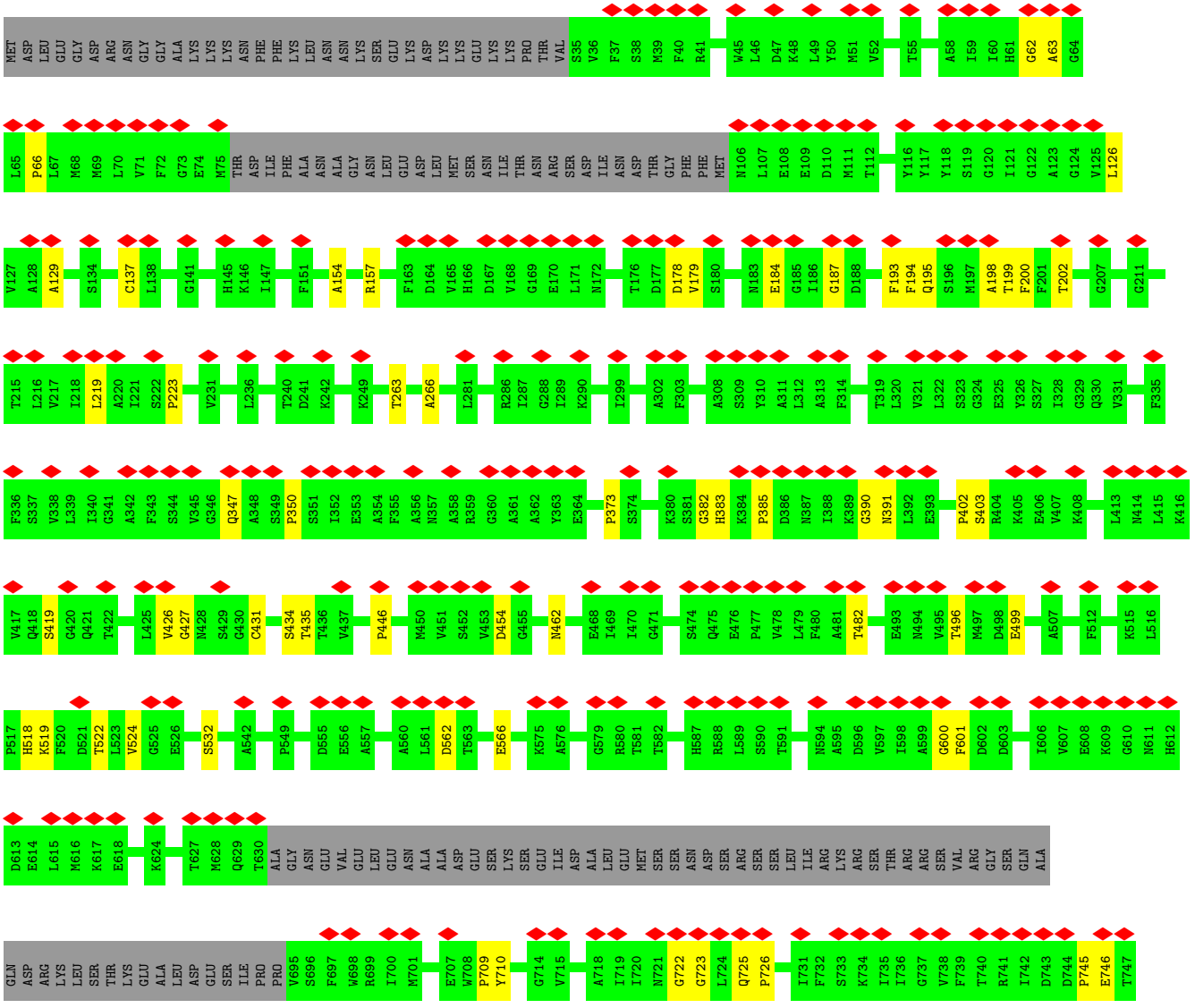
3 Residue-property plots (i)

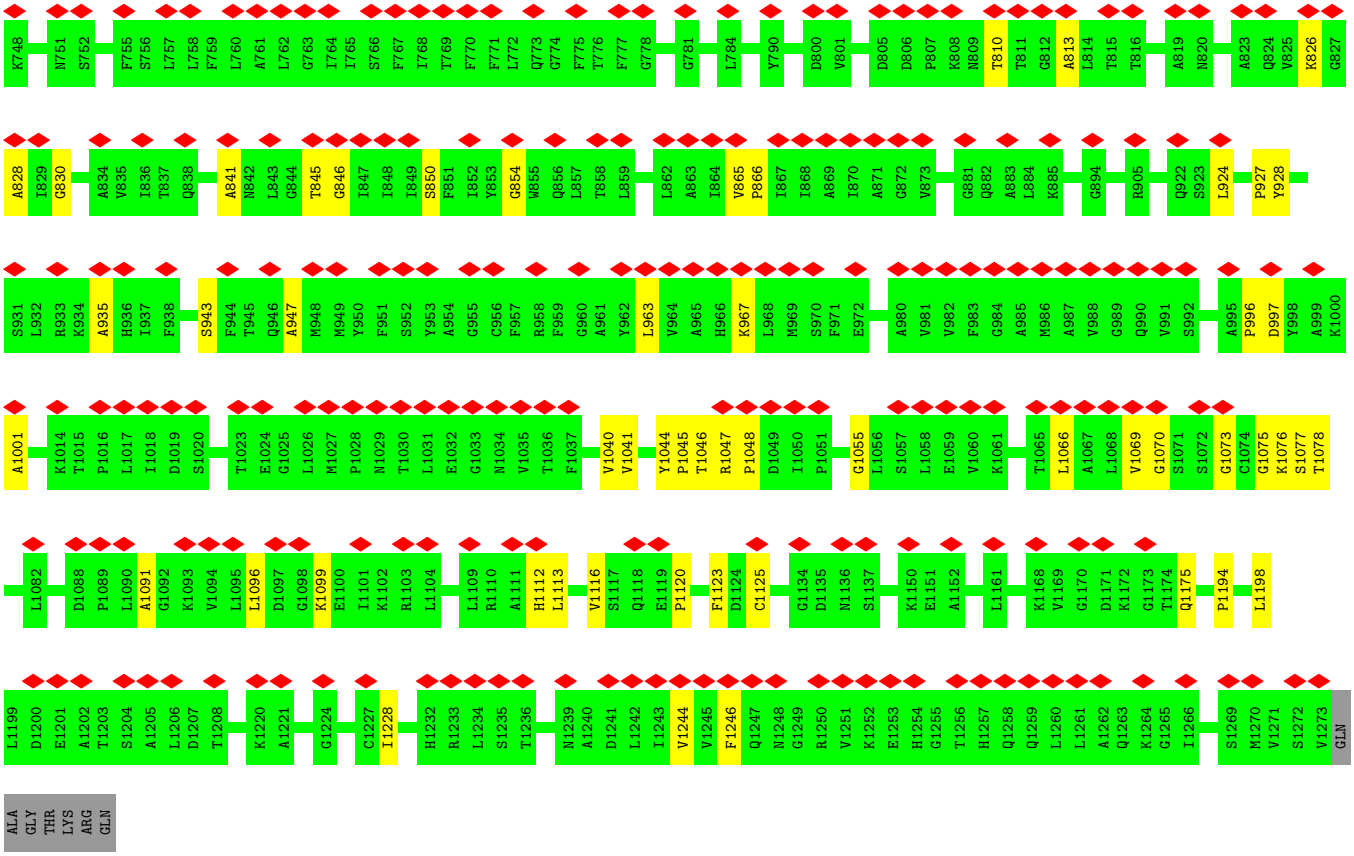
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: ATP-dependent translocase ABCB1

Chain A:






K748 N751 S752 F755 S756 L757 L758 F759 L760 A761 L762 G763 I764 I765 S766 F767 I768 T769 F770 F771 L772 Q773 G774 F775 T776 F777 G778 G781 L784 Y790 D800 V801 D805 D806 P807 K808 N809 T810 T811 G812 A813 L814 T815 T816 A819 N820 A823 Q824 V825 K826 G827
A828 I829 G830 A834 V835 I836 T837 Q838 A841 N842 L843 G844 T845 G846 I847 I848 I849 S850 F851 I852 Y853 G854 W855 Q856 L857 T858 L859 L862 A863 I864 V865 P866 I867 I868 A869 I870 A871 G872 V873 G881 Q882 A883 L884 K885 G894 R905 Q922 S923 L924 P927 Y928
S931 L932 R933 K934 A935 H936 I937 F938 S943 F944 T945 Q946 A947 M948 M949 Y950 F951 S952 Y953 A954 G955 C956 F957 R958 F959 G960 A961 Y962 L963 V964 A965 H966 K967 L968 M969 S970 F971 E972 A980 V981 V982 F983 G984 A985 M986 A987 V988 G989 Q990 V991 S992 A995 P996 D997 Y998 A999 K1000
A1001 K1014 T1015 P1016 L1017 I1018 D1019 S1020 T1023 E1024 G1025 L1026 M1027 P1028 N1029 T1030 L1031 E1032 G1033 N1034 V1035 T1036 F1037 V1040 V1041 Y1044 P1045 T1046 R1047 P1048 D1049 I1050 P1051 G1055 L1056 S1057 L1058 E1059 V1060 K1061 T1065 L1066 A1067 L1068 V1069 G1070 S1071 S1072 G1073 C1074 G1075 K1076 S1077 T1078
L1082 D1088 P1089 L1090 A1091 G1092 K1093 V1094 L1095 L1096 D1097 G1098 K1099 E1100 I1101 K1102 R1103 L1104 L1109 R1110 A1111 H1112 L1113 V1116 S1117 Q1118 E1119 P1120 F1123 D1124 C1125 G1134 D1135 N1136 S1137 K1150 E1151 A1152 L1161 K1168 V1169 G1170 D1171 K1172 G1173 T1174 Q1175 P1194 L1198
L1199 D1200 E1201 A1202 T1203 S1204 A1205 L1206 D1207 T1208 K1220 A1221 G1224 C1227 I1228 H1232 R1233 L1234 S1235 T1236 N1239 A1240 D1241 L1242 I1243 V1244 V1245 F1246 Q1247 N1248 G1249 R1250 V1251 K1252 E1253 H1254 G1255 T1256 H1257 Q1258 Q1259 L1260 L1261 A1262 Q1263 K1264 G1265 I1266 S1269 M1270 V1271 S1272 V1273 GLN
ALA GLY THR LYS ARG GLN

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	33409	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.133	Depositor
Minimum map value	-0.068	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.049	Depositor
Map size (Å)	128.26, 126.13999, 155.81999	wwPDB
Map dimensions	121, 119, 147	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.38	0/5727	0.60	0/7978

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	5702	2170	2848	98	0
2	A	2	0	0	0	0
3	A	62	24	24	12	0
All	All	5766	2194	2872	98	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 11.

All (98) 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:1077:SER:HB2	3:A:1304:ATP:PA	2.16	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:726:PRO:HB3	1:A:846:GLY:HA2	1.58	0.83
1:A:726:PRO:HG3	1:A:845:THR:C	2.02	0.83
1:A:996:PRO:HD2	1:A:997:ASP:H	1.48	0.79
1:A:62:GLY:HA3	1:A:195:GLN:O	1.83	0.78
1:A:63:ALA:HB2	1:A:198:ALA:HB1	1.67	0.75
1:A:435:THR:N	3:A:1303:ATP:O2A	2.19	0.75
1:A:1040:VAL:C	1:A:1055:GLY:HA2	2.14	0.73
1:A:126:LEU:CB	1:A:947:ALA:HB2	2.20	0.72
1:A:391:ASN:O	1:A:454:ASP:N	2.23	0.71
1:A:726:PRO:CB	1:A:846:GLY:HA2	2.20	0.70
1:A:709:PRO:HD2	1:A:710:TYR:H	1.57	0.70
1:A:828:ALA:HB2	1:A:1001:ALA:HB2	1.75	0.68
1:A:382:GLY:HA3	1:A:462:ASN:HA	1.73	0.68
1:A:1096:LEU:N	1:A:1099:LYS:O	2.26	0.68
1:A:402:PRO:HD2	1:A:403:SER:H	1.57	0.67
1:A:390:GLY:O	1:A:419:SER:N	2.29	0.66
1:A:745:PRO:HD2	1:A:746:GLU:H	1.59	0.66
1:A:426:VAL:O	1:A:600:GLY:HA2	1.98	0.62
1:A:726:PRO:HG3	1:A:846:GLY:N	2.14	0.62
1:A:1041:VAL:O	1:A:1091:ALA:N	2.26	0.61
1:A:927:PRO:HD2	1:A:928:TYR:H	1.66	0.61
1:A:963:LEU:O	1:A:967:LYS:N	2.35	0.60
1:A:1077:SER:HB2	3:A:1304:ATP:O1A	2.01	0.59
1:A:1075:GLY:HA2	3:A:1304:ATP:H5'1	1.88	0.56
1:A:828:ALA:CB	1:A:1001:ALA:HB2	2.35	0.55
1:A:722:GLY:HA3	1:A:841:ALA:C	2.32	0.54
1:A:1041:VAL:N	1:A:1091:ALA:O	2.33	0.54
1:A:722:GLY:HA3	1:A:841:ALA:HB1	1.89	0.54
1:A:1077:SER:HB2	3:A:1304:ATP:O2A	2.07	0.54
1:A:865:VAL:N	1:A:866:PRO:HD2	2.22	0.54
1:A:1069:VAL:O	1:A:1246:PHE:N	2.41	0.54
1:A:924:LEU:O	1:A:927:PRO:HD2	2.08	0.53
1:A:1116:VAL:N	1:A:1198:LEU:O	2.38	0.53
1:A:1044:TYR:HB2	1:A:1047:ARG:CB	2.38	0.53
1:A:723:GLY:HA2	1:A:845:THR:CB	2.39	0.53
1:A:482:THR:O	1:A:524:VAL:N	2.40	0.52
1:A:178:ASP:O	1:A:179:VAL:C	2.52	0.52
1:A:383:HIS:O	1:A:462:ASN:N	2.35	0.52
1:A:1073:GLY:HA2	3:A:1304:ATP:O1B	2.10	0.52
1:A:66:PRO:HG3	1:A:199:THR:O	2.09	0.52
1:A:66:PRO:HG2	1:A:202:THR:CB	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1112:HIS:O	1:A:1194:PRO:HB3	2.10	0.50
1:A:810:THR:H	1:A:813:ALA:HB3	1.75	0.49
1:A:518:HIS:O	1:A:522:THR:N	2.46	0.49
1:A:745:PRO:HD2	1:A:746:GLU:N	2.27	0.49
1:A:1123:PHE:O	1:A:1125:CYS:N	2.46	0.49
1:A:1075:GLY:O	1:A:1078:THR:N	2.45	0.49
1:A:402:PRO:HD2	1:A:403:SER:N	2.25	0.49
1:A:996:PRO:HD2	1:A:997:ASP:N	2.22	0.48
1:A:722:GLY:HA3	1:A:841:ALA:CB	2.44	0.48
1:A:434:SER:HB2	3:A:1303:ATP:O2A	2.14	0.47
1:A:726:PRO:HB3	1:A:846:GLY:CA	2.37	0.47
1:A:427:GLY:HA3	1:A:601:PHE:CB	2.43	0.47
1:A:709:PRO:HD2	1:A:710:TYR:N	2.28	0.47
1:A:850:SER:O	1:A:854:GLY:N	2.44	0.47
1:A:62:GLY:HA3	1:A:195:GLN:C	2.40	0.46
1:A:828:ALA:CB	1:A:1001:ALA:CB	2.93	0.46
1:A:154:ALA:O	1:A:157:ARG:N	2.49	0.46
1:A:562:ASP:O	1:A:566:GLU:N	2.32	0.46
1:A:810:THR:N	1:A:813:ALA:HB3	2.30	0.46
1:A:385:PRO:HD2	1:A:385:PRO:O	2.15	0.46
1:A:1047:ARG:N	1:A:1048:PRO:CD	2.78	0.46
1:A:137:CYS:CB	1:A:935:ALA:HB1	2.45	0.46
1:A:1113:LEU:HA	1:A:1194:PRO:HB2	1.96	0.46
1:A:129:ALA:HB3	1:A:943:SER:CB	2.46	0.45
1:A:1120:PRO:O	1:A:1120:PRO:HD2	2.17	0.45
1:A:446:PRO:HD2	1:A:446:PRO:O	2.17	0.45
1:A:62:GLY:O	1:A:66:PRO:HD2	2.17	0.45
1:A:1076:LYS:CB	3:A:1304:ATP:O2B	2.65	0.45
1:A:263:THR:O	1:A:266:ALA:HB3	2.17	0.45
1:A:1073:GLY:CA	3:A:1304:ATP:O1B	2.64	0.45
1:A:347:GLN:O	1:A:350:PRO:HD2	2.17	0.44
1:A:1066:LEU:O	1:A:1228:ILE:HA	2.17	0.44
1:A:431:CYS:CB	1:A:601:PHE:CB	2.95	0.44
1:A:373:PRO:O	1:A:373:PRO:HD2	2.18	0.44
1:A:1045:PRO:O	1:A:1048:PRO:HD3	2.17	0.44
1:A:826:LYS:O	1:A:830:GLY:N	2.51	0.43
1:A:722:GLY:CA	1:A:841:ALA:C	2.92	0.43
1:A:1070:GLY:HA3	1:A:1246:PHE:CB	2.49	0.43
1:A:1175:GLN:O	3:A:1303:ATP:C4	2.71	0.43
1:A:1069:VAL:N	1:A:1244:VAL:O	2.39	0.42
1:A:1045:PRO:C	1:A:1048:PRO:HD3	2.44	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:193:PHE:O	1:A:194:PHE:C	2.62	0.42
1:A:219:LEU:O	1:A:223:PRO:HD2	2.19	0.42
1:A:1194:PRO:O	1:A:1194:PRO:HD2	2.20	0.42
1:A:996:PRO:CD	1:A:997:ASP:H	2.26	0.42
1:A:129:ALA:HB3	1:A:943:SER:HA	2.02	0.41
1:A:532:SER:CB	3:A:1304:ATP:O5'	2.68	0.41
1:A:927:PRO:HD2	1:A:928:TYR:N	2.32	0.41
1:A:1044:TYR:CB	3:A:1304:ATP:C2	3.03	0.41
1:A:518:HIS:O	1:A:519:LYS:C	2.63	0.41
1:A:725:GLN:CB	1:A:726:PRO:CD	2.98	0.41
1:A:1046:THR:C	1:A:1048:PRO:CD	2.94	0.41
1:A:199:THR:O	1:A:200:PHE:C	2.64	0.41
1:A:126:LEU:CB	1:A:947:ALA:CB	2.93	0.40
1:A:722:GLY:O	1:A:726:PRO:HD2	2.22	0.40
1:A:496:THR:O	1:A:499:GLU:N	2.53	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	1139/1280 (89%)	1091 (96%)	46 (4%)	2 (0%)	44 78

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	184	GLU
1	A	187	GLY

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	30/1064 (3%)	30 (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. There are no such sidechains identified.

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 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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	1303	2	28,33,33	0.91	2 (7%)	34,52,52	0.98	3 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	ATP	A	1304	2	28,33,33	0.78	0	34,52,52	0.84	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
3	ATP	A	1303	2	-	5/18/38/38	0/3/3/3
3	ATP	A	1304	2	-	5/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1303	ATP	PA-O3A	-2.37	1.56	1.59
3	A	1303	ATP	PB-O3B	-2.04	1.57	1.59

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1303	ATP	C5-C6-N6	2.31	123.83	120.31
3	A	1303	ATP	O3'-C3'-C2'	-2.19	104.79	111.82
3	A	1303	ATP	O2'-C2'-C3'	-2.19	104.80	111.82
3	A	1304	ATP	C5-C6-N6	2.19	123.64	120.31

There are no chirality outliers.

All (10) torsion outliers are listed below:

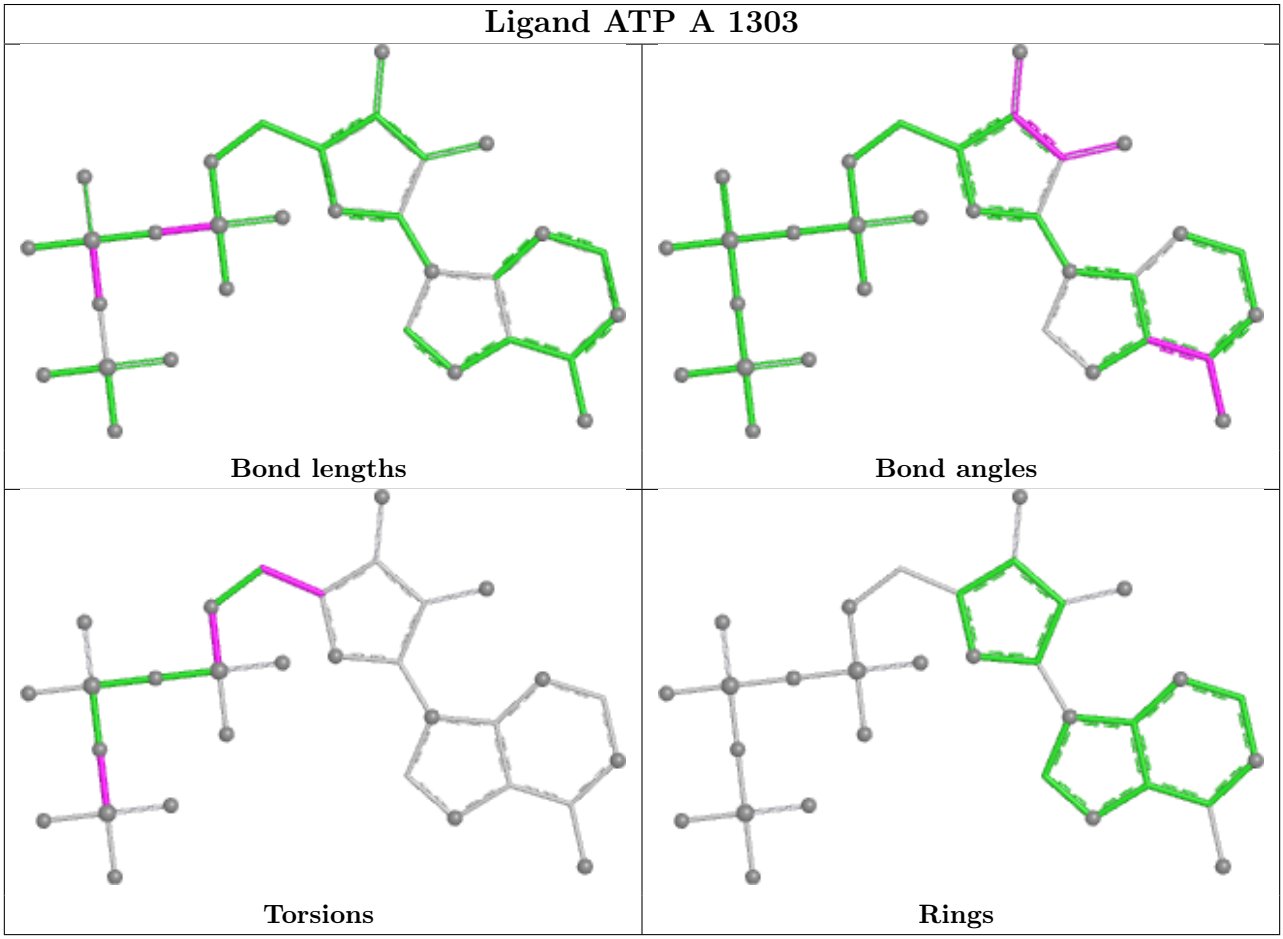
Mol	Chain	Res	Type	Atoms
3	A	1303	ATP	PB-O3B-PG-O3G
3	A	1303	ATP	C5'-O5'-PA-O1A
3	A	1303	ATP	C5'-O5'-PA-O3A
3	A	1304	ATP	PB-O3B-PG-O2G
3	A	1304	ATP	PA-O3A-PB-O3B
3	A	1303	ATP	C5'-O5'-PA-O2A
3	A	1303	ATP	O4'-C4'-C5'-O5'
3	A	1304	ATP	C3'-C4'-C5'-O5'
3	A	1304	ATP	PA-O3A-PB-O1B
3	A	1304	ATP	O4'-C4'-C5'-O5'

There are no ring outliers.

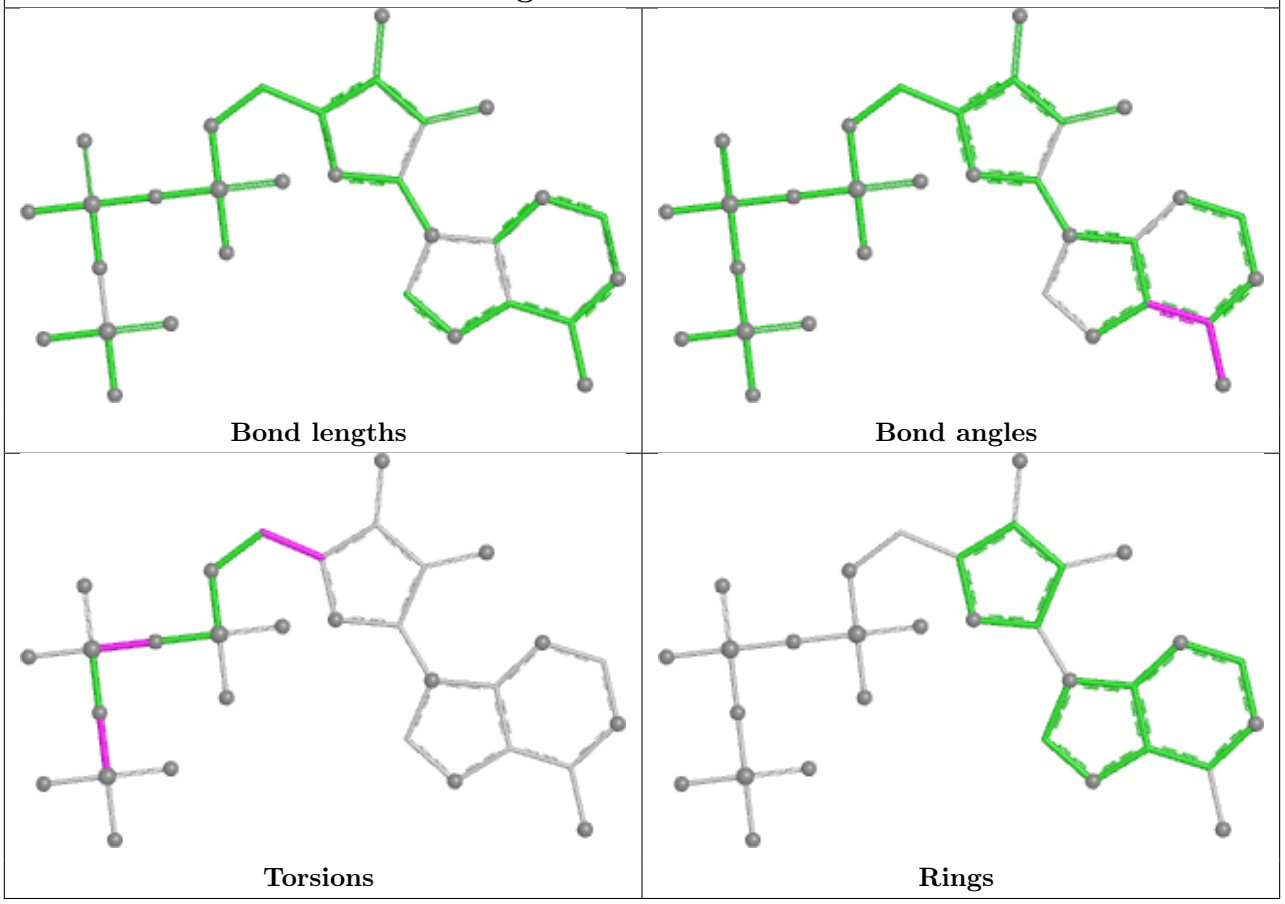
2 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1303	ATP	3	0
3	A	1304	ATP	9	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 then 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 1304



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.

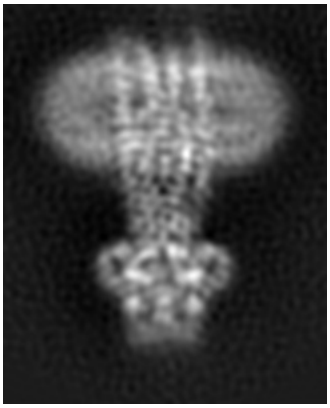
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-40227. These allow visual inspection of the internal detail of the map and identification of artifacts.

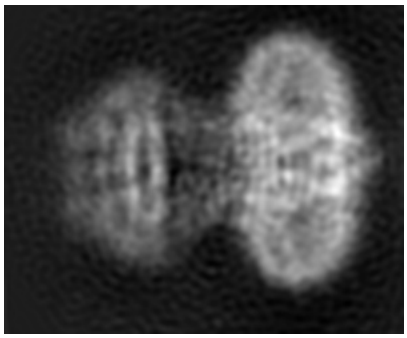
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

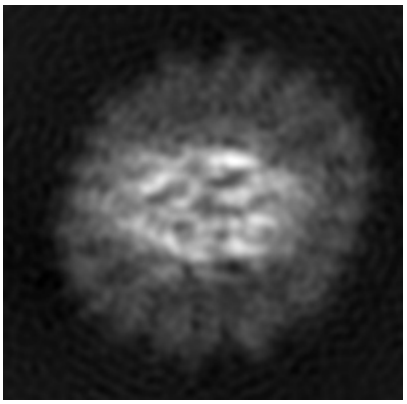
6.1.1 Primary map



X

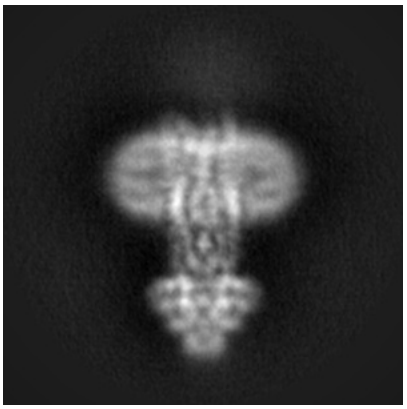


Y

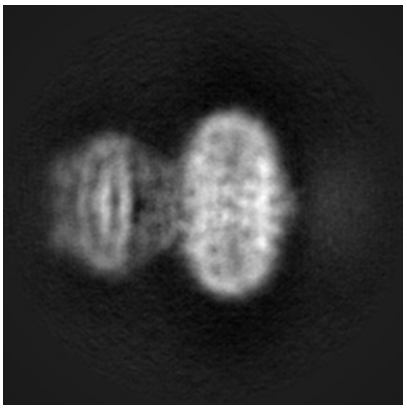


Z

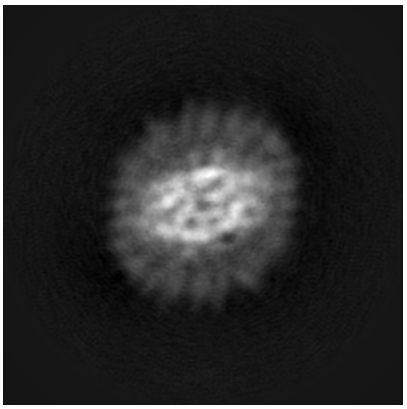
6.1.2 Raw map



X



Y

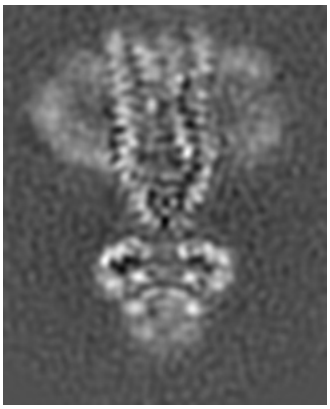


Z

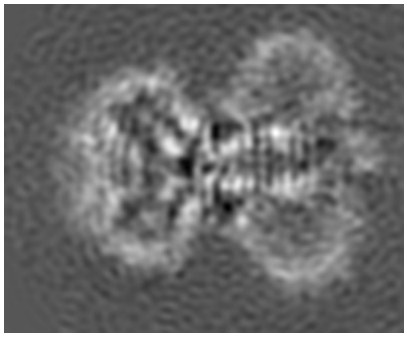
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

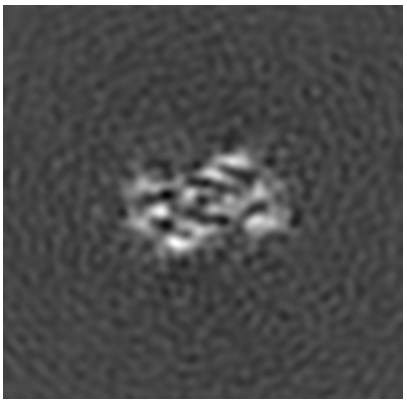
6.2.1 Primary map



X Index: 60

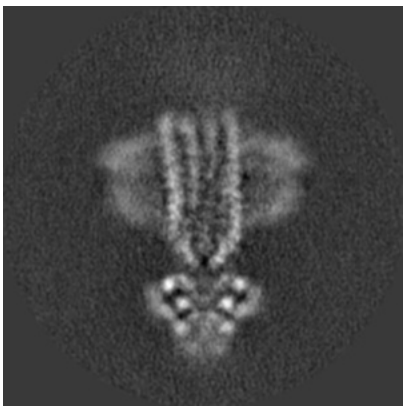


Y Index: 59

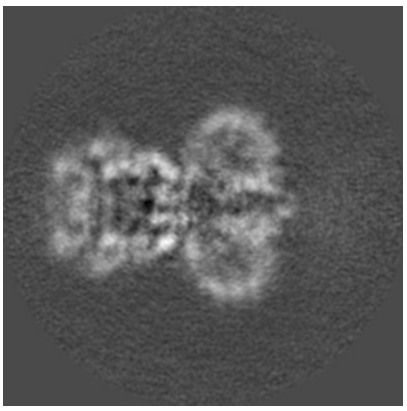


Z Index: 73

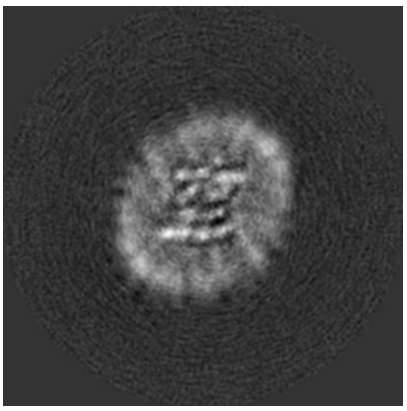
6.2.2 Raw map



X Index: 96



Y Index: 96

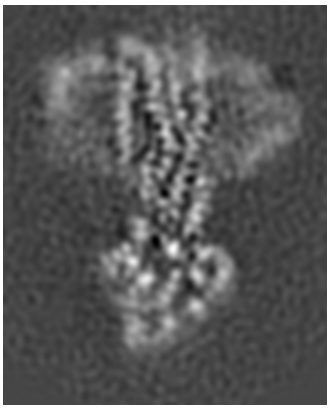


Z Index: 96

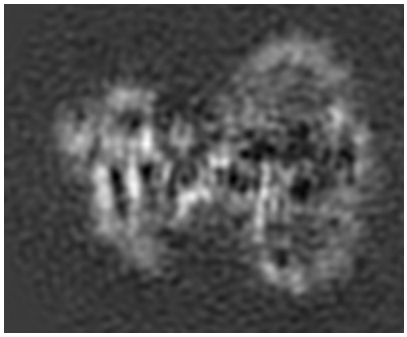
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

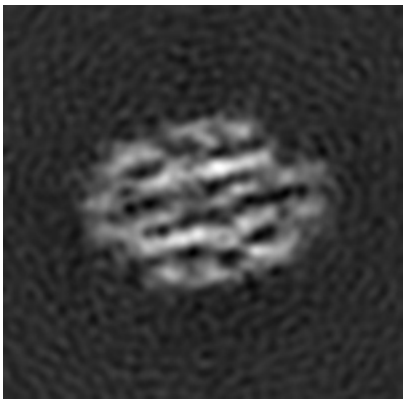
6.3.1 Primary map



X Index: 72

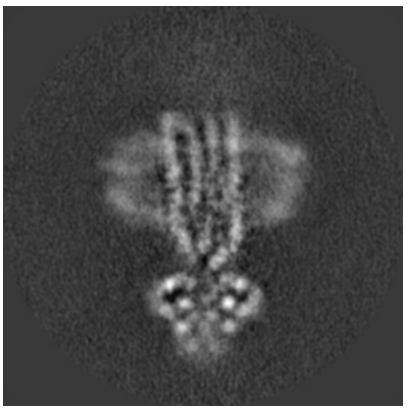


Y Index: 48

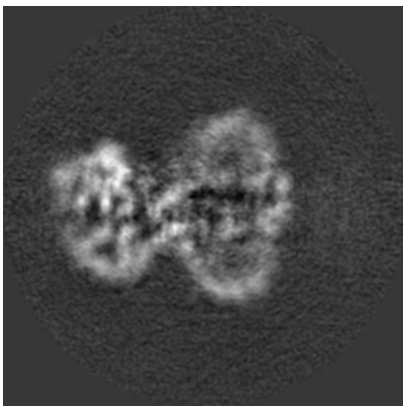


Z Index: 47

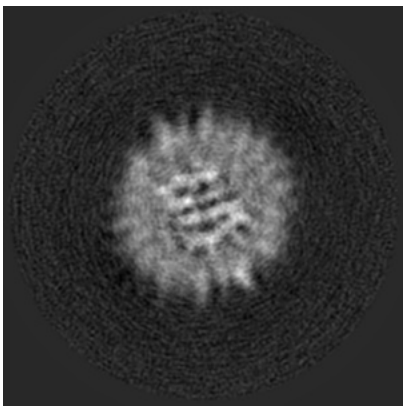
6.3.2 Raw map



X Index: 98



Y Index: 87

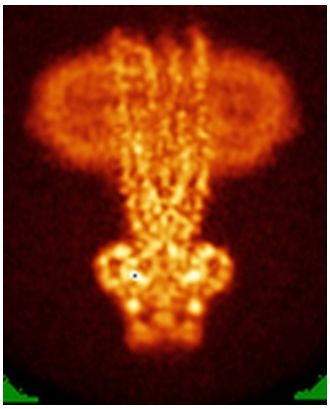


Z Index: 124

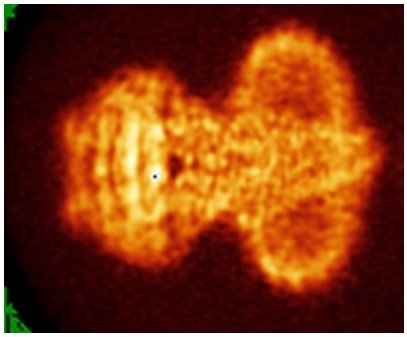
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

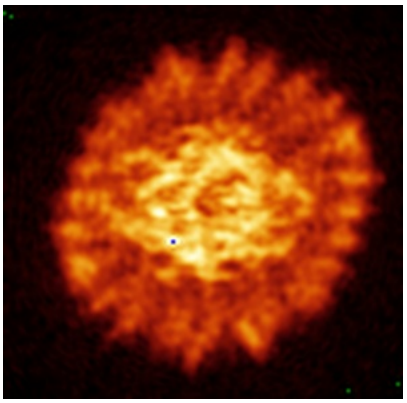
6.4.1 Primary map



X

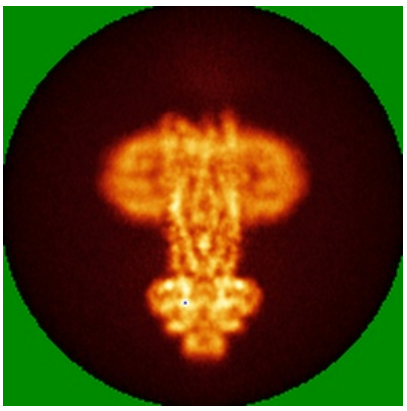


Y

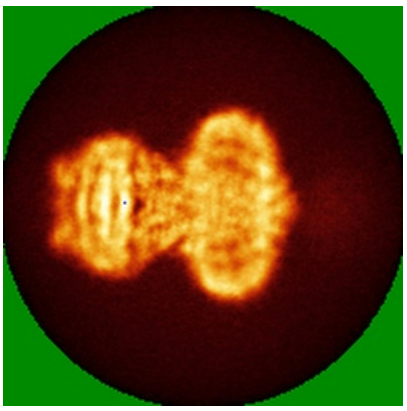


Z

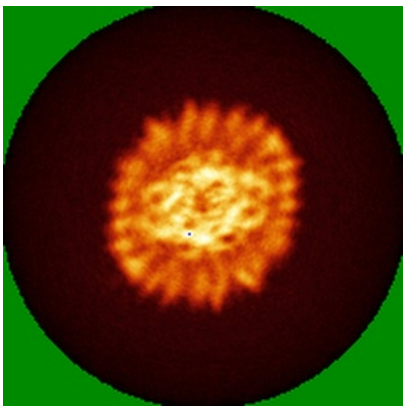
6.4.2 Raw map



X



Y

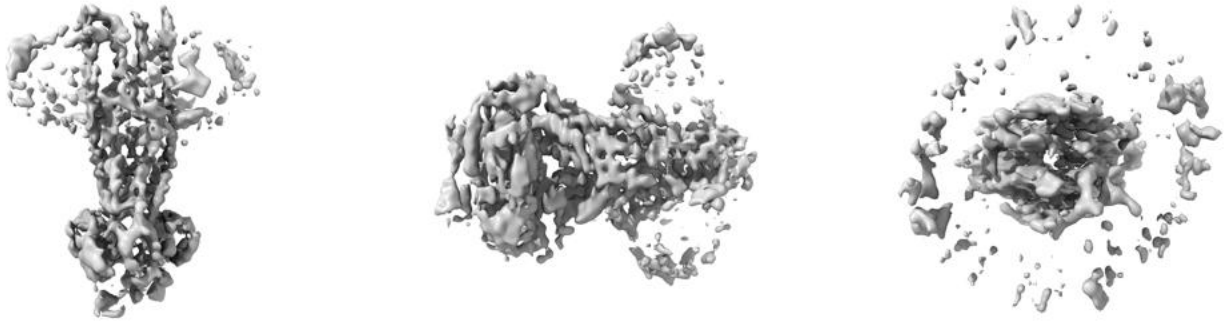


Z

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



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.049. 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

X Y Z

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.

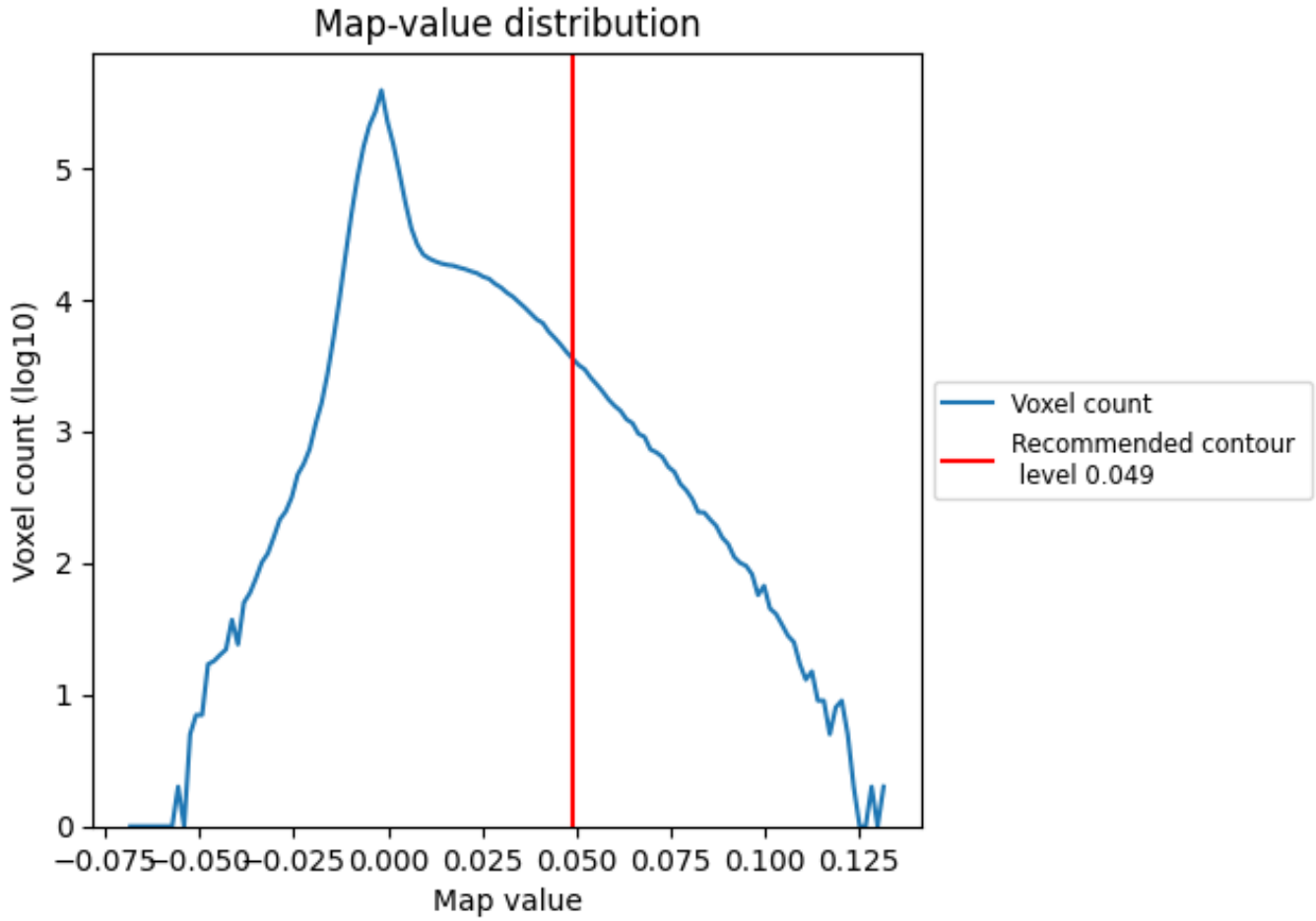
6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

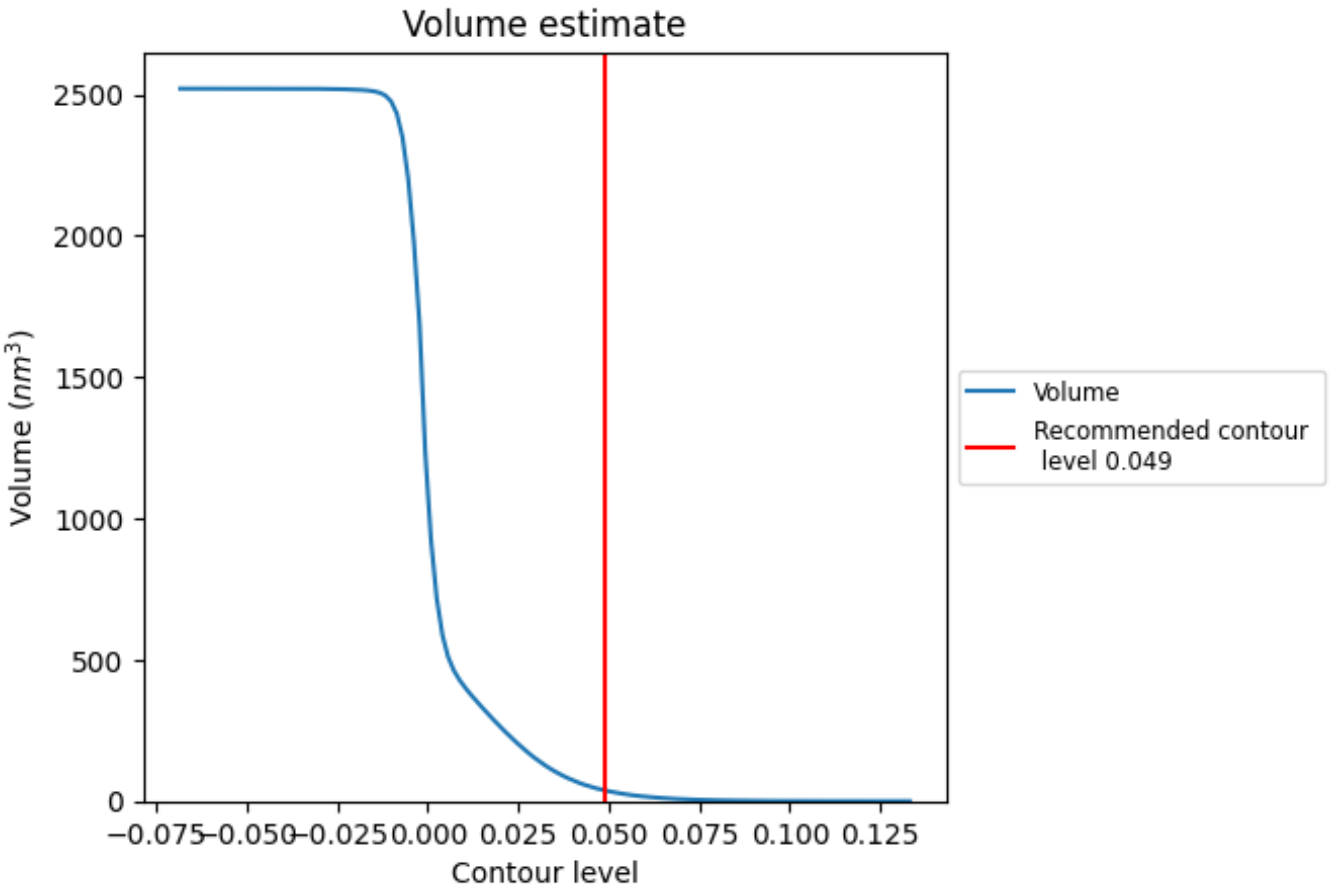
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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 38 nm^3; this corresponds to an approximate mass of 34 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.

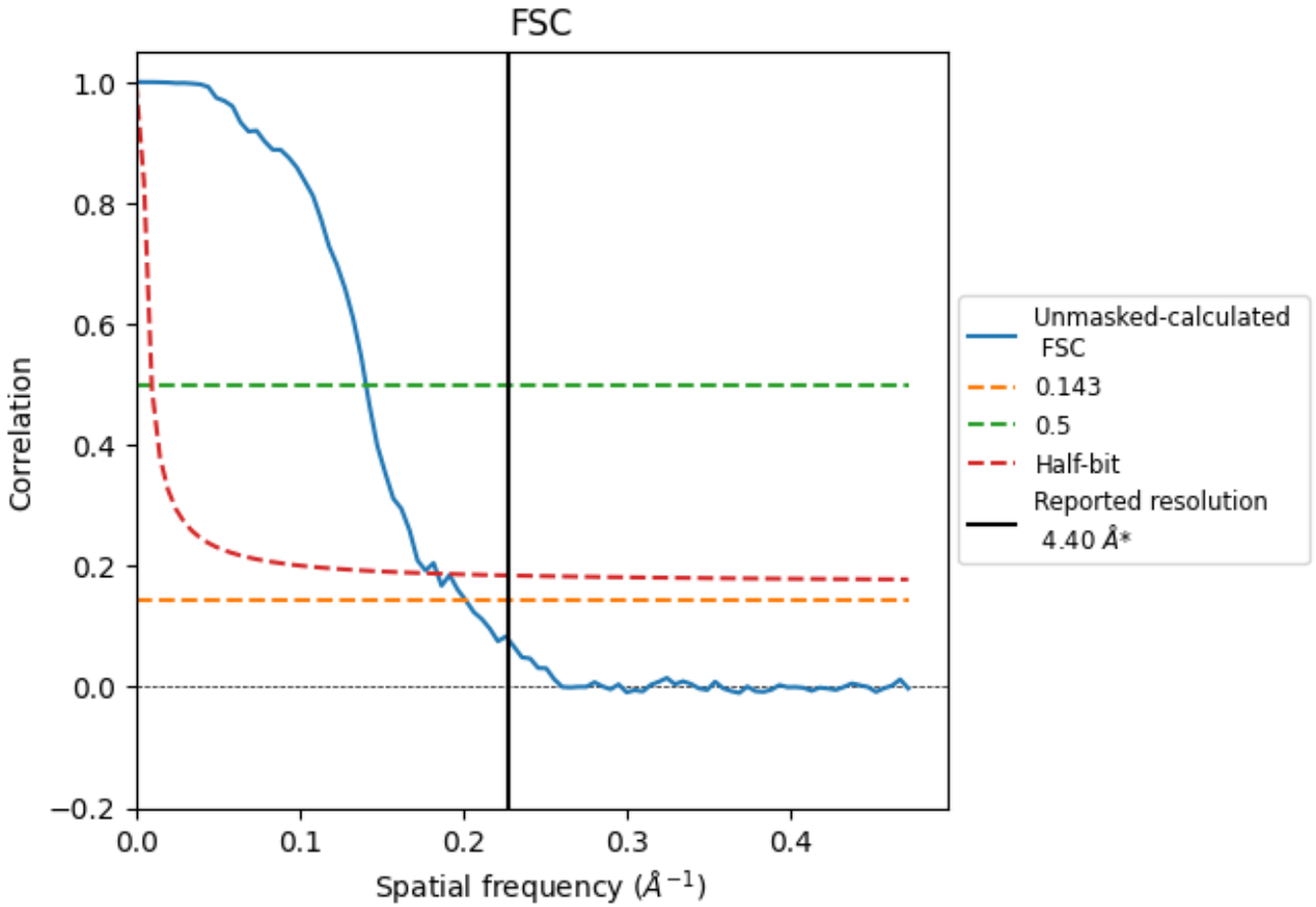
7.3 Rotationally averaged power spectrum (i)

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.227 Å^{-1}

8.2 Resolution estimates (i)

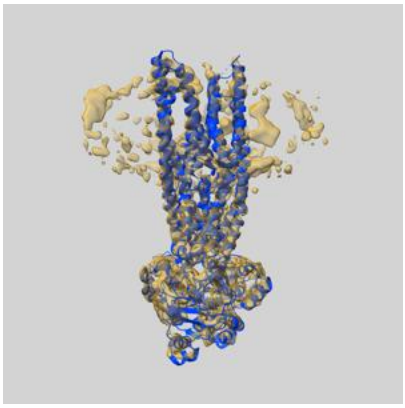
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.97	7.12	5.43

*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 4.97 differs from the reported value 4.4 by more than 10 %

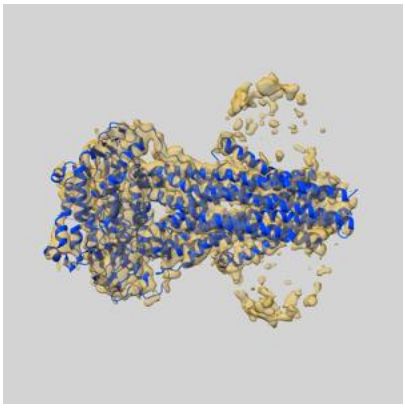
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-40227 and PDB model 8GMJ. Per-residue inclusion information can be found in section 3 on page 4.

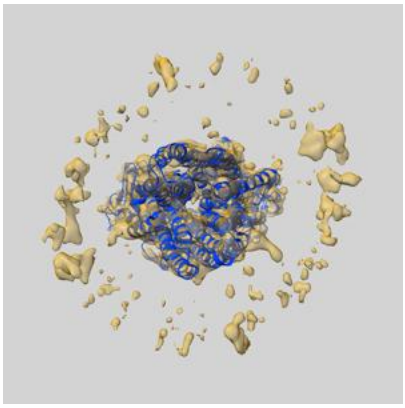
9.1 Map-model overlay



X



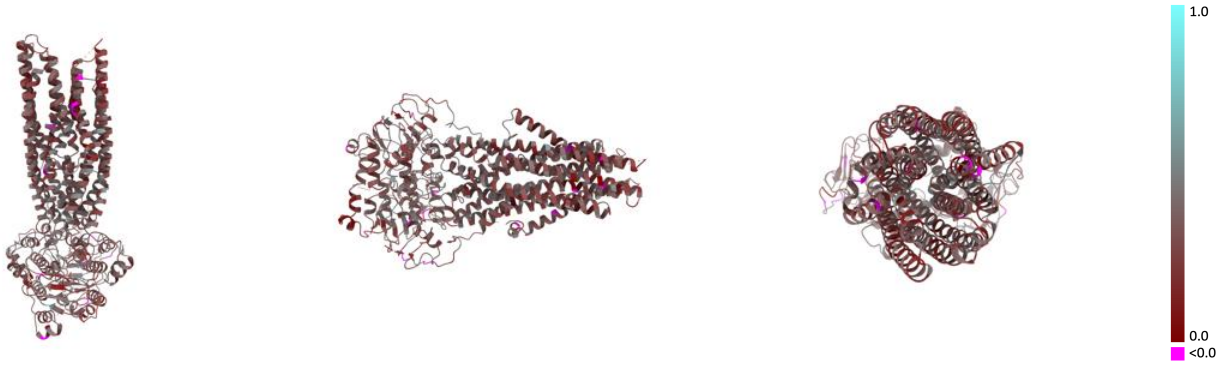
Y



Z

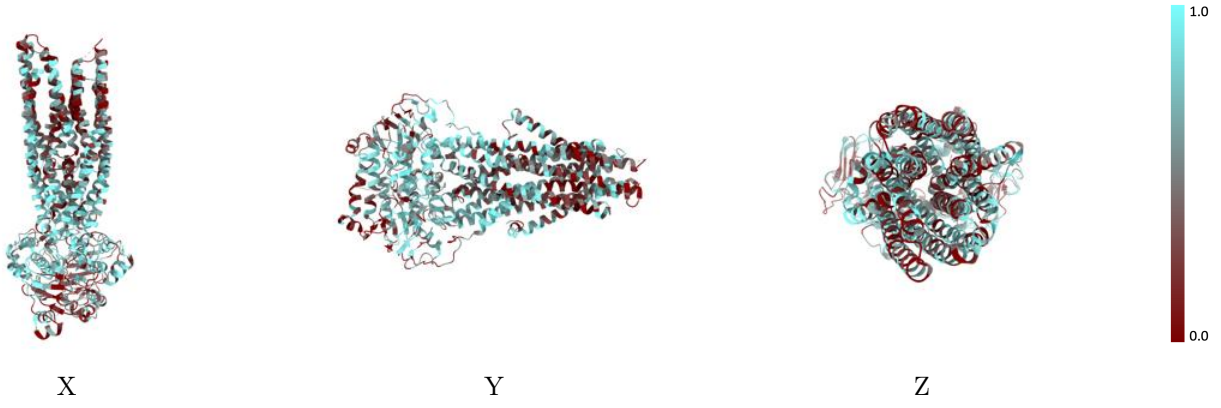
The images above show the 3D surface view of the map at the recommended contour level 0.049 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)



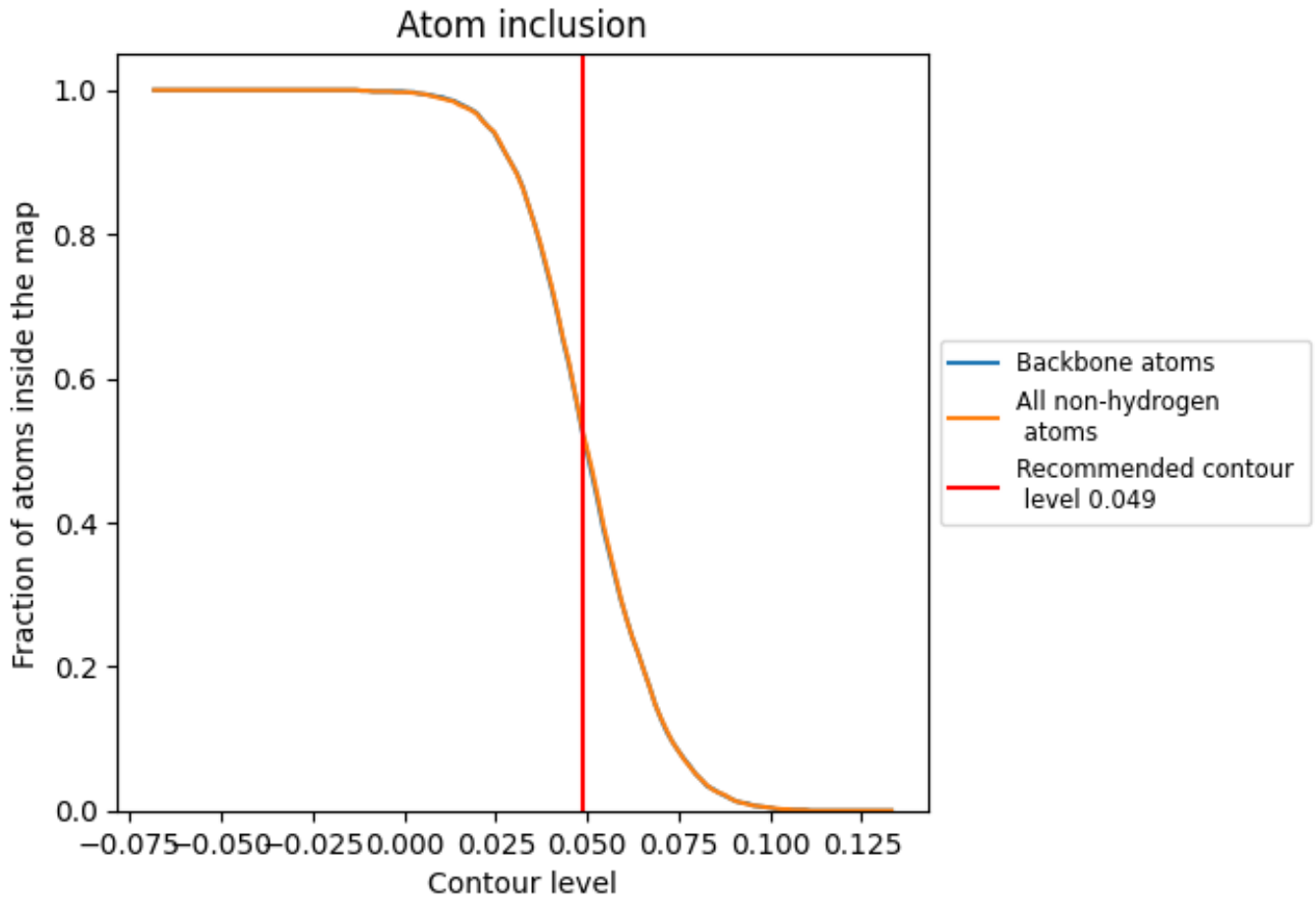
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.049).

9.4 Atom inclusion (i)



At the recommended contour level, 52% of all backbone atoms, 52% 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 (0.049) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5210	0.3180
A	0.5270	0.3180