Full wwPDB EM Validation Report

May 8, 2025 – 02:21 PM JST

PDB ID	:	9JUO / pdb_00009juo
EMDB ID	:	EMD-61832
Title	:	Structure of Arabidopsis thaliana ABCB1 with AMP-PNP bound in the inward-facing conformation under IAA condition
Authors	:	Chen, Q.; Su, N.; Guo, J.
Deposited on	:	2024-10-08
Resolution	:	3.10 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:

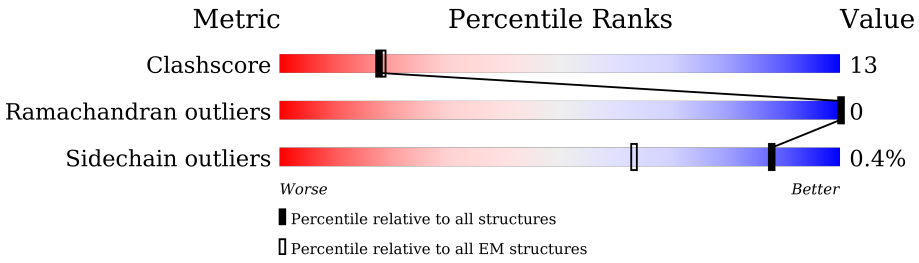
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
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 3.10 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	1327	23% 62% 24% 14%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 8858 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 ABC transporter B family member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1144	8794	5625	1506	1623	40	0	0

There are 41 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-40	MET	-	initiating methionine	UNP Q9ZR72
A	-39	ASP	-	expression tag	UNP Q9ZR72
A	-38	TYR	-	expression tag	UNP Q9ZR72
A	-37	LYS	-	expression tag	UNP Q9ZR72
A	-36	ASP	-	expression tag	UNP Q9ZR72
A	-35	ASP	-	expression tag	UNP Q9ZR72
A	-34	ASP	-	expression tag	UNP Q9ZR72
A	-33	ASP	-	expression tag	UNP Q9ZR72
A	-32	LYS	-	expression tag	UNP Q9ZR72
A	-31	TRP	-	expression tag	UNP Q9ZR72
A	-30	SER	-	expression tag	UNP Q9ZR72
A	-29	HIS	-	expression tag	UNP Q9ZR72
A	-28	PRO	-	expression tag	UNP Q9ZR72
A	-27	GLN	-	expression tag	UNP Q9ZR72
A	-26	PHE	-	expression tag	UNP Q9ZR72
A	-25	GLU	-	expression tag	UNP Q9ZR72
A	-24	LYS	-	expression tag	UNP Q9ZR72
A	-23	GLY	-	expression tag	UNP Q9ZR72
A	-22	GLY	-	expression tag	UNP Q9ZR72
A	-21	GLY	-	expression tag	UNP Q9ZR72
A	-20	GLY	-	expression tag	UNP Q9ZR72
A	-19	SER	-	expression tag	UNP Q9ZR72
A	-18	GLY	-	expression tag	UNP Q9ZR72
A	-17	GLY	-	expression tag	UNP Q9ZR72
A	-16	SER	-	expression tag	UNP Q9ZR72
A	-15	ALA	-	expression tag	UNP Q9ZR72
A	-14	TRP	-	expression tag	UNP Q9ZR72
A	-13	SER	-	expression tag	UNP Q9ZR72

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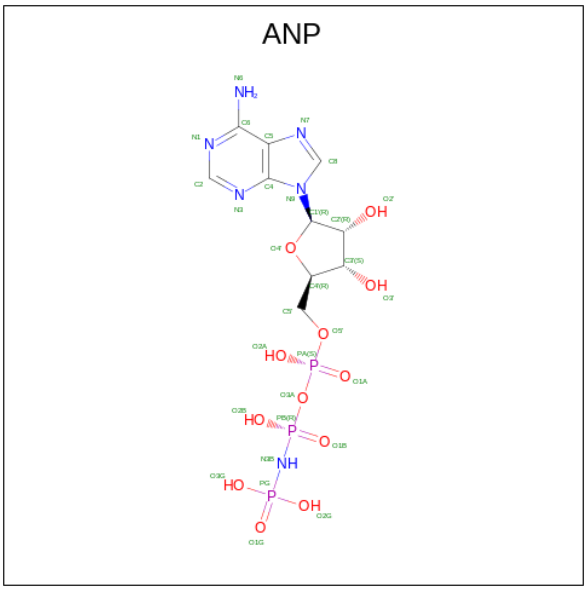
Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	HIS	-	expression tag	UNP Q9ZR72
A	-11	PRO	-	expression tag	UNP Q9ZR72
A	-10	GLN	-	expression tag	UNP Q9ZR72
A	-9	PHE	-	expression tag	UNP Q9ZR72
A	-8	GLU	-	expression tag	UNP Q9ZR72
A	-7	LYS	-	expression tag	UNP Q9ZR72
A	-6	GLU	-	expression tag	UNP Q9ZR72
A	-5	PHE	-	expression tag	UNP Q9ZR72
A	-4	LYS	-	expression tag	UNP Q9ZR72
A	-3	GLY	-	expression tag	UNP Q9ZR72
A	-2	LEU	-	expression tag	UNP Q9ZR72
A	-1	VAL	-	expression tag	UNP Q9ZR72
A	0	ASP	-	expression tag	UNP Q9ZR72

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (CCD ID: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	6	12	3	

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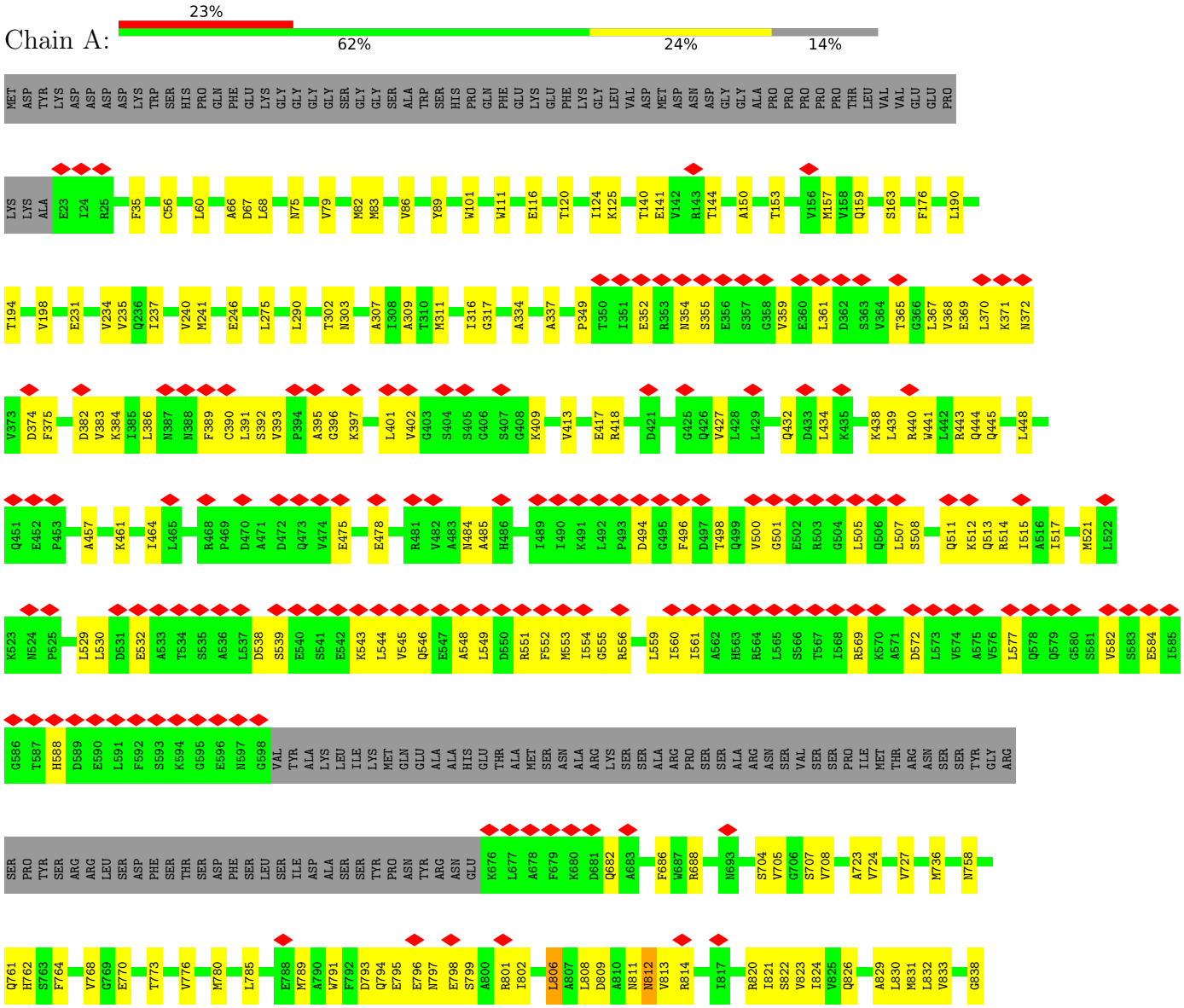
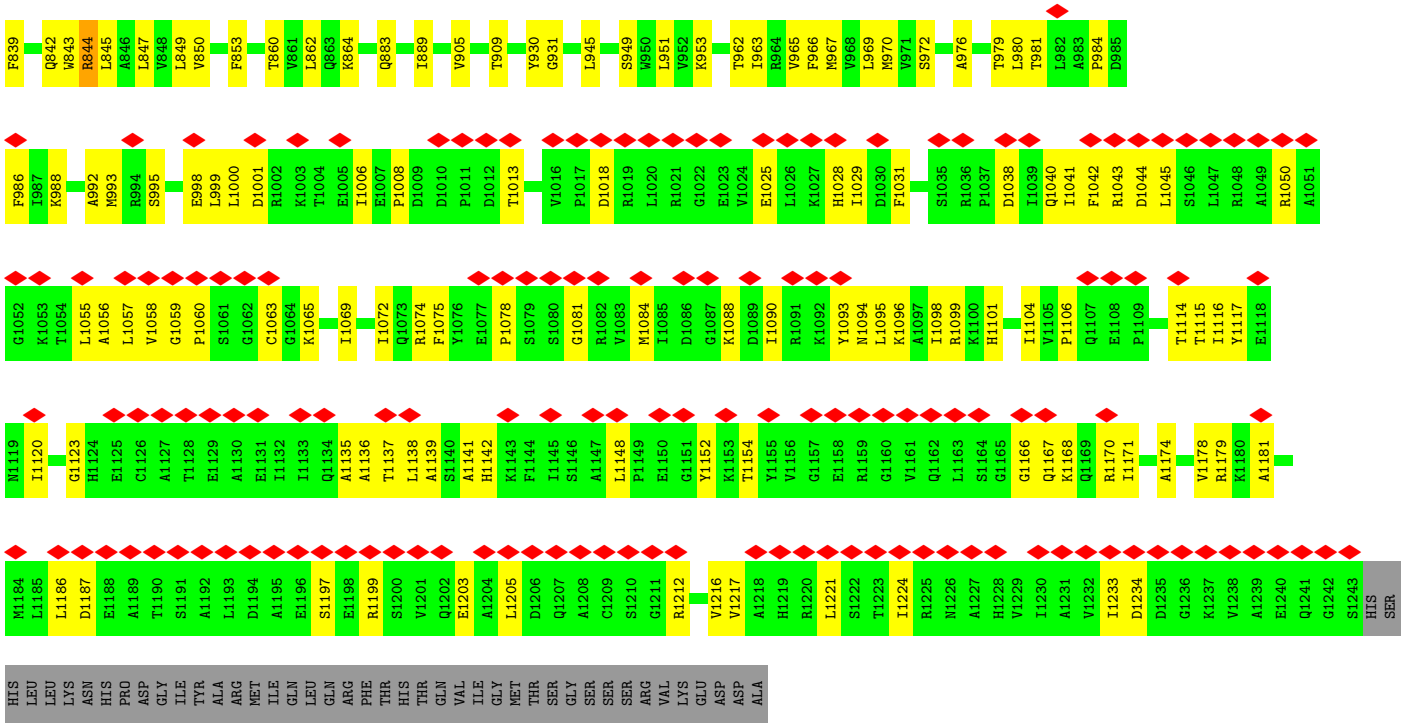
Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	6	12	3	

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: ABC transporter B family member 1




F839 Q842 W843 R844 L845 A846 L847 V848 L849 V850 F853 T860 V861 L862 Q863 K864 Q883 I889 V905 T909 Y930 G931 L945 S949 W950 L951 V952 K953 T962 I963 R964 V965 F966 M967 V968 L969 M970 V971 S972 A976 T979 L980 T981 L982 A983 P984 D985
F986 I987 K988 A992 M993 R994 S995 E998 L999 L1000 D1001 R1002 K1003 T1004 E1005 I1006 E1007 P1008 D1009 D1010 P1011 D1012 T1013 V1016 P1017 D1018 R1019 L1020 R1021 G1022 E1023 V1024 E1025 L1026 K1027 H1028 I1029 D1030 F1031 S1035 R1036 P1037 D1038 I1039 Q1040 I1041 F1042 R1043 D1044 L1045 S1046 L1047 R1048 A1049 R1050 A1051
G1052 K1053 T1054 L1055 A1056 L1057 V1058 G1059 P1060 S1061 G1062 C1063 G1064 K1065 I1069 I1072 Q1073 R1074 F1075 Y1076 E1077 P1078 S1079 S1080 G1081 R1082 V1083 M1084 I1085 D1086 G1087 K1088 D1089 I1090 R1091 K1092 Y1093 N1094 L1095 K1096 A1097 I1098 R1099 K1100 H1101 I1104 V1105 P1106 Q1107 E1108 P1109 T1114 T1115 I1116 Y1117 E1118
N1119 I1120 G1123 H1124 E1125 C1126 A1127 T1128 E1129 A1130 E1131 I1132 I1133 Q1134 A1135 A1136 T1137 L1138 A1139 S1140 A1141 H1142 K1143 F1144 I1145 S1146 A1147 L1148 P1149 E1150 G1151 Y1152 K1153 T1154 Y1155 V1156 G1157 E1158 R1159 G1160 V1161 Q1162 L1163 S1164 G1165 G1166 Q1167 K1168 Q1169 R1170 I1171 A1174 V1178 R1179 K1180 A1181
M1184 L1185 L1186 D1187 E1188 A1189 T1190 S1191 A1192 L1193 D1194 A1195 E1196 S1197 E1198 R1199 S1200 V1201 Q1202 E1203 A1204 L1205 D1206 Q1207 A1208 C1209 S1210 G1211 R1212 V1216 V1217 A1218 H1219 R1220 L1221 S1222 T1223 I1224 R1225 N1226 A1227 H1228 V1229 I1230 A1231 V1232 I1233 D1234 D1235 G1236 K1237 V1238 A1239 E1240 Q1241 G1242 S1243 HIS SER
HIS LEU LEU LYS ASN HIS PRO ASP GLY ILE TYR ALA ARG MET ILE GLN LEU GLN ARG PHE THR HIS THR GLN VAL ILE GLY MET THR SER GLY SER SER SER ARG VAL LYS GLU ASP ASP ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	157897	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)	800	Depositor
Maximum defocus (nm)	1400	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.082	Depositor
Minimum map value	-0.040	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.014	Depositor
Map size (Å)	223.2, 223.2, 223.2	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.93, 0.93, 0.93	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ANP, 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	0.30	0/8955	0.45	0/12121

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	8794	0	8936	235	0
2	A	2	0	0	0	0
3	A	62	0	26	0	0
All	All	8858	0	8962	235	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 13.

All (235) 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:770:GLU:HG2	1:A:814:ARG:HH21	1.35	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:727:VAL:HG12	1:A:736:MET:HG3	1.62	0.80
1:A:1095:LEU:HD21	1:A:1099:ARG:HH11	1.46	0.79
1:A:780:MET:HE2	1:A:806:LEU:HD22	1.65	0.78
1:A:549:LEU:HB3	1:A:552:PHE:HB3	1.65	0.77
1:A:157:MET:HG2	1:A:334:ALA:HA	1.67	0.77
1:A:375:PHE:H	1:A:386:LEU:HB3	1.50	0.77
1:A:389:PHE:HB2	1:A:582:VAL:HG22	1.67	0.76
1:A:844:ARG:HD2	1:A:951:LEU:HD21	1.65	0.75
1:A:1093:TYR:CE2	1:A:1098:ILE:HG13	2.23	0.73
1:A:809:ASP:O	1:A:813:VAL:HG12	1.88	0.72
1:A:789:MET:HG3	1:A:1075:PHE:CD2	2.25	0.72
1:A:549:LEU:HD12	1:A:553:MET:HE3	1.73	0.71
1:A:821:ILE:O	1:A:824:ILE:HG22	1.92	0.69
1:A:812:ASN:HD22	1:A:813:VAL:N	1.91	0.68
1:A:795:GLU:O	1:A:798:GLU:HG3	1.95	0.67
1:A:839:PHE:HD2	1:A:843:TRP:HD1	1.41	0.66
1:A:776:VAL:O	1:A:780:MET:HG3	1.97	0.65
1:A:413:VAL:HG13	1:A:529:LEU:HD23	1.80	0.64
1:A:809:ASP:HA	1:A:812:ASN:HD21	1.62	0.63
1:A:75:ASN:HB2	1:A:82:MET:HB3	1.79	0.63
1:A:773:THR:HB	1:A:814:ARG:HB2	1.81	0.63
1:A:838:GLY:HA2	1:A:965:VAL:HG22	1.80	0.63
1:A:1136:ALA:HB1	1:A:1141:ALA:HB3	1.80	0.63
1:A:584:GLU:OE2	1:A:588:HIS:NE2	2.32	0.63
1:A:1013:THR:HG21	1:A:1094:ASN:HB2	1.81	0.63
1:A:511:GLN:O	1:A:514:ARG:HB2	1.99	0.63
1:A:1008:PRO:HB2	1:A:1096:LYS:HE3	1.79	0.63
1:A:1136:ALA:HA	1:A:1139:ALA:HB3	1.80	0.61
1:A:409:LYS:HB3	1:A:559:LEU:HD11	1.82	0.61
1:A:1104:ILE:HG22	1:A:1106:PRO:HD3	1.81	0.61
1:A:966:PHE:O	1:A:970:MET:HG2	2.00	0.61
1:A:1120:ILE:HG22	1:A:1178:VAL:HG21	1.82	0.61
1:A:441:TRP:O	1:A:445:GLN:NE2	2.34	0.61
1:A:546:GLN:HA	1:A:551:ARG:HH12	1.66	0.61
1:A:1137:THR:HA	1:A:1142:HIS:HB2	1.82	0.61
1:A:569:ARG:NH2	1:A:588:HIS:O	2.34	0.61
1:A:349:PRO:HG2	1:A:352:GLU:HB2	1.82	0.60
1:A:1029:ILE:HD11	1:A:1045:LEU:HD23	1.83	0.60
1:A:820:ARG:HB3	1:A:986:PHE:CE1	2.36	0.60
1:A:1181:ALA:O	1:A:1212:ARG:NH1	2.35	0.58
1:A:241:MET:HB3	1:A:1099:ARG:HH22	1.67	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:66:ALA:HB2	1:A:309:ALA:HB2	1.85	0.57
1:A:1186:LEU:HD11	1:A:1205:LEU:HD22	1.86	0.57
1:A:140:THR:OG1	1:A:141:GLU:OE2	2.16	0.57
1:A:545:VAL:O	1:A:551:ARG:NH1	2.38	0.57
1:A:68:LEU:HD22	1:A:945:LEU:HD13	1.86	0.56
1:A:812:ASN:HD22	1:A:813:VAL:H	1.52	0.56
1:A:484:ASN:OD1	1:A:514:ARG:NH1	2.38	0.56
1:A:823:VAL:O	1:A:826:GLN:HG2	2.04	0.56
1:A:773:THR:CB	1:A:814:ARG:HB2	2.36	0.56
1:A:780:MET:HG2	1:A:1000:LEU:HD11	1.88	0.56
1:A:845:LEU:HD22	1:A:962:THR:HG22	1.89	0.55
1:A:1114:THR:HG23	1:A:1115:THR:HG23	1.88	0.55
1:A:688:ARG:NH2	1:A:1001:ASP:OD2	2.35	0.55
1:A:396:GLY:HA2	1:A:554:ILE:HA	1.87	0.55
1:A:1187:ASP:HA	1:A:1217:VAL:HG22	1.88	0.55
1:A:427:VAL:HG13	1:A:434:LEU:HD12	1.89	0.55
1:A:798:GLU:HB2	1:A:801:ARG:HB3	1.87	0.55
1:A:355:SER:OG	1:A:440:ARG:NH2	2.40	0.55
1:A:995:SER:O	1:A:998:GLU:HG3	2.07	0.54
1:A:116:GLU:HA	1:A:159:GLN:HE22	1.73	0.54
1:A:144:THR:HG23	1:A:889:ILE:HG22	1.89	0.54
1:A:773:THR:HB	1:A:814:ARG:HG3	1.89	0.54
1:A:485:ALA:HB3	1:A:514:ARG:HH12	1.72	0.54
1:A:439:LEU:HD11	1:A:443:ARG:HH21	1.72	0.54
1:A:290:LEU:HD23	1:A:311:MET:HE1	1.89	0.54
1:A:797:ASN:HB3	1:A:802:ILE:HD11	1.88	0.54
1:A:111:TRP:HB3	1:A:163:SER:O	2.07	0.53
1:A:795:GLU:CD	1:A:801:ARG:HH22	2.17	0.53
1:A:843:TRP:CG	1:A:844:ARG:N	2.76	0.53
1:A:237:ILE:HG23	1:A:789:MET:HE1	1.90	0.53
1:A:83:MET:HG3	1:A:953:LYS:HD3	1.91	0.52
1:A:704:SER:O	1:A:707:SER:HB3	2.09	0.52
1:A:290:LEU:HD13	1:A:724:VAL:HG21	1.90	0.52
1:A:237:ILE:HA	1:A:240:VAL:HB	1.91	0.52
1:A:780:MET:HE3	1:A:999:LEU:HD23	1.92	0.52
1:A:1116:ILE:O	1:A:1120:ILE:HG12	2.10	0.52
1:A:1186:LEU:HB2	1:A:1216:VAL:HA	1.92	0.52
1:A:1069:ILE:HA	1:A:1072:ILE:HG22	1.91	0.51
1:A:157:MET:HG3	1:A:337:ALA:HB3	1.92	0.51
1:A:354:ASN:HB3	1:A:418:ARG:HH21	1.74	0.51
1:A:35:PHE:HE1	1:A:125:LYS:HD2	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:370:LEU:HD22	1:A:391:LEU:HD23	1.92	0.51
1:A:1028:HIS:ND1	1:A:1044:ASP:OD1	2.44	0.51
1:A:1074:ARG:NH1	1:A:1090:ILE:O	2.43	0.51
1:A:794:GLN:HB3	1:A:796:GLU:CD	2.36	0.51
1:A:843:TRP:O	1:A:844:ARG:HB3	2.11	0.51
1:A:382:ASP:OD1	1:A:383:VAL:N	2.44	0.51
1:A:1117:TYR:HB2	1:A:1152:TYR:HB3	1.93	0.51
1:A:190:LEU:HD21	1:A:311:MET:HE2	1.93	0.50
1:A:234:VAL:HG11	1:A:799:SER:HA	1.92	0.50
1:A:371:LYS:HG2	1:A:372:ASN:H	1.76	0.50
1:A:1093:TYR:HD2	1:A:1095:LEU:H	1.57	0.50
1:A:402:VAL:HG13	1:A:561:ILE:HD12	1.93	0.50
1:A:370:LEU:HA	1:A:427:VAL:HG23	1.94	0.50
1:A:705:VAL:O	1:A:708:VAL:HG22	2.12	0.50
1:A:773:THR:HG21	1:A:814:ARG:HD2	1.95	0.49
1:A:35:PHE:CE1	1:A:125:LYS:HD2	2.47	0.49
1:A:1166:GLY:O	1:A:1170:ARG:HG2	2.12	0.49
1:A:1168:LYS:HA	1:A:1171:ILE:HD12	1.93	0.49
1:A:417:GLU:OE2	1:A:448:LEU:HB2	2.12	0.49
1:A:849:LEU:HD23	1:A:969:LEU:HB2	1.95	0.49
1:A:79:VAL:HA	1:A:82:MET:HG2	1.95	0.48
1:A:532:GLU:HA	1:A:560:ILE:HG12	1.95	0.48
1:A:1058:VAL:HG13	1:A:1059:GLY:N	2.28	0.48
1:A:120:THR:O	1:A:124:ILE:HG12	2.14	0.48
1:A:302:THR:OG1	1:A:303:ASN:N	2.47	0.48
1:A:500:VAL:HA	1:A:505:LEU:HB2	1.95	0.47
1:A:862:LEU:HD23	1:A:930:TYR:HA	1.96	0.47
1:A:847:LEU:HA	1:A:850:VAL:HG22	1.95	0.47
1:A:475:GLU:O	1:A:478:GLU:HG2	2.14	0.47
1:A:150:ALA:HA	1:A:153:THR:HG22	1.96	0.47
1:A:842:GLN:HB3	1:A:965:VAL:HG21	1.97	0.47
1:A:1031:PHE:HB3	1:A:1078:PRO:HA	1.96	0.47
1:A:538:ASP:O	1:A:543:LYS:NZ	2.42	0.47
1:A:1025:GLU:HB2	1:A:1084:MET:HB3	1.95	0.47
1:A:1055:LEU:HD23	1:A:1057:LEU:H	1.79	0.47
1:A:839:PHE:HD2	1:A:843:TRP:CD1	2.29	0.47
1:A:844:ARG:HB3	1:A:844:ARG:CZ	2.43	0.47
1:A:761:GLN:HE22	1:A:826:GLN:HE22	1.62	0.47
1:A:831:MET:CE	1:A:976:ALA:HB2	2.45	0.47
1:A:845:LEU:O	1:A:849:LEU:HD13	2.15	0.47
1:A:1095:LEU:HD21	1:A:1099:ARG:NH1	2.25	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:GLU:HB2	1:A:785:LEU:HD13	1.97	0.46
1:A:397:LYS:HE3	1:A:572:ASP:HB3	1.97	0.46
1:A:401:LEU:HD12	1:A:577:LEU:HD22	1.97	0.46
1:A:234:VAL:CG1	1:A:799:SER:HA	2.45	0.46
1:A:461:LYS:HE2	1:A:496:PHE:O	2.15	0.46
1:A:1018:ASP:N	1:A:1018:ASP:OD1	2.48	0.46
1:A:831:MET:HE1	1:A:853:PHE:CZ	2.51	0.46
1:A:829:ALA:O	1:A:833:VAL:HG22	2.16	0.46
1:A:1136:ALA:HB2	1:A:1174:ALA:HB2	1.97	0.46
1:A:808:LEU:HA	1:A:811:ASN:HD21	1.81	0.46
1:A:530:LEU:HD21	1:A:544:LEU:HD21	1.96	0.46
1:A:796:GLU:HA	1:A:801:ARG:CZ	2.46	0.46
1:A:905:VAL:O	1:A:909:THR:HG23	2.16	0.46
1:A:1234:ASP:N	1:A:1234:ASP:OD1	2.46	0.46
1:A:831:MET:HE1	1:A:976:ALA:HB2	1.97	0.46
1:A:1123:GLY:O	1:A:1179:ARG:NE	2.41	0.46
1:A:375:PHE:N	1:A:386:LEU:HB3	2.26	0.45
1:A:1058:VAL:HG13	1:A:1059:GLY:H	1.81	0.45
1:A:761:GLN:HG3	1:A:762:HIS:N	2.30	0.45
1:A:401:LEU:H	1:A:401:LEU:HD23	1.81	0.45
1:A:409:LYS:HE2	1:A:559:LEU:HD21	1.99	0.45
1:A:988:LYS:HB3	1:A:988:LYS:HE2	1.69	0.45
1:A:359:VAL:HG12	1:A:359:VAL:O	2.16	0.45
1:A:521:MET:SD	1:A:548:ALA:HA	2.57	0.45
1:A:981:THR:O	1:A:984:PRO:HD2	2.17	0.45
1:A:1006:ILE:HG23	1:A:1074:ARG:HH21	1.81	0.45
1:A:1098:ILE:O	1:A:1101:HIS:N	2.38	0.45
1:A:1170:ARG:HH12	1:A:1197:SER:HB2	1.80	0.45
1:A:307:ALA:O	1:A:311:MET:HG3	2.16	0.45
1:A:812:ASN:HD21	1:A:992:ALA:HB1	1.82	0.45
1:A:963:ILE:O	1:A:967:MET:HG2	2.16	0.45
1:A:1135:ALA:O	1:A:1138:LEU:N	2.37	0.45
1:A:368:VAL:O	1:A:393:VAL:N	2.50	0.44
1:A:1167:GLN:O	1:A:1171:ILE:HG13	2.17	0.44
1:A:508:SER:HB3	1:A:511:GLN:HB2	1.99	0.44
1:A:758:ASN:HA	1:A:761:GLN:HG2	1.99	0.44
1:A:723:ALA:O	1:A:727:VAL:HG23	2.17	0.44
1:A:791:TRP:O	1:A:797:ASN:ND2	2.50	0.44
1:A:231:GLU:O	1:A:235:VAL:HG23	2.17	0.44
1:A:367:LEU:HB2	1:A:395:ALA:HB2	1.99	0.44
1:A:82:MET:HG3	1:A:83:MET:N	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1025:GLU:OE2	1:A:1050:ARG:NH2	2.50	0.44
1:A:513:GLN:O	1:A:517:ILE:HG12	2.17	0.44
1:A:832:LEU:C	1:A:832:LEU:HD23	2.42	0.44
1:A:67:ASP:HB3	1:A:89:TYR:CZ	2.53	0.44
1:A:241:MET:HB3	1:A:1099:ARG:NH2	2.31	0.44
1:A:860:THR:O	1:A:864:LYS:HG2	2.17	0.43
1:A:374:ASP:OD2	1:A:384:LYS:NZ	2.41	0.43
1:A:821:ILE:O	1:A:822:SER:C	2.61	0.43
1:A:1029:ILE:HG12	1:A:1045:LEU:HB3	1.99	0.43
1:A:494:ASP:HB2	1:A:498:THR:HG23	1.99	0.43
1:A:824:ILE:HG13	1:A:979:THR:HG23	1.99	0.43
1:A:1065:LYS:H	1:A:1233:ILE:HD11	1.83	0.43
1:A:1116:ILE:HD13	1:A:1154:THR:HB	2.01	0.43
1:A:374:ASP:HA	1:A:386:LEU:HD23	2.01	0.43
1:A:507:LEU:HD12	1:A:512:LYS:HD3	2.01	0.43
1:A:554:ILE:O	1:A:554:ILE:HG13	2.19	0.43
1:A:773:THR:HB	1:A:814:ARG:CG	2.48	0.43
1:A:86:VAL:HG11	1:A:949:SER:HB3	2.01	0.43
1:A:176:PHE:HA	1:A:317:GLY:HA2	2.01	0.43
1:A:457:ALA:HB1	1:A:883:GLN:HE22	1.83	0.43
1:A:780:MET:HE2	1:A:806:LEU:CD2	2.41	0.43
1:A:820:ARG:HB3	1:A:986:PHE:HE1	1.80	0.43
1:A:1028:HIS:N	1:A:1045:LEU:O	2.51	0.43
1:A:464:ILE:HD11	1:A:515:ILE:HG23	2.01	0.42
1:A:773:THR:HB	1:A:814:ARG:CB	2.46	0.42
1:A:793:ASP:O	1:A:794:GLN:C	2.62	0.42
1:A:1148:LEU:HD13	1:A:1154:THR:HG21	2.00	0.42
1:A:812:ASN:ND2	1:A:992:ALA:CB	2.82	0.42
1:A:1041:ILE:O	1:A:1042:PHE:HB2	2.18	0.42
1:A:361:LEU:HD21	1:A:432:GLN:HG3	2.02	0.42
1:A:409:LYS:HG2	1:A:577:LEU:HD23	2.01	0.42
1:A:820:ARG:CB	1:A:986:PHE:CE1	3.03	0.42
1:A:316:ILE:HD13	1:A:316:ILE:HA	1.92	0.42
1:A:553:MET:C	1:A:556:ARG:HH12	2.28	0.42
1:A:194:THR:O	1:A:198:VAL:HG23	2.20	0.42
1:A:830:LEU:HD22	1:A:972:SER:HA	2.01	0.42
1:A:980:LEU:HD23	1:A:980:LEU:HA	1.83	0.42
1:A:794:GLN:HB3	1:A:796:GLU:OE2	2.20	0.42
1:A:79:VAL:HB	1:A:953:LYS:HG3	2.02	0.42
1:A:484:ASN:HD21	1:A:514:ARG:HG2	1.84	0.42
1:A:1056:ALA:HB1	1:A:1224:ILE:HB	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1199:ARG:O	1:A:1203:GLU:OE1	2.38	0.42
1:A:1221:LEU:HA	1:A:1224:ILE:HG12	2.01	0.42
1:A:682:GLN:HG2	1:A:686:PHE:HE2	1.83	0.42
1:A:1040:GLN:C	1:A:1043:ARG:HH12	2.27	0.42
1:A:1088:LYS:HE2	1:A:1088:LYS:HB3	1.62	0.42
1:A:275:LEU:HD23	1:A:758:ASN:HD21	1.85	0.41
1:A:555:GLY:O	1:A:556:ARG:HG3	2.19	0.41
1:A:101:TRP:CD1	1:A:931:GLY:HA3	2.55	0.41
1:A:1088:LYS:NZ	1:A:1098:ILE:HD11	2.35	0.41
1:A:1028:HIS:O	1:A:1081:GLY:HA2	2.20	0.41
1:A:1142:HIS:O	1:A:1142:HIS:ND1	2.53	0.41
1:A:1060:PRO:HG2	1:A:1063:CYS:SG	2.60	0.41
1:A:438:LYS:C	1:A:440:ARG:H	2.28	0.41
1:A:847:LEU:O	1:A:850:VAL:HG22	2.20	0.41
1:A:56:CYS:O	1:A:60:LEU:HD23	2.21	0.41
1:A:365:THR:C	1:A:554:ILE:HD12	2.46	0.41
1:A:780:MET:HE2	1:A:780:MET:HB3	1.93	0.41
1:A:821:ILE:HG23	1:A:822:SER:N	2.36	0.41
1:A:369:GLU:HA	1:A:392:SER:HA	2.03	0.40
1:A:371:LYS:HG2	1:A:372:ASN:N	2.37	0.40
1:A:559:LEU:O	1:A:559:LEU:HD23	2.21	0.40
1:A:780:MET:HE1	1:A:809:ASP:OD2	2.21	0.40
1:A:370:LEU:HB3	1:A:390:CYS:HA	2.03	0.40
1:A:371:LYS:N	1:A:390:CYS:SG	2.89	0.40
1:A:441:TRP:O	1:A:444:GLN:HB2	2.21	0.40
1:A:539:SER:O	1:A:543:LYS:HE2	2.22	0.40
1:A:764:PHE:O	1:A:768:VAL:HG12	2.21	0.40
1:A:457:ALA:HA	1:A:501:GLY:HA2	2.04	0.40
1:A:813:VAL:CG2	1:A:993:MET:HB3	2.52	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	1140/1327 (86%)	1080 (95%)	60 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	930/1087 (86%)	926 (100%)	4 (0%)	89	94

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	806	LEU
1	A	812	ASN
1	A	844	ARG
1	A	1038	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	HIS
1	A	323	GLN
1	A	387	ASN
1	A	445	GLN
1	A	513	GLN
1	A	812	ASN
1	A	826	GLN
1	A	827	ASN
1	A	863	GLN
1	A	911	ASN
1	A	934	GLN
1	A	1142	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

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	ANP	A	1304	2	29,33,33	1.22	5 (17%)	31,52,52	1.12	3 (9%)
3	ANP	A	1303	2	29,33,33	1.20	5 (17%)	31,52,52	1.17	3 (9%)

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	ANP	A	1304	2	-	3/14/38/38	0/3/3/3
3	ANP	A	1303	2	-	6/14/38/38	0/3/3/3

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1304	ANP	PG-O1G	3.26	1.51	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1303	ANP	PG-O1G	3.12	1.51	1.46
3	A	1303	ANP	PB-O1B	2.98	1.50	1.46
3	A	1304	ANP	PB-O1B	2.93	1.50	1.46
3	A	1304	ANP	PB-O2B	-2.22	1.50	1.56
3	A	1303	ANP	PB-O2B	-2.22	1.50	1.56
3	A	1303	ANP	PG-O3G	-2.07	1.51	1.56
3	A	1304	ANP	PG-O3G	-2.06	1.51	1.56
3	A	1303	ANP	PG-O2G	-2.06	1.51	1.56
3	A	1304	ANP	PG-O2G	-2.06	1.51	1.56

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1303	ANP	O2B-PB-O1B	4.19	118.71	109.92
3	A	1304	ANP	O2B-PB-O1B	4.06	118.44	109.92
3	A	1304	ANP	C5-C6-N6	2.29	123.83	120.35
3	A	1303	ANP	C5-C6-N6	2.24	123.76	120.35
3	A	1304	ANP	O3G-PG-O1G	-2.08	108.23	113.45
3	A	1303	ANP	O3G-PG-O1G	-2.03	108.36	113.45

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1303	ANP	PB-N3B-PG-O1G
3	A	1303	ANP	PG-N3B-PB-O1B
3	A	1303	ANP	PB-O3A-PA-O5'
3	A	1304	ANP	PB-N3B-PG-O1G
3	A	1304	ANP	PG-N3B-PB-O1B
3	A	1304	ANP	PG-N3B-PB-O3A
3	A	1303	ANP	O4'-C4'-C5'-O5'
3	A	1303	ANP	C3'-C4'-C5'-O5'
3	A	1303	ANP	C5'-O5'-PA-O1A

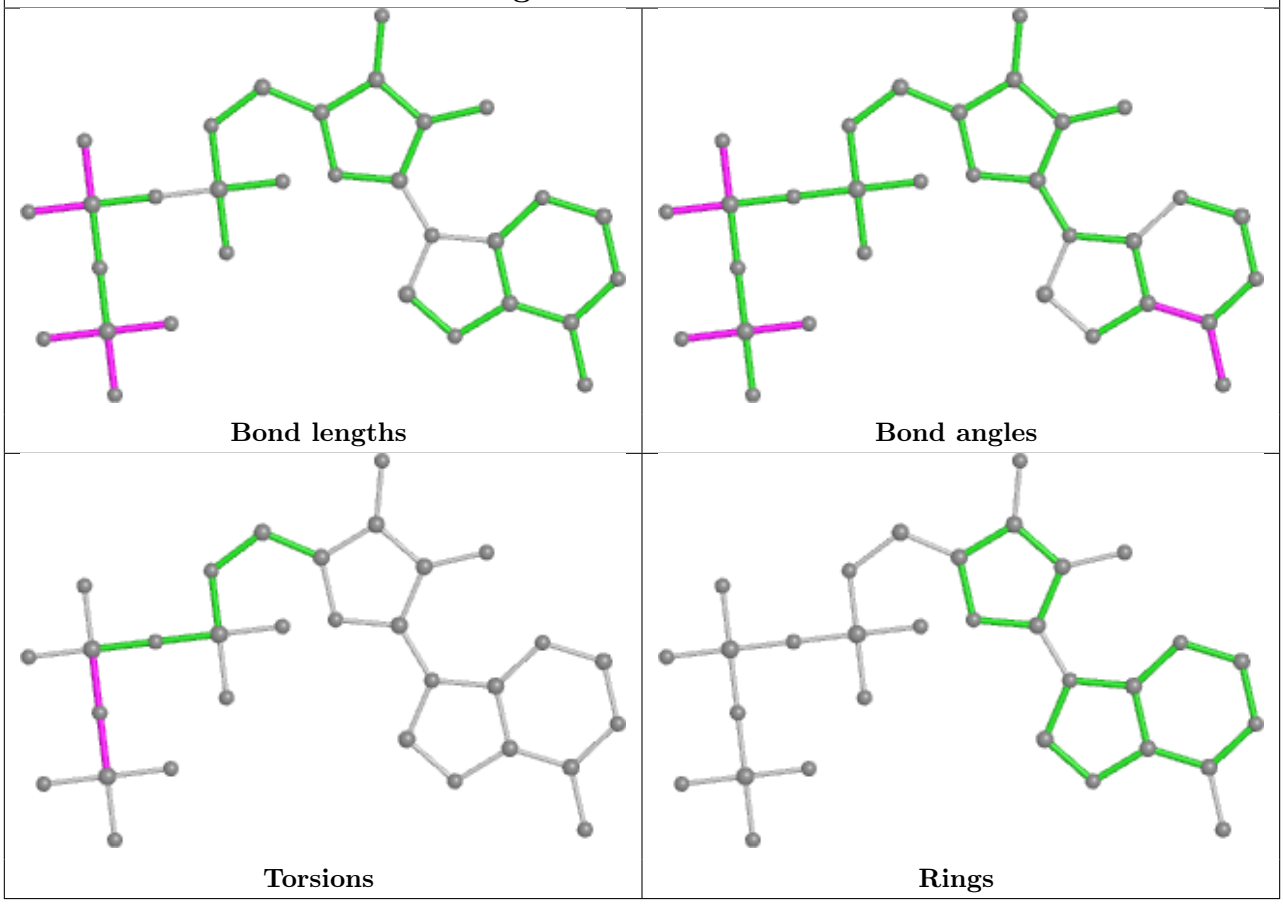
There are no ring outliers.

No monomer is involved in short contacts.

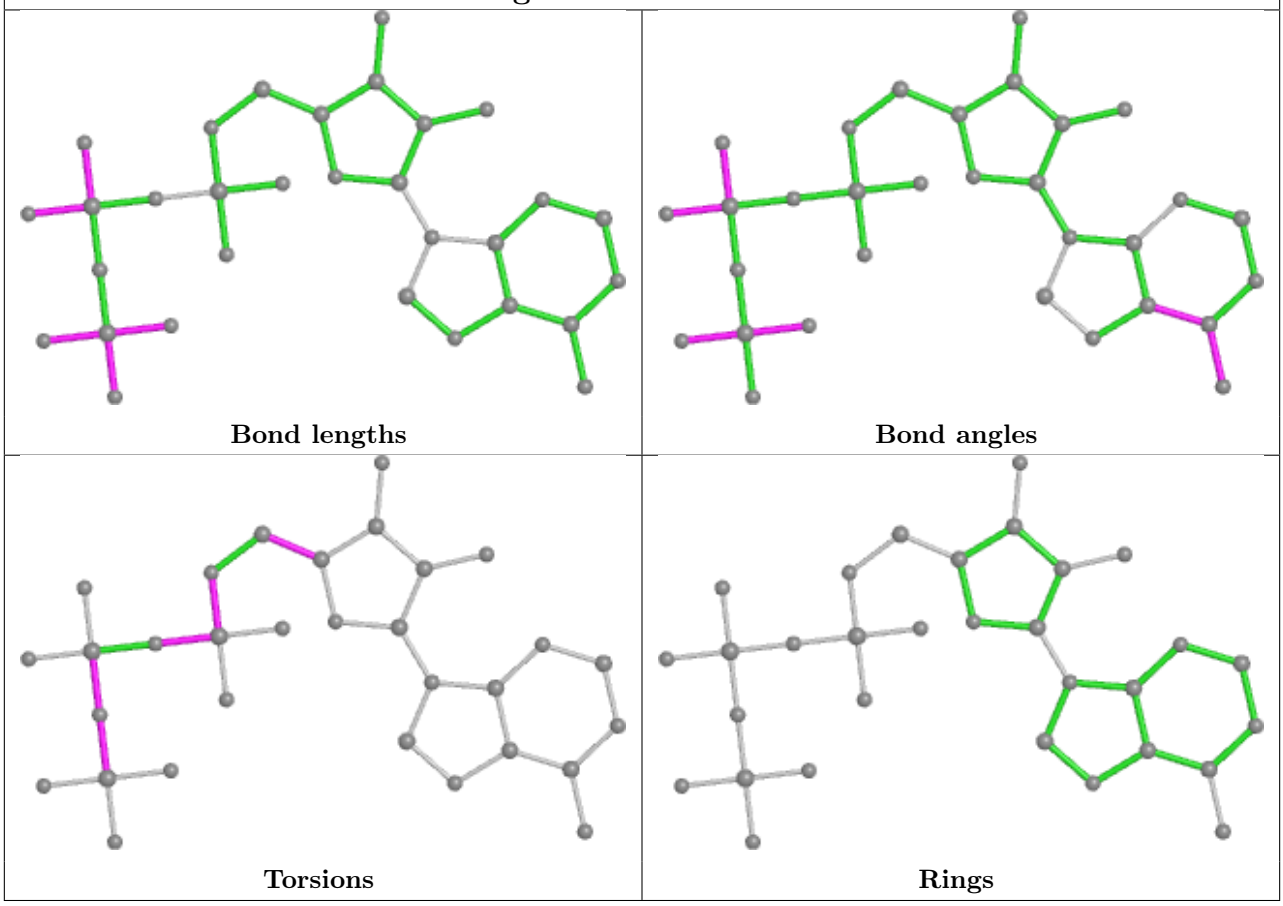
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 ANP A 1304



Ligand ANP A 1303



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.

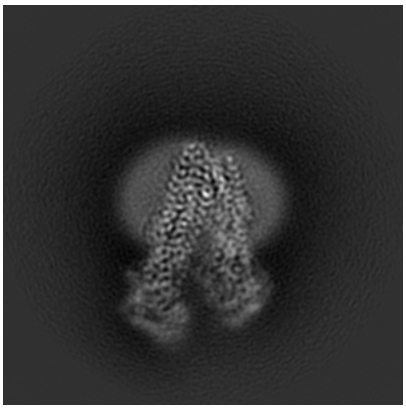
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-61832. These allow visual inspection of the internal detail of the map and identification of artifacts.

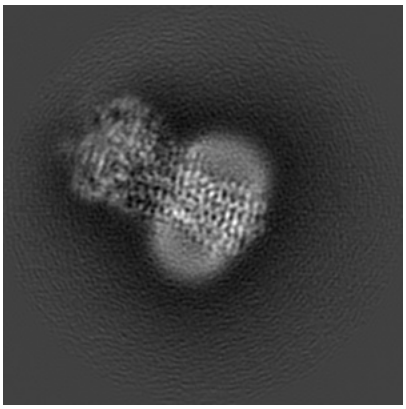
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

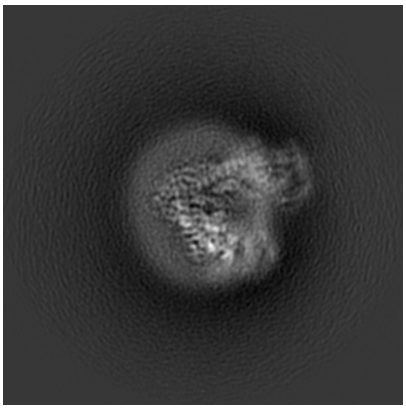
6.1.1 Primary map



X

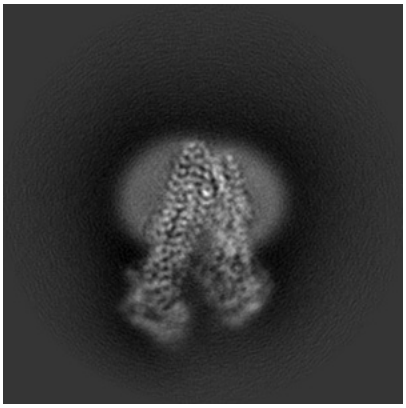


Y

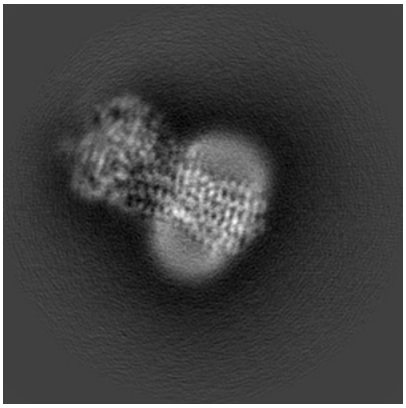


Z

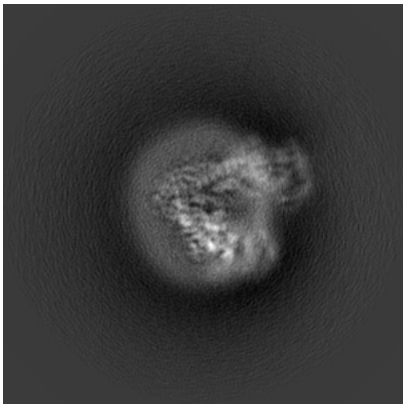
6.1.2 Raw map



X



Y

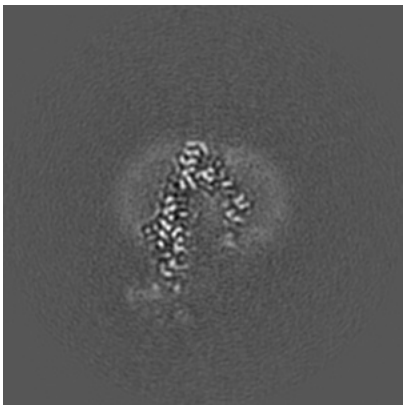


Z

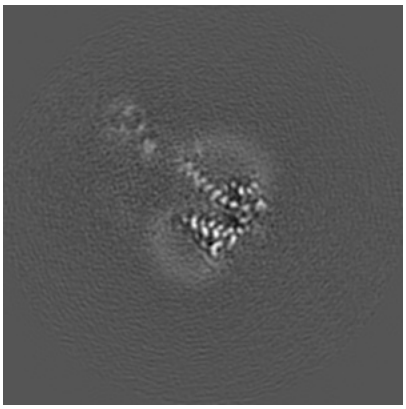
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

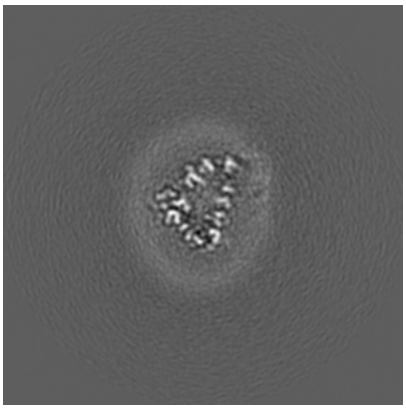
6.2.1 Primary map



X Index: 120

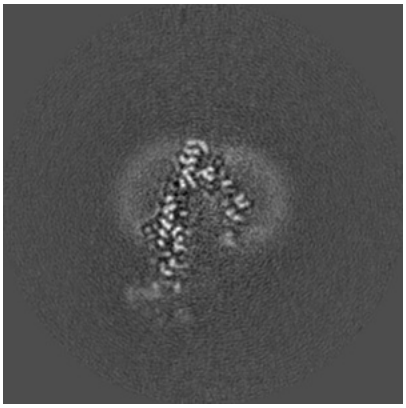


Y Index: 120

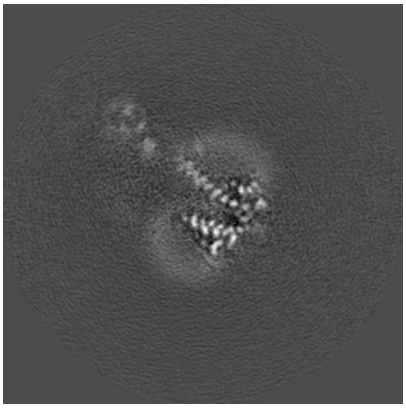


Z Index: 120

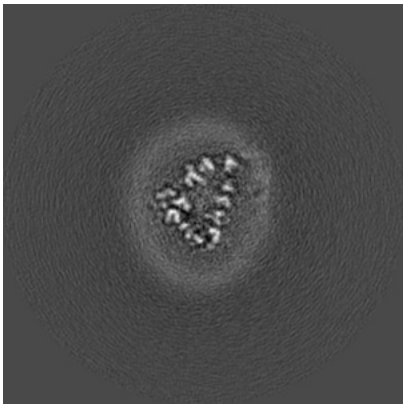
6.2.2 Raw map



X Index: 120



Y Index: 120

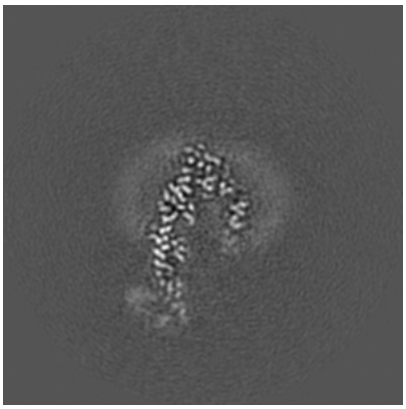


Z Index: 120

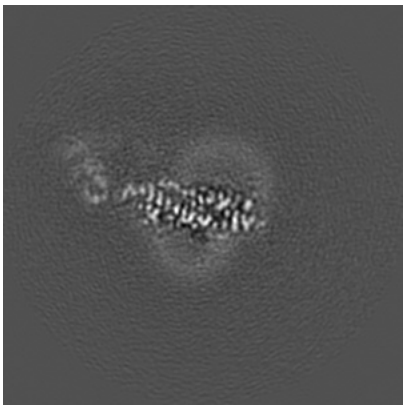
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

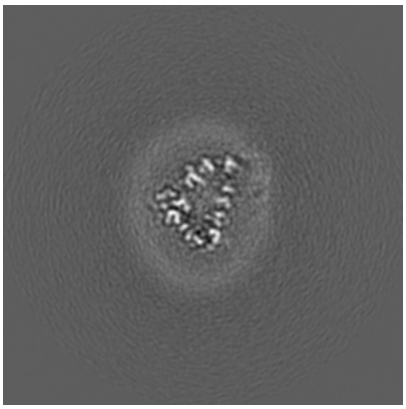
6.3.1 Primary map



X Index: 123

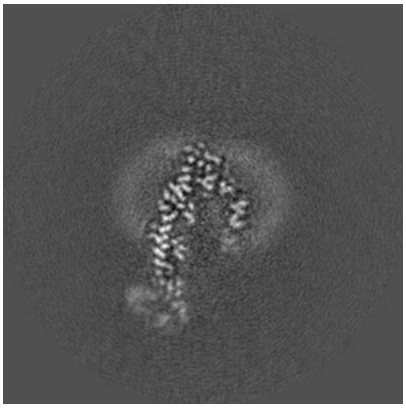


Y Index: 107

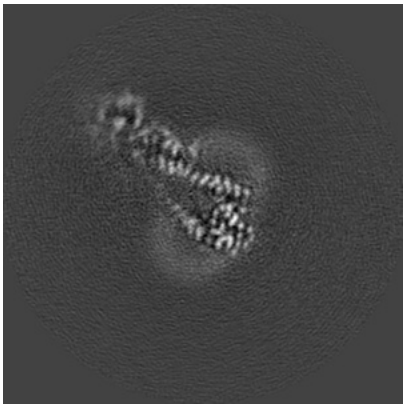


Z Index: 120

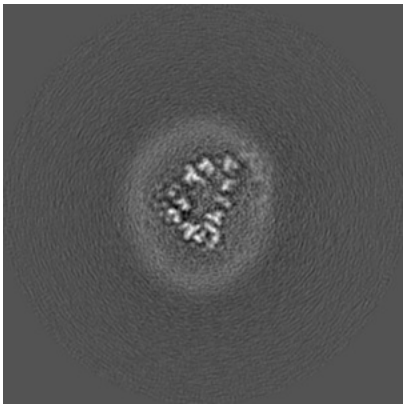
6.3.2 Raw map



X Index: 123



Y Index: 130

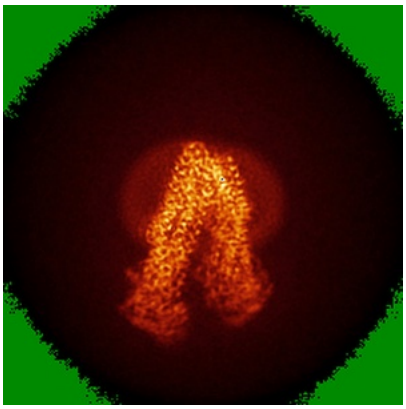


Z Index: 119

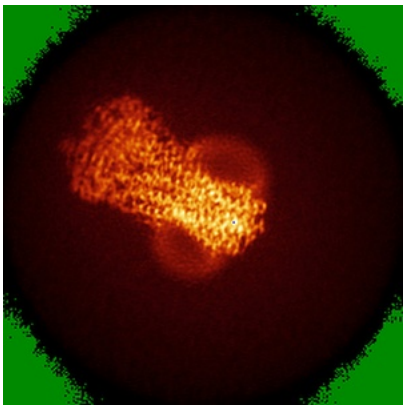
The images above show the largest variance slices of the map in three orthogonal directions.

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

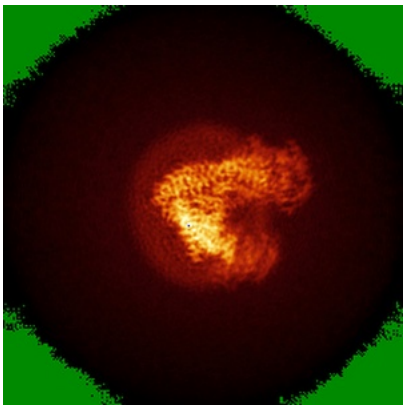
6.4.1 Primary map



X

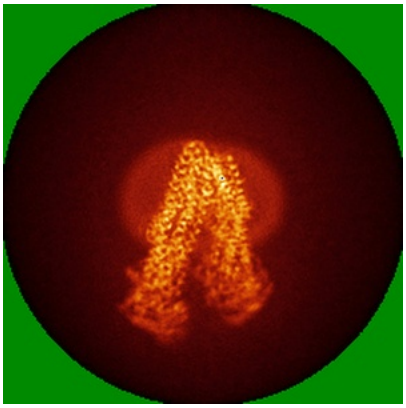


Y

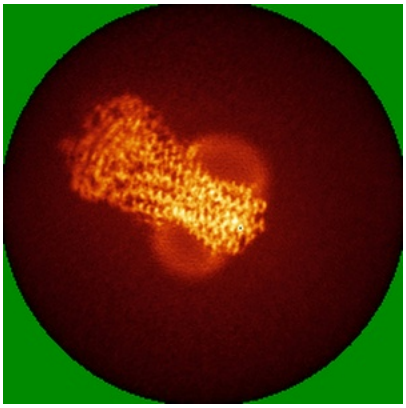


Z

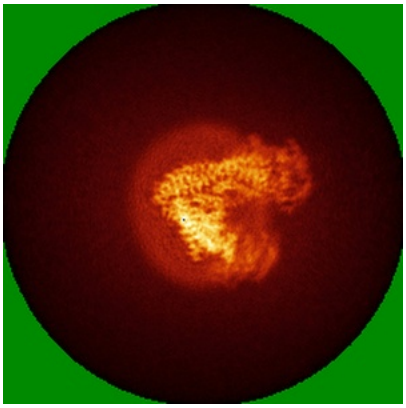
6.4.2 Raw map



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 0.014. 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.

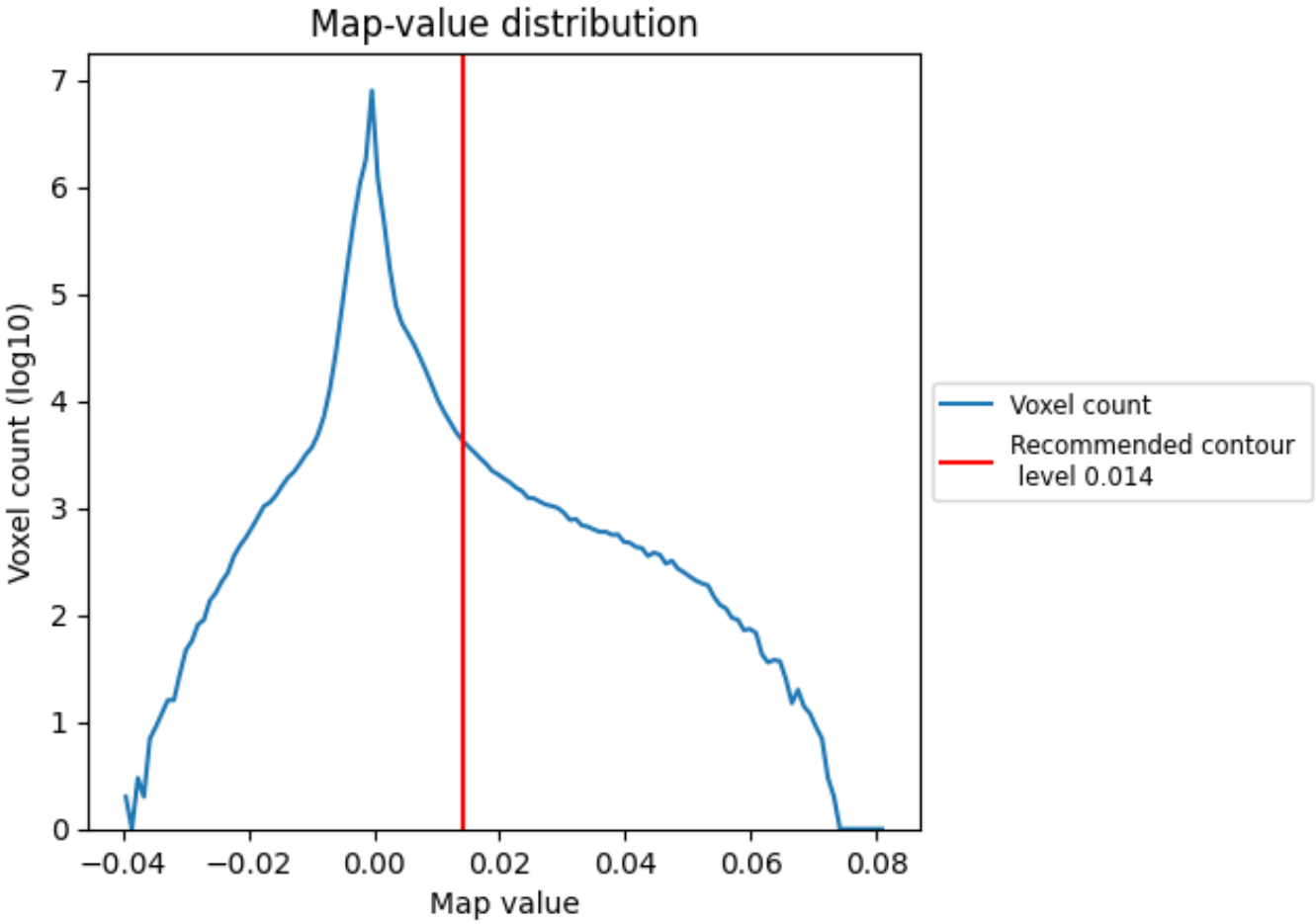
6.6 Mask visualisation (i)

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

7 Map analysis

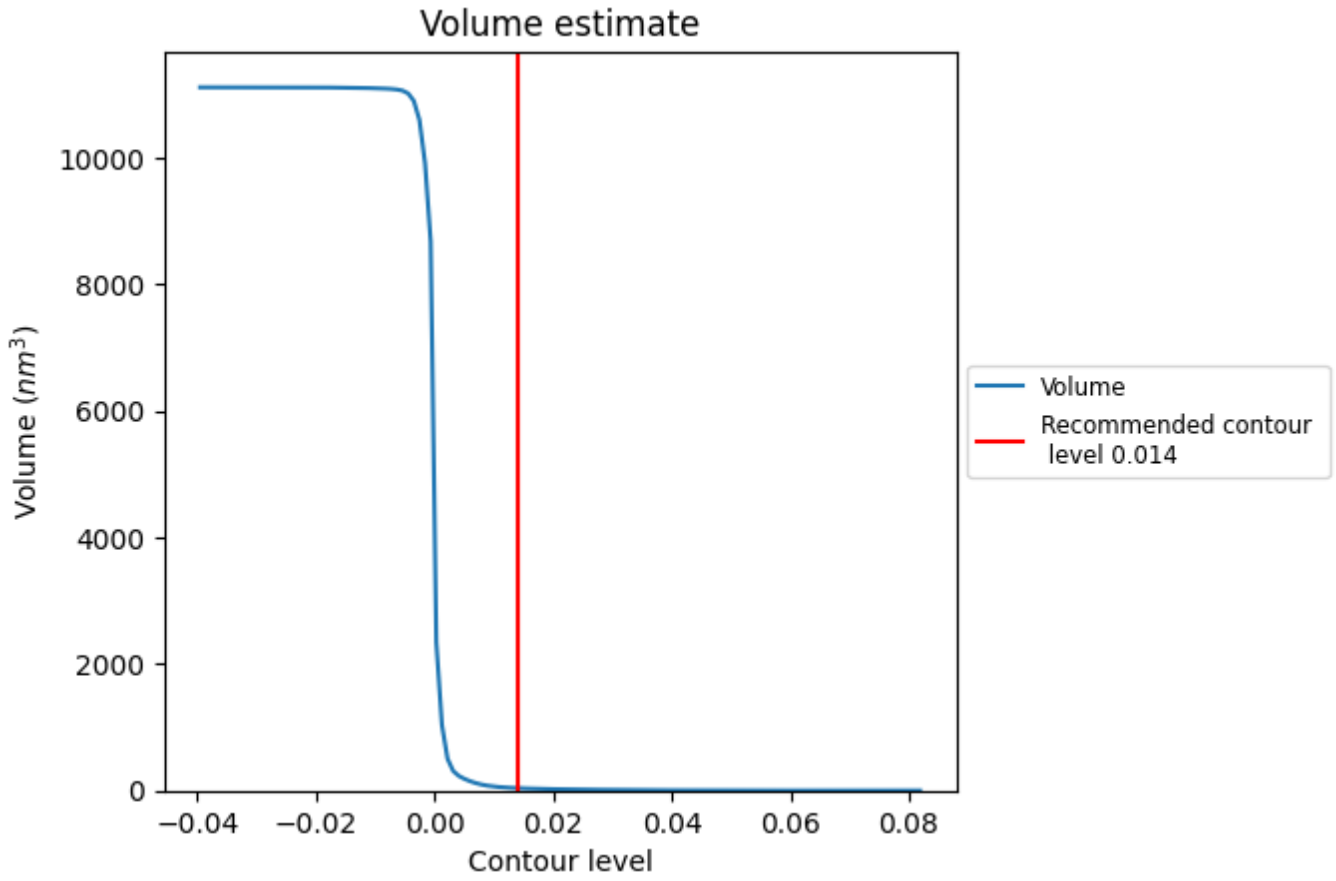
This section contains the results of statistical analysis of the map.

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.

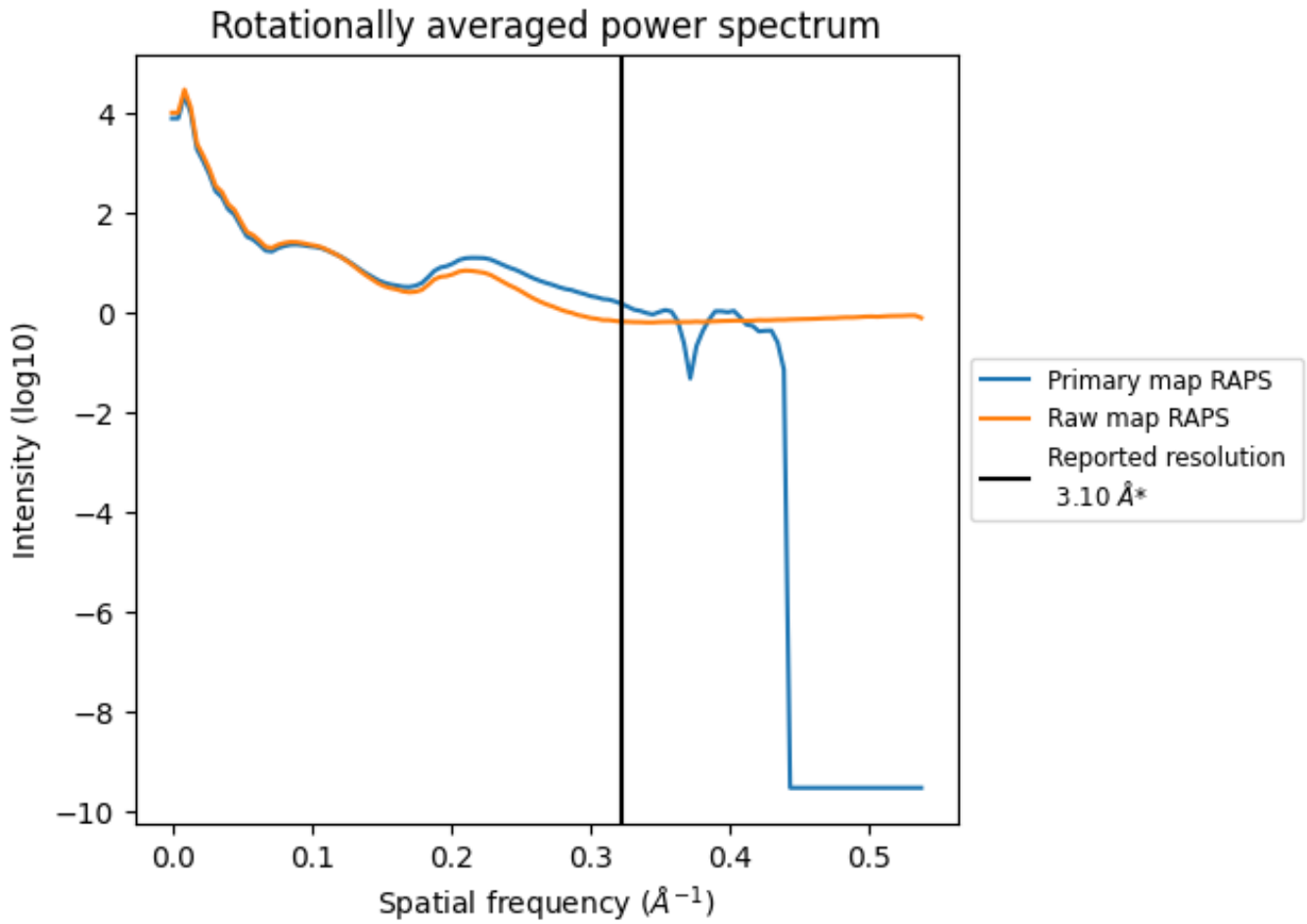
7.2 Volume estimate (i)



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)

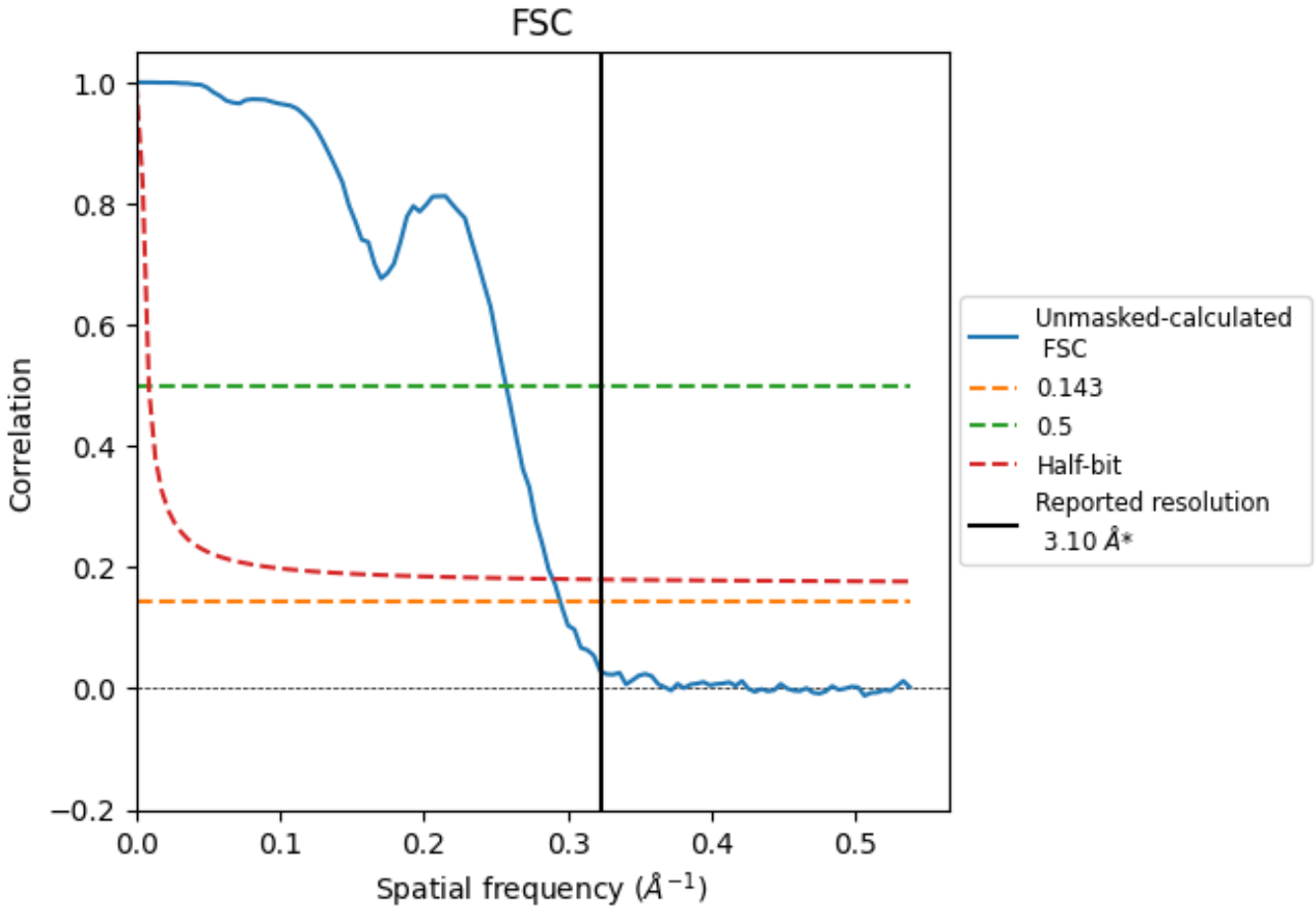


*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

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 0.323 Å^{-1}

8.2 Resolution estimates (i)

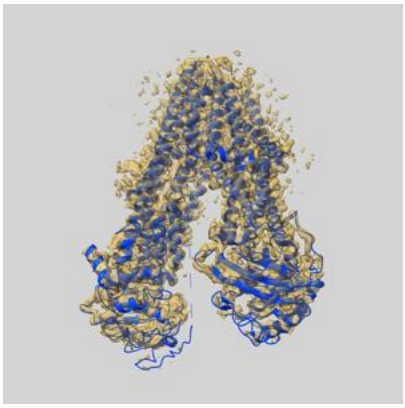
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.39	3.89	3.45

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

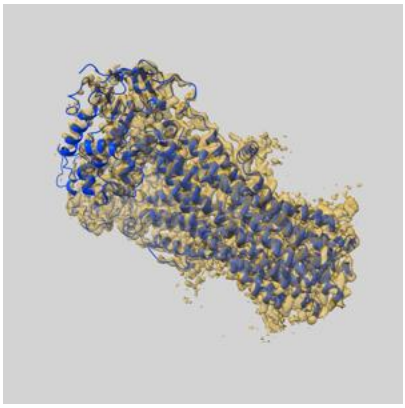
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-61832 and PDB model 9JUO. Per-residue inclusion information can be found in section 3 on page 6.

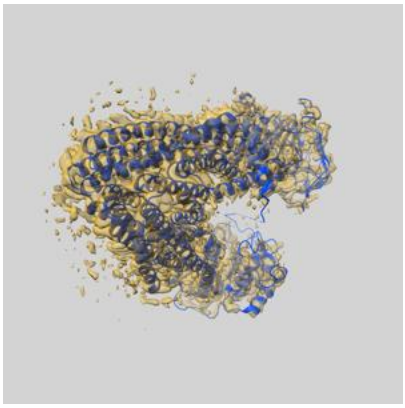
9.1 Map-model overlay



X



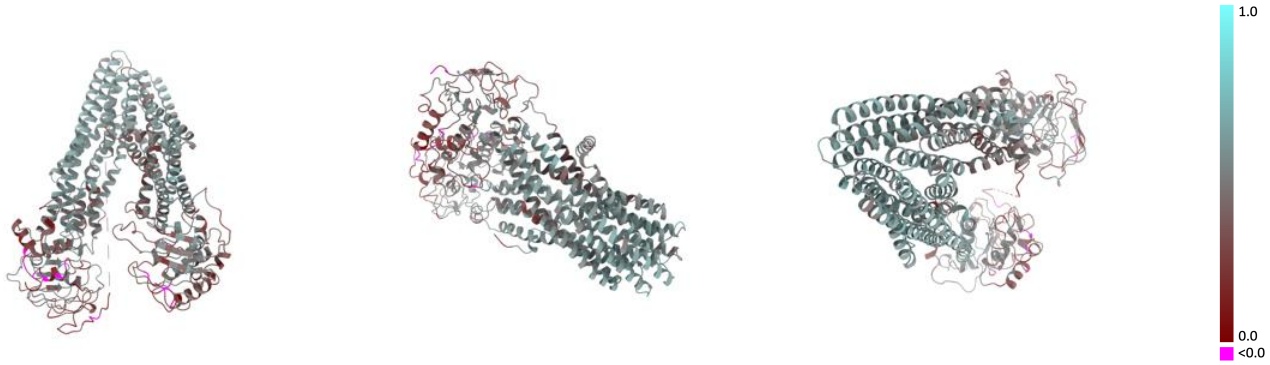
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.014 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.

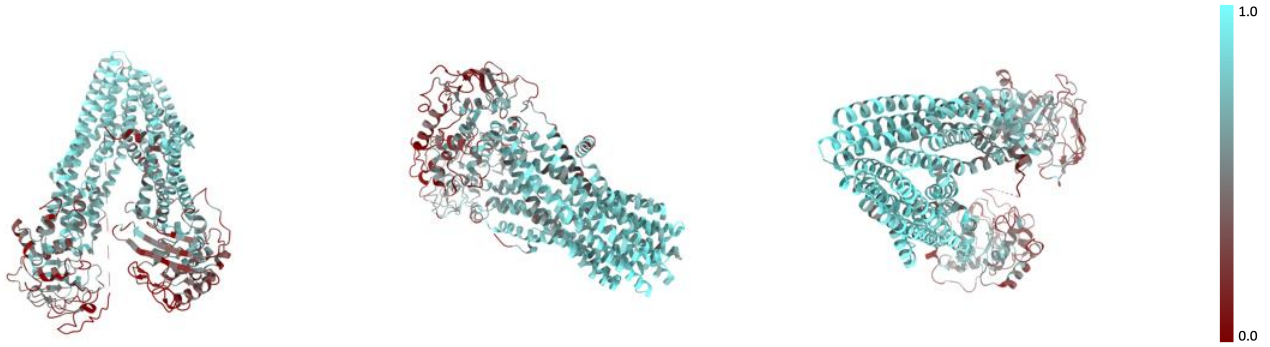
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

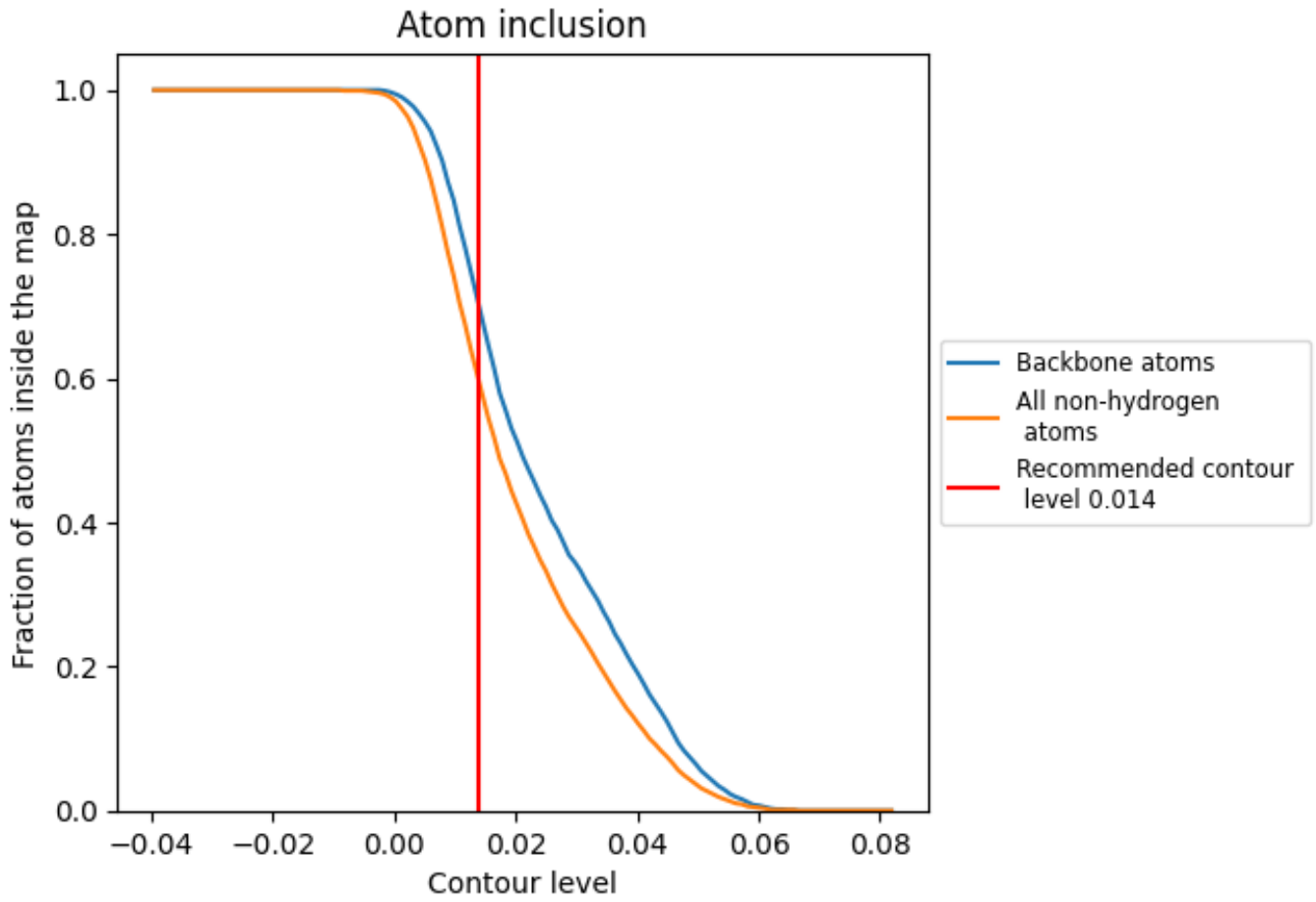
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.014).

9.4 Atom inclusion (i)



At the recommended contour level, 70% of all backbone atoms, 59% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.014) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5940	0.4610
A	0.5940	0.4610