



Full wwPDB EM Validation Report ⓘ

Jun 27, 2024 – 03:08 AM JST

PDB ID : 8IOY
EMDB ID : EMD-35628
Title : Structure of ATP7B C983S/C985S/D1027A mutant with AMP-PNP
Authors : Yang, G.; Xu, L.; Guo, J.; Wu, Z.
Deposited on : 2023-03-13
Resolution : 4.00 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.dev92
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

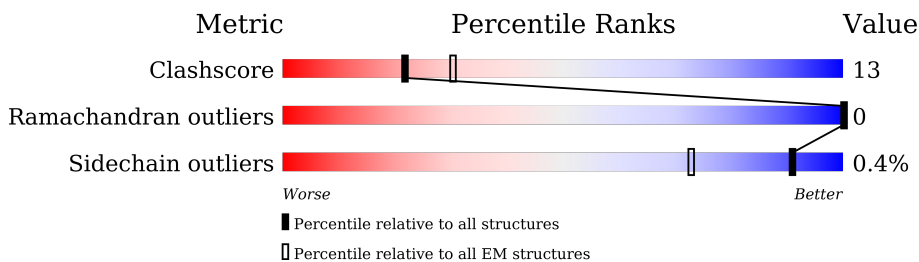
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.00 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	1507	

2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 12616 atoms, of which 6431 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 Copper-transporting ATPase 2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	816	12572	3948	6418	1045	1122	39	0	0

There are 45 discrepancies between the modelled and reference sequences:

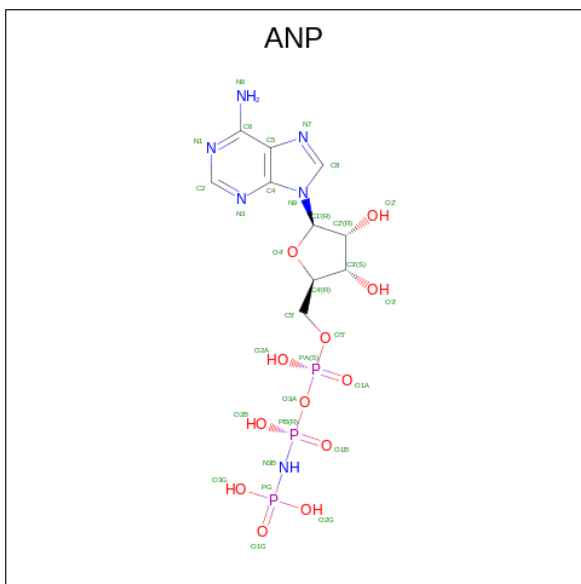
Chain	Residue	Modelled	Actual	Comment	Reference
A	983	SER	CYS	engineered mutation	UNP P35670
A	985	SER	CYS	engineered mutation	UNP P35670
A	1027	ALA	ASP	engineered mutation	UNP P35670
A	1466	VAL	-	expression tag	UNP P35670
A	1467	ASP	-	expression tag	UNP P35670
A	1468	GLU	-	expression tag	UNP P35670
A	1469	LEU	-	expression tag	UNP P35670
A	1470	THR	-	expression tag	UNP P35670
A	1471	SER	-	expression tag	UNP P35670
A	1472	ARG	-	expression tag	UNP P35670
A	1473	GLY	-	expression tag	UNP P35670
A	1474	ARG	-	expression tag	UNP P35670
A	1475	ASP	-	expression tag	UNP P35670
A	1476	TYR	-	expression tag	UNP P35670
A	1477	LYS	-	expression tag	UNP P35670
A	1478	ASP	-	expression tag	UNP P35670
A	1479	ASP	-	expression tag	UNP P35670
A	1480	ASP	-	expression tag	UNP P35670
A	1481	ASP	-	expression tag	UNP P35670
A	1482	LYS	-	expression tag	UNP P35670
A	1483	TRP	-	expression tag	UNP P35670
A	1484	SER	-	expression tag	UNP P35670
A	1485	HIS	-	expression tag	UNP P35670
A	1486	PRO	-	expression tag	UNP P35670
A	1487	GLN	-	expression tag	UNP P35670
A	1488	PHE	-	expression tag	UNP P35670
A	1489	GLU	-	expression tag	UNP P35670
A	1490	LYS	-	expression tag	UNP P35670

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1491	GLY	-	expression tag	UNP P35670
A	1492	GLY	-	expression tag	UNP P35670
A	1493	GLY	-	expression tag	UNP P35670
A	1494	GLY	-	expression tag	UNP P35670
A	1495	SER	-	expression tag	UNP P35670
A	1496	GLY	-	expression tag	UNP P35670
A	1497	GLY	-	expression tag	UNP P35670
A	1498	SER	-	expression tag	UNP P35670
A	1499	ALA	-	expression tag	UNP P35670
A	1500	TRP	-	expression tag	UNP P35670
A	1501	SER	-	expression tag	UNP P35670
A	1502	HIS	-	expression tag	UNP P35670
A	1503	PRO	-	expression tag	UNP P35670
A	1504	GLN	-	expression tag	UNP P35670
A	1505	PHE	-	expression tag	UNP P35670
A	1506	GLU	-	expression tag	UNP P35670
A	1507	LYS	-	expression tag	UNP P35670

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: C₁₀H₁₇N₆O₁₂P₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
2	A	1	44	10	13	6	12	3	0

ASP	L1368	M1257	D1171	M1108	K1028	G915	L813
GLY	L1371	K1258	H1172	V1109	T1028	L916	I814
ASP	Q1372	E1110	E1173	E1110	G1030	F920	I815
TRP	E1385	K1261	M1174	G1111	T1031	F926	I816
LEU	V1265	V1265	K1175	I1112	R1038	V937	E817
LEU	D1279	D1279	G1176	L1113	V1039	I929	E818
LEU	V1282	V1282	Q1177	A1114	M1040	I930	E823
ASN	A1283	A1283	T1178	A1114	R1041	I931	L824
GLY	I1284	I1284	A1179	SER	V1042	S932	V825
ARG	G1285	G1285	I1184	GLU	L1043	I933	Q826
ASP	T1286	T1286	D1185	ARG	L1044	L934	
ASP	V1297	V1297	G1186	PRO	L1045	V937	K832
GLN	L1298	L1298	V1187	LEU	L1046	V938	G836
TYR	I1299	I1299	L1188	ALA	G1046	I938	
ILE	L1300	L1300	C1189	PRO	D1047	I939	
VAL	I1300	I1300	G1190	ALA	V1048	I940	D842
ASP	R1301	R1301	M1191	ALA	A1048	V941	G843
GLU	M1302	M1302	I1192	SER	A1049	I942	
LEU	D1303	D1303	A1193	HIS	T1050	G943	L846
THR	SER	SER	I1194	ASN	L1051	F947	E847
SER	TRP	TRP	I1194	GLU	P1052	I951	G848
ARG	ARG	ARG	A1195	ALA	L1053	R952	N849
GLY	ASP	ASP	D1196	GLY	R1054	F955	T850
ASP	SER	SER	A1197	LEU	K1054	N956	M851
ASP	PRO	PRO	V1198	LEU	V1056	I957	A852
TYR	ARG	ARG	K1199	ALA	L1057	R958	D853
LYS	ALA	ALA	Q1200	ALA	V1060	K959	E854
ASP	K1315	K1315	L1204	GLU	L1071	I961	S855
ASP	V1318	V1318	A1205	LYS	G1072	S962	L856
ASP	R1319	R1319	V1206	ASP	V1073	Q963	M862
LYS	R1320	R1320	H1207	ALA	A1074	I964	P863
TRP	I1321	I1321	T1208	VAL	T1075	V964	V864
SER	SER	SER	D1215	PRO	A1076	E965	K867
HIS	TRP	TRP	V1216	THR	T1076	I967	A874
PRO	VAL	VAL	I1218	THR	C1079	I968	G875
GLN	PHE	PHE	I1219	THR	K1080	T974	S876
GLU	GLN	GLN	D1222	THR	E1081	S975	I877
PHE	GLN	GLN	M1223	THR	E1082	I976	N878
GLU	VAL	VAL	R1224	THR	L1083	I978	A879
LYS	VAL	VAL	R1228	THR	E1086	L979	H880
LYS	LEU	LEU	A1231	THR	T1087	L989	G881
GLY	SER	SER	V1234	THR	L1088	T993	K886
GLY	ASP	ASP	G1235	THR	G1089	I1006	T895
GLY	PRO	PRO	I1236	THR	Y1090	G1012	L896
GLY	ALA	ALA	V1239	THR	C1091	G1015	K901
GLY	ALA	ALA	F1240	THR	T1092	L1015	L902
GLY	ASP	ASP	E1242	THR	F1094	E1016	S909
GLY	ASP	ASP	H1247	THR	S1162	K1022	P912
GLY	ASP	ASP	K1248	THR	S1163		
GLY	ASP	ASP	V1249	THR	D1164		
GLY	ASP	ASP		THR	F1094		
GLY	ASP	ASP		THR	S1166		
GLY	ASP	ASP		THR	D1167		
GLY	ASP	ASP		THR	T1170		
GLY	ASP	ASP		THR	V1106		
GLY	ASP	ASP		THR	S1107		

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	350373	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	52	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.045	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.015	Depositor
Map size (\AA)	243.36002, 243.36002, 243.36002	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.014, 1.014, 1.014	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: ANP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.25	0/6260	0.47	0/8502

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 [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	6154	6418	6418	163	0
2	A	31	13	13	3	0
All	All	6185	6431	6431	163	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 (163) 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:785:LYS:O	1:A:788:THR:OG1	1.95	0.85
1:A:1282:VAL:HG12	1:A:1297:VAL:HB	1.64	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1029:THR:OG1	2:A:2000:ANP:O2B	2.01	0.78
1:A:1307:VAL:O	1:A:1311:ILE:HD12	1.85	0.76
1:A:1224:ARG:N	1:A:1242:GLU:OE2	2.18	0.76
1:A:1265:VAL:HG12	1:A:1282:VAL:CG2	2.15	0.76
1:A:1199:LYS:NZ	1:A:1302:ASN:OD1	2.20	0.75
1:A:1398:SER:OG	1:A:1399:GLN:OE1	2.05	0.74
1:A:1015:LEU:O	1:A:1314:SER:OG	2.08	0.72
1:A:728:ASN:O	1:A:731:VAL:HG12	1.90	0.71
1:A:693:SER:N	1:A:759:SER:OG	2.24	0.70
1:A:895:THR:HG23	1:A:896:LEU:HD12	1.74	0.70
1:A:1231:ALA:O	1:A:1235:GLY:N	2.24	0.68
1:A:909:SER:OG	1:A:1012:GLY:N	2.26	0.67
1:A:1265:VAL:HG12	1:A:1282:VAL:HG22	1.75	0.67
1:A:1329:LEU:O	1:A:1333:LEU:HD12	1.94	0.67
1:A:611:GLU:N	1:A:611:GLU:OE1	2.28	0.67
1:A:622:ILE:HA	1:A:625:ILE:HD12	1.78	0.66
1:A:727:ALA:HB1	1:A:731:VAL:HG11	1.78	0.66
1:A:854:GLU:OE2	1:A:876:SER:OG	2.15	0.64
1:A:1385:GLU:O	1:A:1389:HIS:N	2.32	0.62
1:A:1146:VAL:O	1:A:1147:LEU:HD23	2.00	0.61
1:A:619:ILE:O	1:A:623:GLU:OE1	2.19	0.61
1:A:736:ALA:HB2	1:A:979:LEU:HD11	1.82	0.61
1:A:647:ILE:HG22	1:A:782:HIS:HB3	1.83	0.61
1:A:582:ILE:HD13	1:A:625:ILE:HD13	1.83	0.61
1:A:1050:THR:HG23	1:A:1051:LEU:HG	1.81	0.60
1:A:930:ILE:O	1:A:934:LEU:HD23	2.01	0.59
1:A:874:ALA:O	1:A:896:LEU:HD13	2.01	0.59
1:A:741:TYR:O	1:A:745:LEU:HD23	2.02	0.59
1:A:1261:LYS:NZ	1:A:1279:ASP:OD2	2.31	0.59
1:A:691:GLY:N	1:A:756:ALA:O	2.38	0.57
1:A:1151:ARG:NH2	1:A:1173:GLU:OE2	2.38	0.56
1:A:1223:ASN:OD1	1:A:1224:ARG:N	2.38	0.56
1:A:813:LEU:HD11	1:A:815:ILE:HD11	1.87	0.56
1:A:1016:GLU:HA	1:A:1318:VAL:HG21	1.87	0.56
1:A:570:ILE:HD11	1:A:627:PHE:HB3	1.89	0.55
1:A:1216:VAL:HG12	1:A:1236:ILE:HD12	1.88	0.55
1:A:736:ALA:HB2	1:A:979:LEU:CD1	2.37	0.55
1:A:745:LEU:O	1:A:749:VAL:HG23	2.08	0.54
1:A:1219:ILE:HD12	1:A:1240:PHE:HB2	1.89	0.54
1:A:1047:ASP:OD1	1:A:1048:VAL:N	2.40	0.54
1:A:963:GLN:HA	1:A:966:VAL:HG12	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1145:SER:N	1:A:1185:ASP:OD1	2.42	0.53
1:A:1248:LYS:HG3	1:A:1249:VAL:HG23	1.90	0.53
1:A:579:VAL:O	1:A:583:GLU:OE1	2.27	0.52
1:A:1320:ARG:NH1	1:A:1372:GLN:OE1	2.38	0.52
1:A:1204:LEU:O	1:A:1208:THR:HG23	2.10	0.52
1:A:745:LEU:HD22	1:A:764:PHE:CZ	2.45	0.52
1:A:709:LEU:HD12	1:A:710:GLY:N	2.24	0.52
1:A:1041:ARG:NH1	1:A:1043:LEU:HD11	2.25	0.52
1:A:1206:VAL:HG21	1:A:1236:ILE:HD11	1.91	0.52
1:A:1284:ILE:HG12	1:A:1299:LEU:HD12	1.92	0.52
1:A:682:MET:O	1:A:682:MET:SD	2.68	0.52
1:A:732:LEU:HD13	1:A:979:LEU:O	2.10	0.52
1:A:826:GLN:OE1	1:A:826:GLN:N	2.43	0.52
1:A:937:VAL:O	1:A:941:VAL:HG22	2.10	0.52
1:A:667:LEU:HD12	1:A:668:MET:N	2.25	0.51
1:A:818:GLU:N	1:A:818:GLU:OE1	2.43	0.51
1:A:1184:ILE:HG22	1:A:1189:CYS:SG	2.49	0.51
1:A:743:TYR:HA	1:A:746:VAL:HG12	1.92	0.51
1:A:1321:ILE:O	1:A:1325:LEU:HD23	2.09	0.51
1:A:633:GLN:N	1:A:633:GLN:OE1	2.44	0.51
1:A:622:ILE:HG21	1:A:629:ALA:HB2	1.93	0.51
1:A:687:ASN:OD1	1:A:688:ILE:N	2.43	0.51
1:A:1171:ASP:OD1	1:A:1172:HIS:N	2.43	0.51
1:A:1207:HIS:NE2	1:A:1391:HIS:O	2.44	0.51
1:A:1234:VAL:HG23	1:A:1236:ILE:HG12	1.92	0.51
1:A:811:ASP:OD1	1:A:813:LEU:HD23	2.10	0.50
1:A:698:ILE:O	1:A:702:LEU:HD13	2.11	0.50
1:A:1148:ILE:HG22	2:A:2000:ANP:H2	1.93	0.50
1:A:582:ILE:CD1	1:A:625:ILE:HD13	2.42	0.50
1:A:989:LEU:O	1:A:993:THR:HG22	2.11	0.50
1:A:1146:VAL:HA	1:A:1184:ILE:HD12	1.94	0.49
1:A:915:GLN:NE2	1:A:916:LEU:HD12	2.27	0.49
1:A:1073:VAL:O	1:A:1076:THR:OG1	2.26	0.49
1:A:878:ASN:OD1	1:A:879:ALA:N	2.46	0.49
1:A:667:LEU:HD13	1:A:699:PHE:CE1	2.48	0.49
1:A:1364:VAL:O	1:A:1368:LEU:HD13	2.12	0.48
1:A:788:THR:HG22	1:A:1371:LEU:HD21	1.96	0.48
1:A:852:ALA:O	1:A:864:VAL:N	2.47	0.48
1:A:745:LEU:HD22	1:A:764:PHE:HZ	1.79	0.47
1:A:932:SER:HA	1:A:978:VAL:HG11	1.96	0.47
1:A:582:ILE:HG21	1:A:597:VAL:HG21	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1060:VAL:O	1:A:1064:GLU:HG3	2.15	0.47
1:A:1031:THR:HG23	1:A:1284:ILE:HD12	1.96	0.47
1:A:1088:LEU:HD12	1:A:1089:GLY:O	2.15	0.47
1:A:1346:ILE:HD12	1:A:1346:ILE:H	1.80	0.47
1:A:765:ASP:OD1	1:A:766:THR:N	2.48	0.47
1:A:1147:LEU:O	1:A:1148:ILE:HD13	2.15	0.46
1:A:1360:ALA:O	1:A:1364:VAL:HG22	2.15	0.46
1:A:744:SER:O	1:A:747:ILE:HG22	2.16	0.46
1:A:975:SER:O	1:A:978:VAL:HG12	2.16	0.46
1:A:1314:SER:O	1:A:1318:VAL:HG23	2.15	0.46
1:A:576:ALA:O	1:A:579:VAL:HG22	2.15	0.46
1:A:842:ASP:OD1	1:A:843:GLY:N	2.48	0.46
1:A:1146:VAL:CA	1:A:1184:ILE:HD12	2.45	0.46
1:A:1006:GLY:O	1:A:1300:ILE:HG22	2.15	0.46
1:A:1228:ARG:NE	1:A:1397:ALA:O	2.47	0.46
1:A:567:GLU:OE2	1:A:901:LYS:NZ	2.49	0.46
1:A:961:ILE:HG23	1:A:961:ILE:O	2.16	0.46
1:A:1265:VAL:O	1:A:1265:VAL:HG23	2.16	0.46
1:A:582:ILE:O	1:A:586:LEU:HD23	2.16	0.45
1:A:1088:LEU:HA	1:A:1112:ILE:HD11	1.98	0.45
1:A:1216:VAL:CG1	1:A:1236:ILE:HD12	2.45	0.45
1:A:1330:ILE:O	1:A:1334:VAL:HG22	2.16	0.45
1:A:939:TRP:NE1	1:A:974:THR:HG21	2.31	0.45
1:A:1194:ILE:HG23	1:A:1194:ILE:O	2.16	0.45
1:A:1079:CYS:O	1:A:1083:LEU:HD13	2.17	0.45
1:A:1206:VAL:HG21	1:A:1236:ILE:CD1	2.47	0.45
1:A:618:ILE:H	1:A:618:ILE:HD12	1.82	0.44
1:A:767:PRO:HG2	1:A:768:PRO:HD3	1.99	0.44
1:A:1311:ILE:O	1:A:1315:LYS:HG2	2.16	0.44
1:A:912:PRO:O	1:A:916:LEU:HD13	2.17	0.44
1:A:668:MET:O	1:A:672:LEU:HD13	2.16	0.44
1:A:846:LEU:HD21	1:A:886:LYS:HB2	2.00	0.44
1:A:1286:THR:O	1:A:1286:THR:HG23	2.18	0.44
1:A:943:GLY:HA3	1:A:967:ILE:HG12	2.00	0.44
1:A:1396:THR:OG1	1:A:1399:GLN:OE1	2.35	0.43
1:A:622:ILE:O	1:A:625:ILE:HB	2.18	0.43
1:A:1218:LEU:HB3	1:A:1239:VAL:HG12	2.00	0.43
1:A:1064:GLU:OE2	1:A:1075:VAL:HG13	2.18	0.43
1:A:621:ILE:HA	1:A:624:GLU:HG2	1.99	0.43
1:A:758:ARG:NE	1:A:758:ARG:HA	2.33	0.43
1:A:1286:THR:CG2	1:A:1298:VAL:HG13	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:926:PRO:HA	1:A:929:ILE:HG12	2.00	0.43
1:A:1303:ASP:HB3	1:A:1306:ASP:OD2	2.19	0.43
1:A:902:LEU:HD23	1:A:902:LEU:C	2.39	0.43
1:A:767:PRO:CG	1:A:768:PRO:HD3	2.49	0.42
1:A:811:ASP:O	1:A:812:ASN:OD1	2.37	0.42
1:A:1191:MET:SD	1:A:1192:ILE:N	2.92	0.42
1:A:735:LEU:O	1:A:739:ILE:HG12	2.19	0.42
1:A:1073:VAL:HA	1:A:1076:THR:OG1	2.20	0.42
1:A:695:LEU:O	1:A:698:ILE:HG22	2.19	0.42
1:A:1247:HIS:O	1:A:1249:VAL:N	2.52	0.42
1:A:578:CYS:O	1:A:582:ILE:HG12	2.19	0.42
1:A:1038:ARG:NH1	1:A:1039:VAL:O	2.53	0.42
1:A:1336:ILE:HB	1:A:1337:PRO:HD3	2.00	0.42
1:A:695:LEU:HD11	1:A:699:PHE:CE1	2.55	0.42
1:A:667:LEU:HD13	1:A:699:PHE:CZ	2.55	0.42
1:A:733:ILE:HG23	1:A:770:LEU:HD21	2.01	0.42
1:A:698:ILE:O	1:A:701:ILE:HG12	2.20	0.42
1:A:766:THR:HG23	1:A:767:PRO:HD3	2.01	0.41
1:A:1352:PRO:O	1:A:1355:GLY:N	2.49	0.41
1:A:616:ARG:NE	1:A:616:ARG:HA	2.36	0.41
1:A:766:THR:N	1:A:767:PRO:HD2	2.35	0.41
1:A:1071:LEU:HD11	2:A:2000:ANP:C6	2.51	0.41
1:A:766:THR:CG2	1:A:767:PRO:HD3	2.50	0.41
1:A:646:GLU:HA	1:A:649:GLN:HG3	2.02	0.41
1:A:967:ILE:HG23	1:A:968:ILE:N	2.36	0.41
1:A:1162:SER:OG	1:A:1165:VAL:HG12	2.21	0.41
1:A:1257:ASN:OD1	1:A:1258:LYS:N	2.53	0.41
1:A:836:GLY:O	1:A:877:ILE:HD11	2.20	0.41
1:A:1064:GLU:OE2	1:A:1076:THR:HG23	2.21	0.41
1:A:1167:ASP:O	1:A:1170:THR:OG1	2.30	0.41
1:A:1330:ILE:O	1:A:1334:VAL:HG13	2.21	0.41
1:A:570:ILE:HD11	1:A:627:PHE:CB	2.50	0.40
1:A:1206:VAL:HG23	1:A:1216:VAL:HG11	2.03	0.40
1:A:813:LEU:HD11	1:A:815:ILE:CD1	2.50	0.40
1:A:680:GLN:O	1:A:683:VAL:HG13	2.22	0.40
1:A:1053:LEU:O	1:A:1057:LEU:HD13	2.21	0.40
1:A:1057:LEU:HD23	1:A:1082:GLU:OE2	2.22	0.40
1:A:1045:LEU:N	1:A:1189:CYS:O	2.40	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	812/1507 (54%)	768 (95%)	44 (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	676/1258 (54%)	673 (100%)	3 (0%)	91	94

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	725	ARG
1	A	867	LYS
1	A	1055	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ANP	A	2000	-	29,33,33	3.74	13 (44%)	31,52,52	1.40	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	ANP	A	2000	-	-	8/14/38/38	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	2000	ANP	C2'-C3'	-11.19	1.22	1.53
2	A	2000	ANP	O4'-C1'	7.50	1.51	1.41
2	A	2000	ANP	O4'-C4'	-7.25	1.28	1.45
2	A	2000	ANP	PB-O3A	5.70	1.66	1.59
2	A	2000	ANP	C3'-C4'	5.65	1.67	1.53
2	A	2000	ANP	PG-O1G	3.72	1.52	1.46
2	A	2000	ANP	O2'-C2'	3.68	1.51	1.43
2	A	2000	ANP	C2'-C1'	3.57	1.59	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	2000	ANP	PB-O1B	3.57	1.51	1.46
2	A	2000	ANP	C6-N6	3.50	1.46	1.34
2	A	2000	ANP	PB-N3B	3.03	1.71	1.63
2	A	2000	ANP	O3'-C3'	2.52	1.48	1.43
2	A	2000	ANP	PG-N3B	2.45	1.69	1.63

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2000	ANP	N3-C2-N1	-4.57	121.53	128.68
2	A	2000	ANP	PB-O3A-PA	-2.80	122.75	132.62

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	2000	ANP	PB-N3B-PG-O1G
2	A	2000	ANP	PA-O3A-PB-O1B
2	A	2000	ANP	PA-O3A-PB-O2B
2	A	2000	ANP	C5'-O5'-PA-O2A
2	A	2000	ANP	O4'-C4'-C5'-O5'
2	A	2000	ANP	C3'-C4'-C5'-O5'
2	A	2000	ANP	C5'-O5'-PA-O3A
2	A	2000	ANP	C5'-O5'-PA-O1A

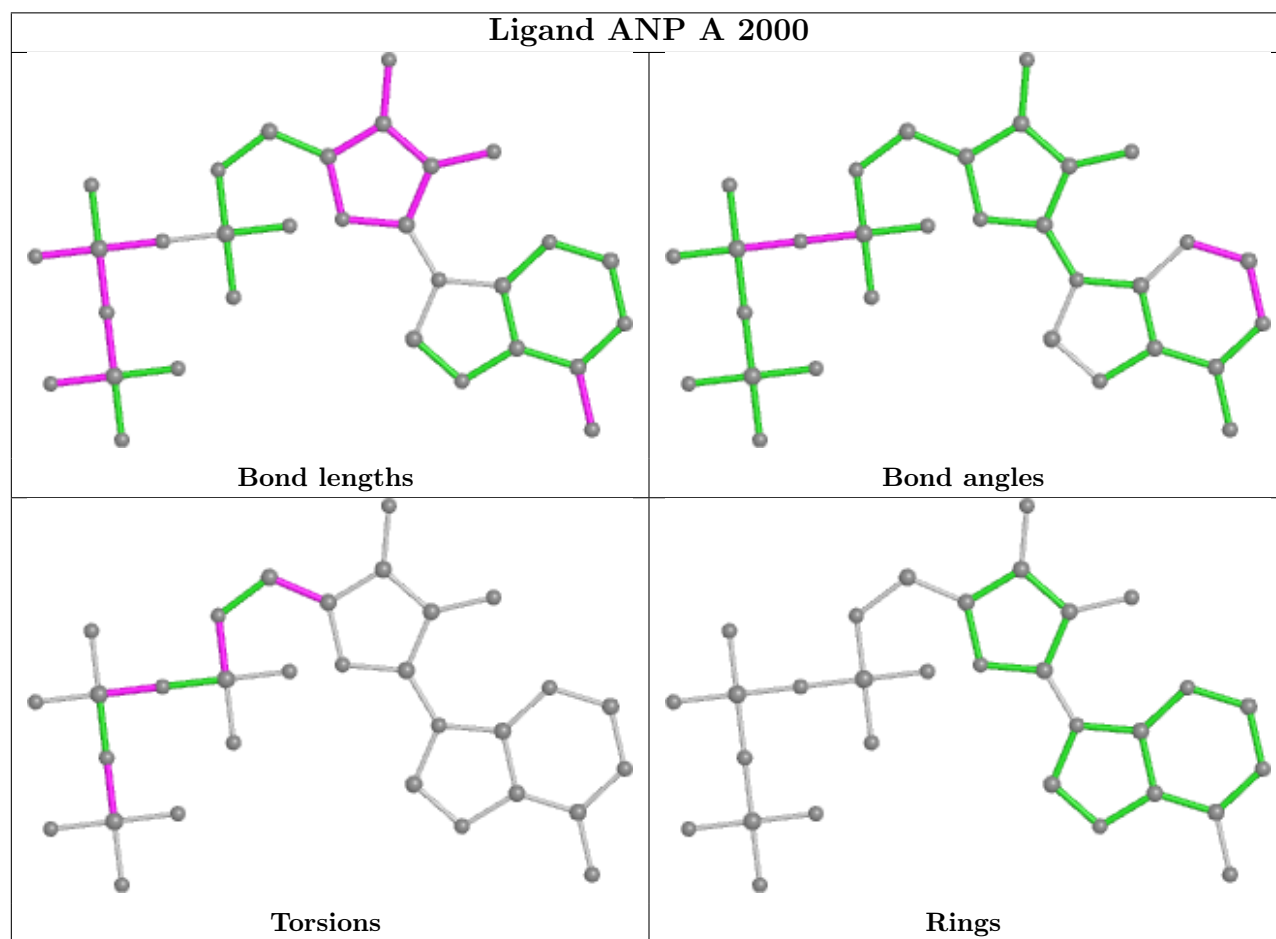
There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	2000	ANP	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

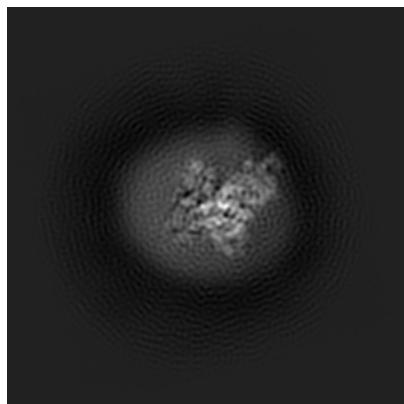
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35628. These allow visual inspection of the internal detail of the map and identification of artifacts.

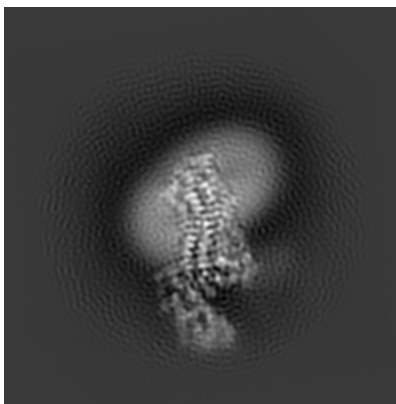
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

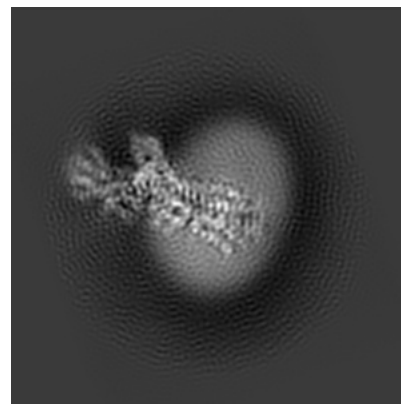
6.1.1 Primary map



X

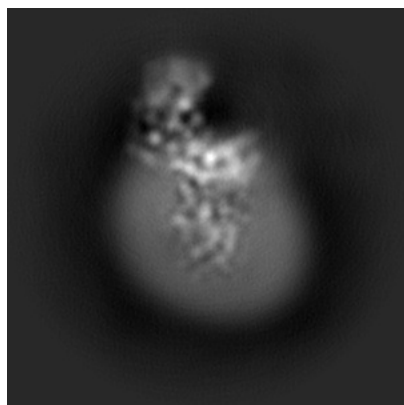


Y

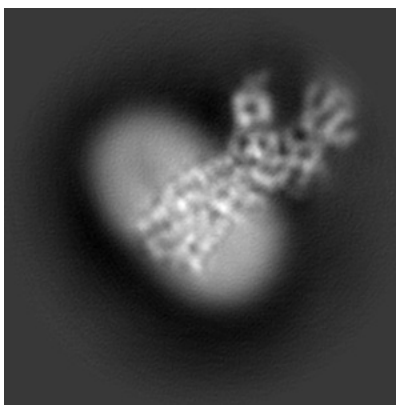


Z

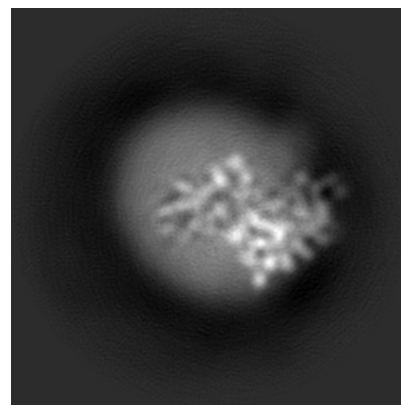
6.1.2 Raw map



X



Y

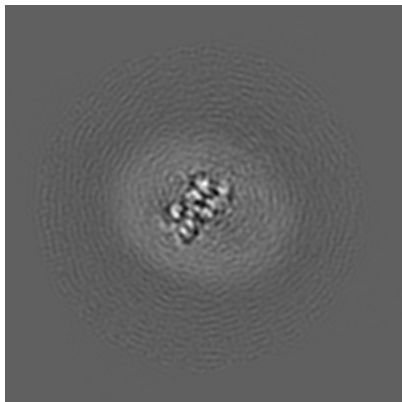


Z

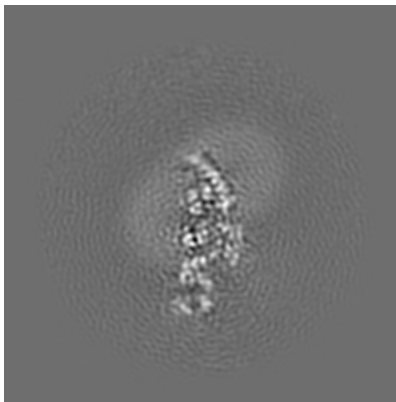
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

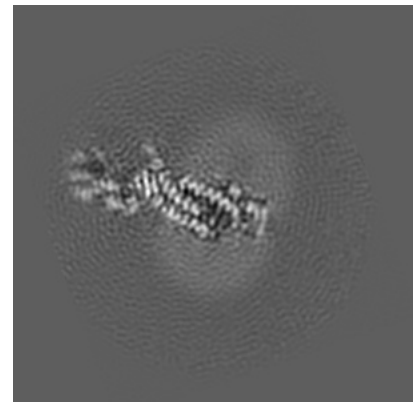
6.2.1 Primary map



X Index: 120

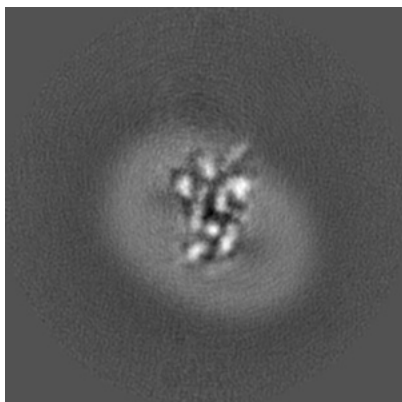


Y Index: 120

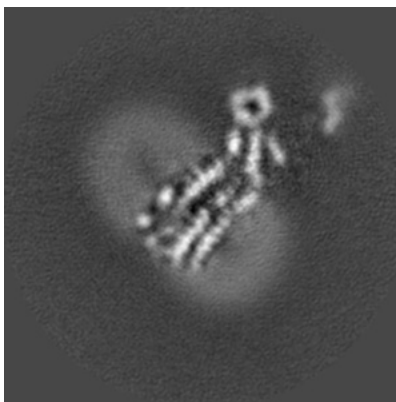


Z Index: 120

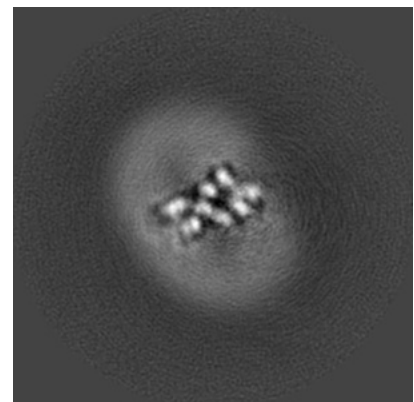
6.2.2 Raw map



X Index: 105



Y Index: 105

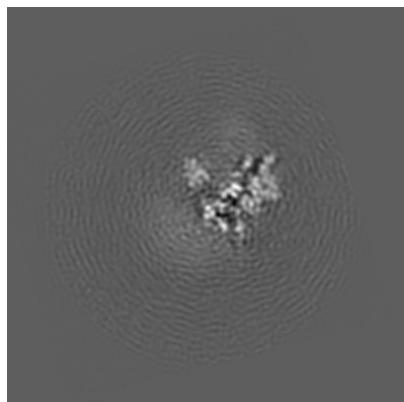


Z Index: 105

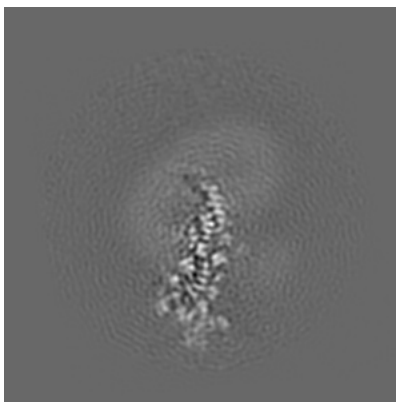
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

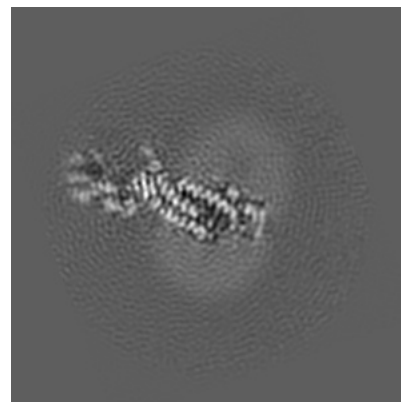
6.3.1 Primary map



X Index: 86

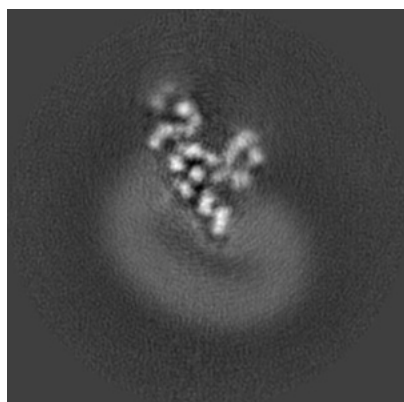


Y Index: 130

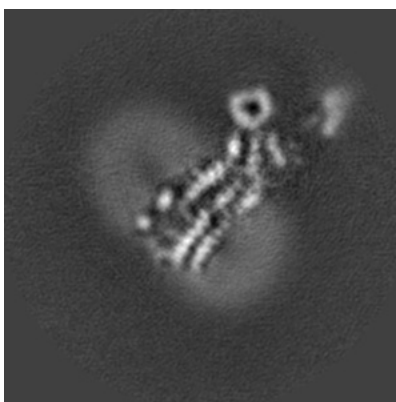


Z Index: 120

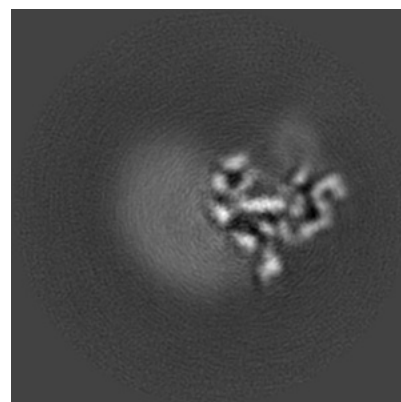
6.3.2 Raw map



X Index: 121



Y Index: 104

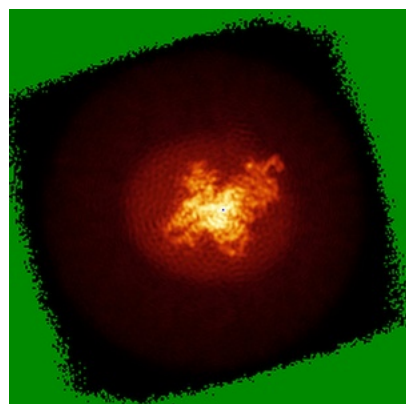


Z Index: 130

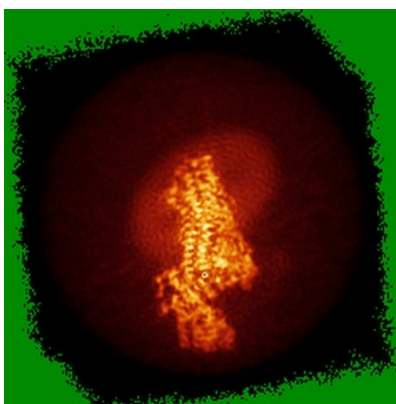
The images above show the largest variance slices of the map in three orthogonal directions.

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

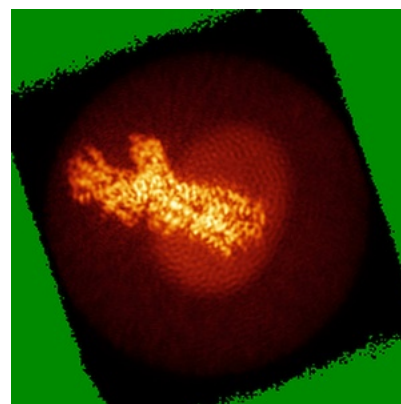
6.4.1 Primary map



X

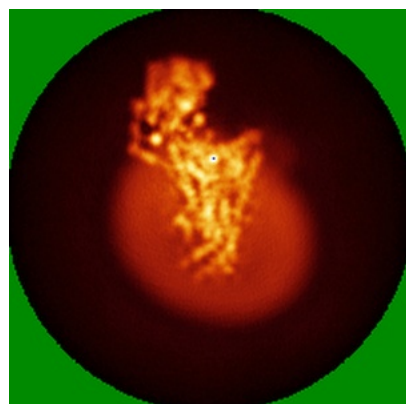


Y

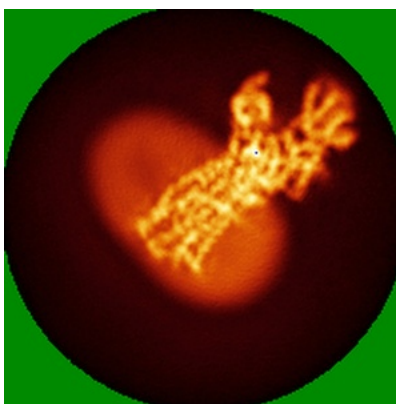


Z

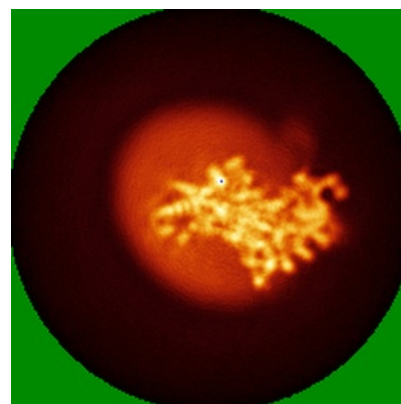
6.4.2 Raw map



X



Y

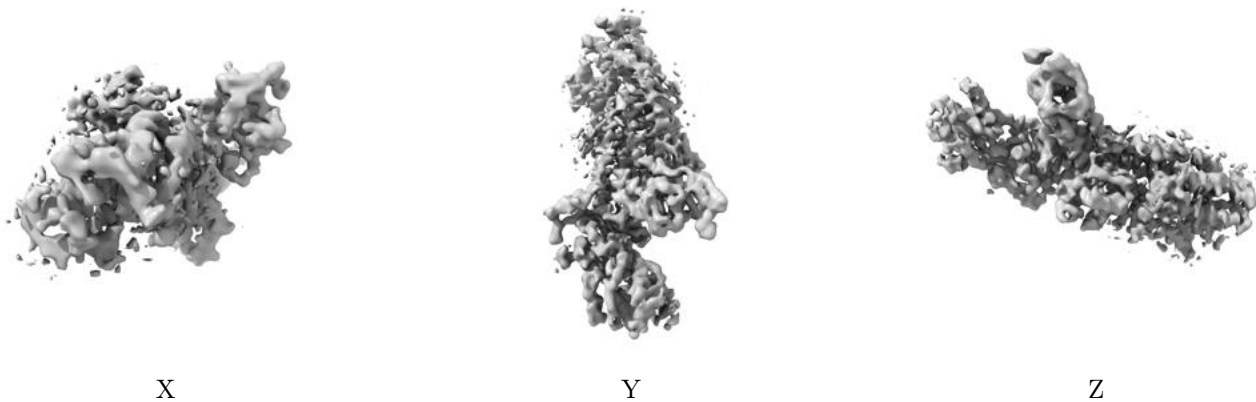


Z

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.

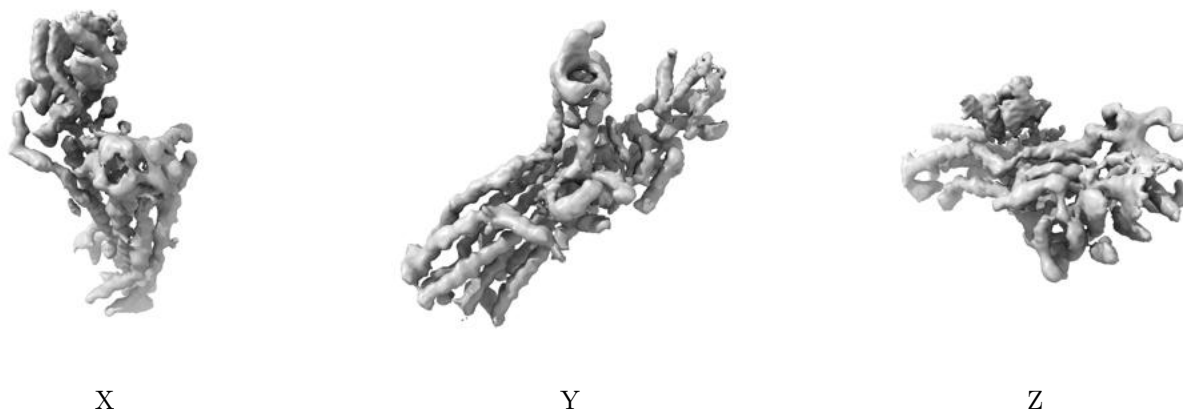
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.015. 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.

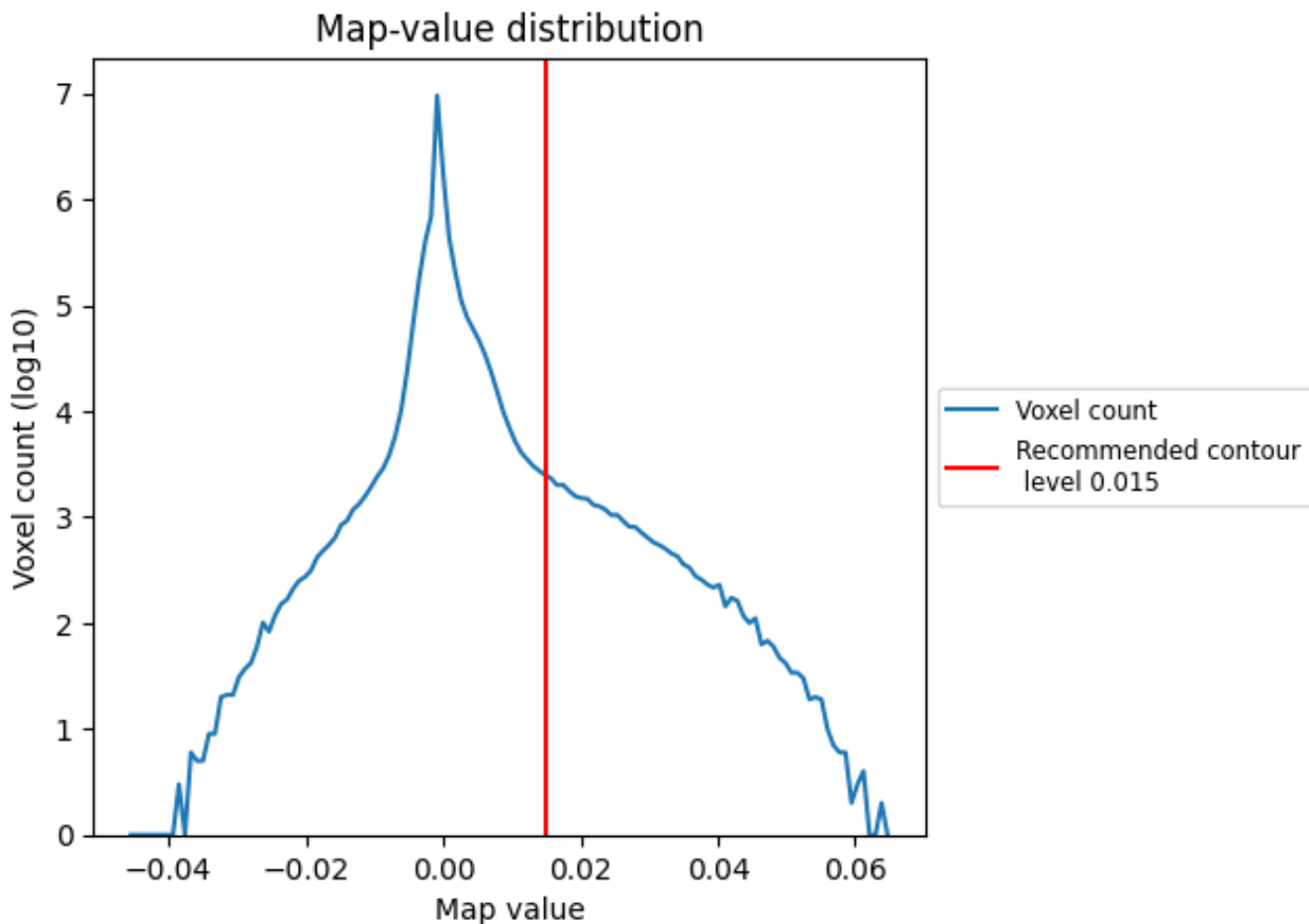
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

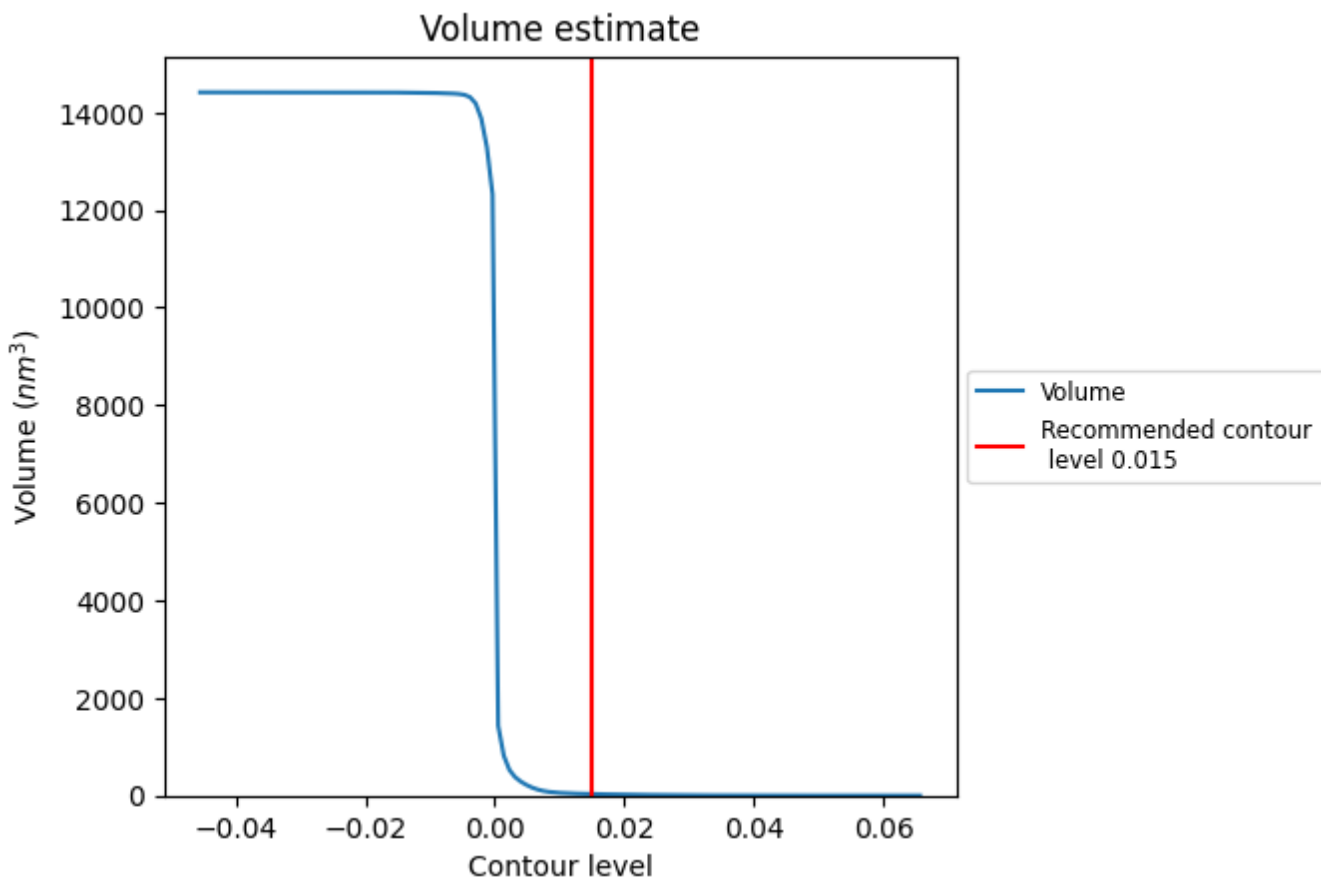
This section contains the results of statistical analysis of the map.

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.

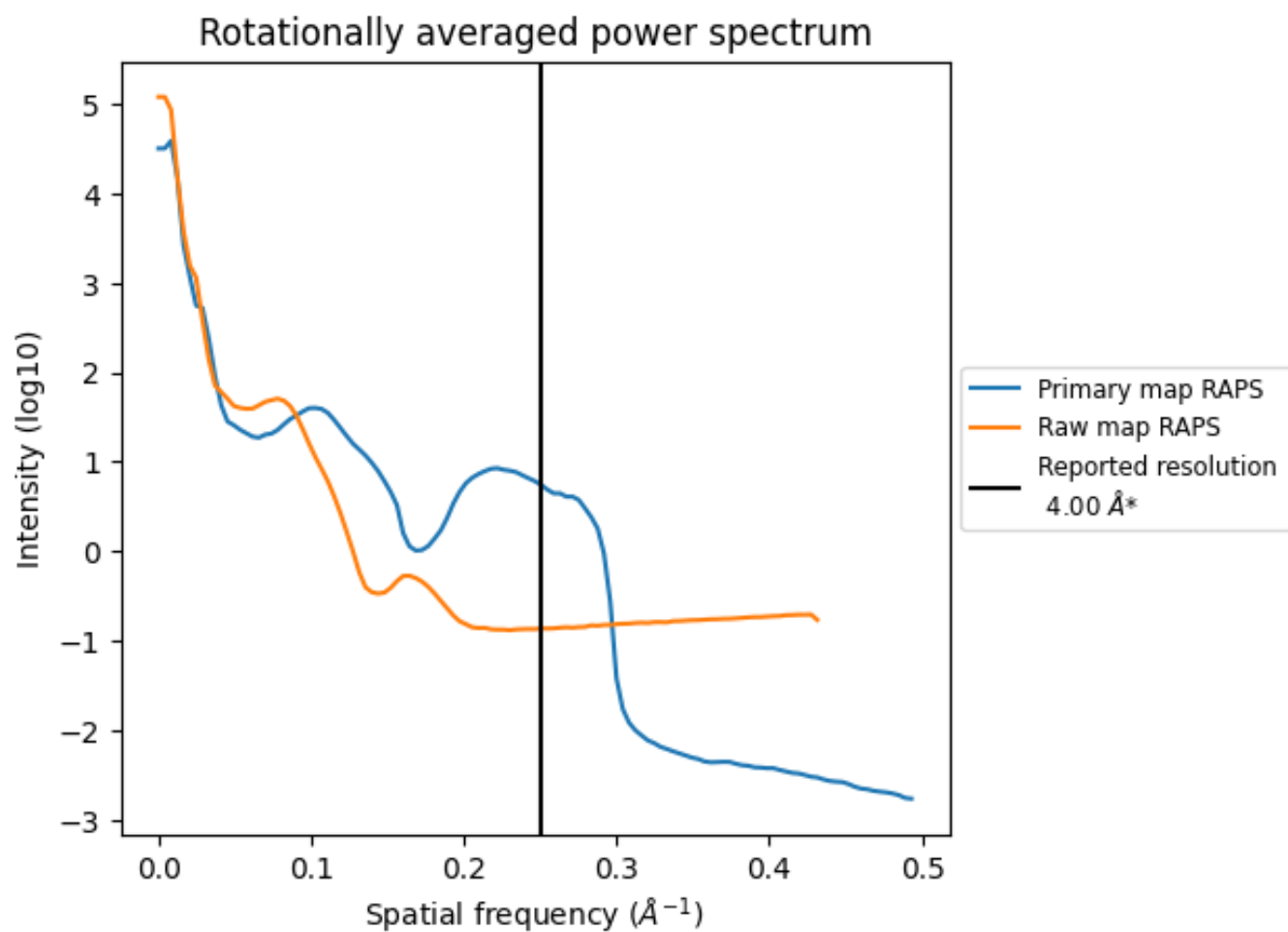
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 32 nm³; this corresponds to an approximate mass of 29 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

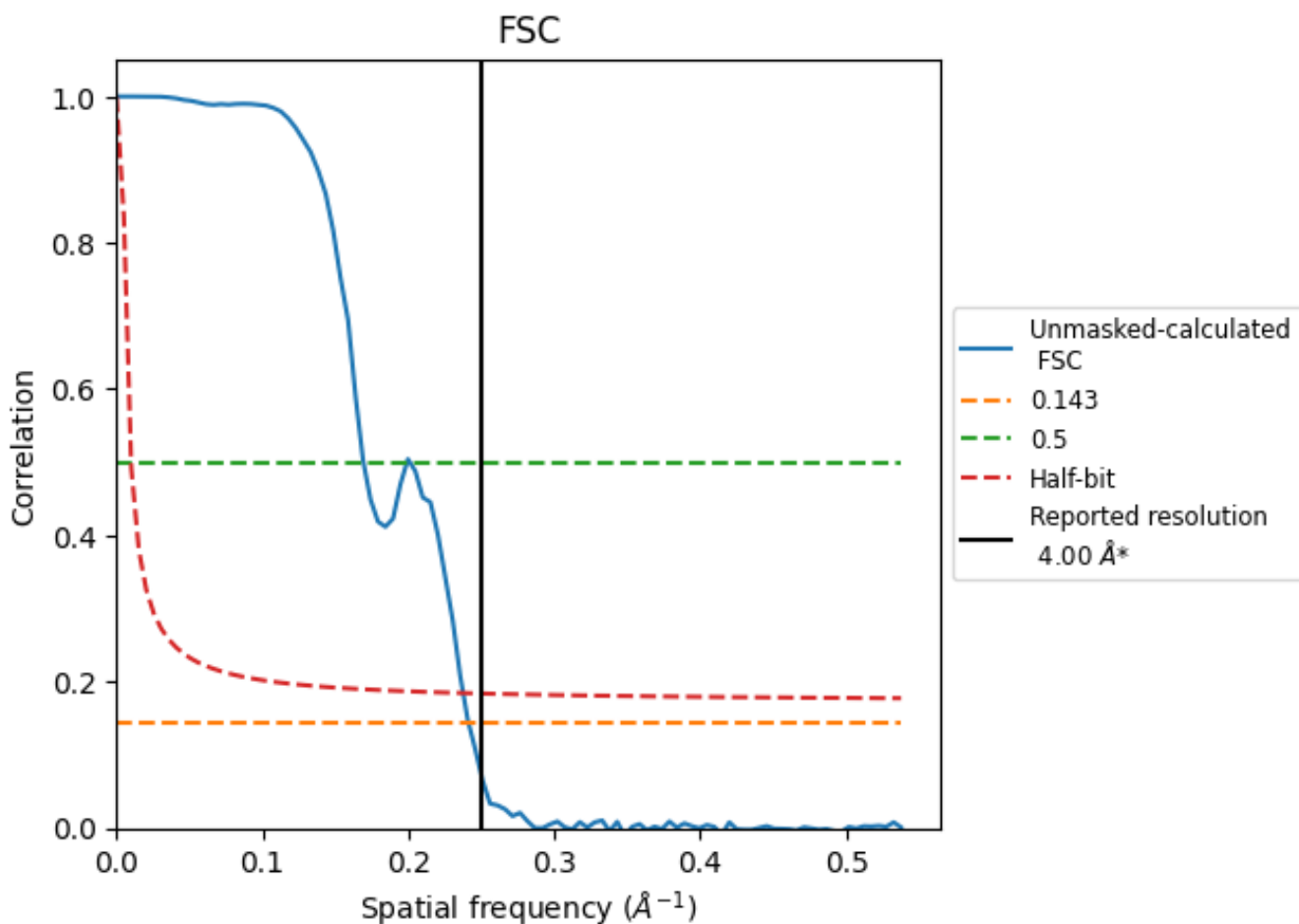


*Reported resolution corresponds to spatial frequency of 0.250 Å⁻¹

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 0.250 Å⁻¹

8.2 Resolution estimates [i](#)

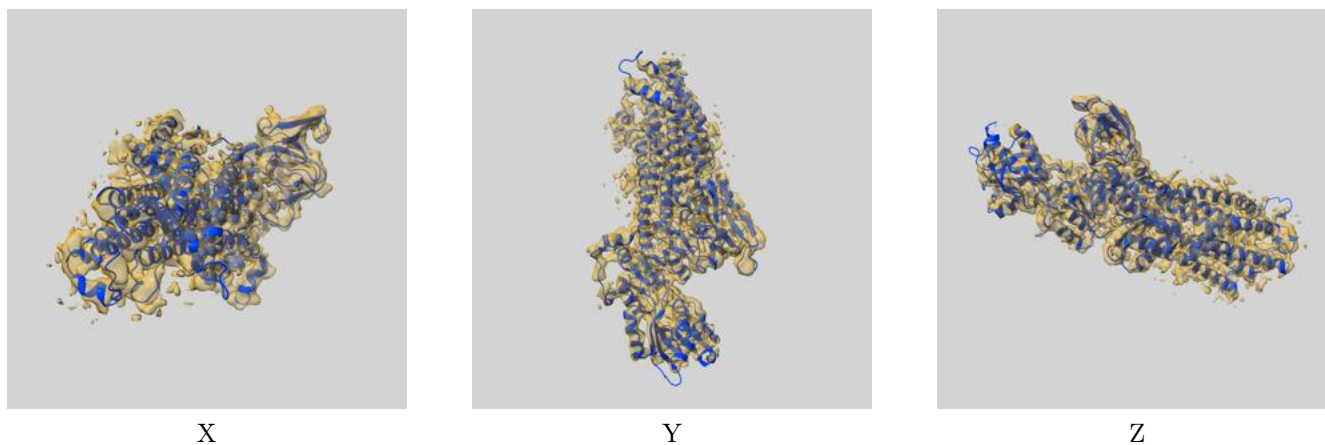
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.14	5.91	4.21

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

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-35628 and PDB model 8IOY. Per-residue inclusion information can be found in section [3](#) on page [5](#).

9.1 Map-model overlay [i](#)



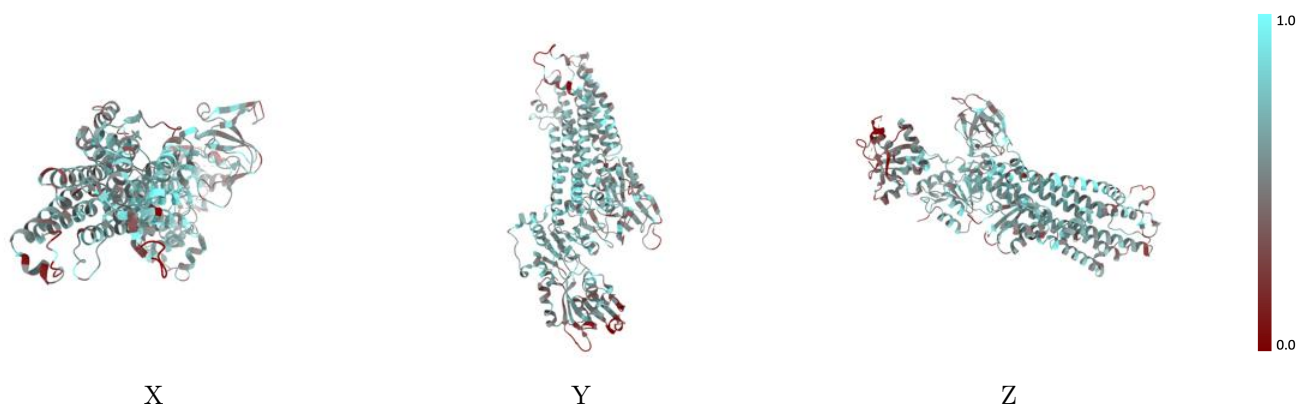
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



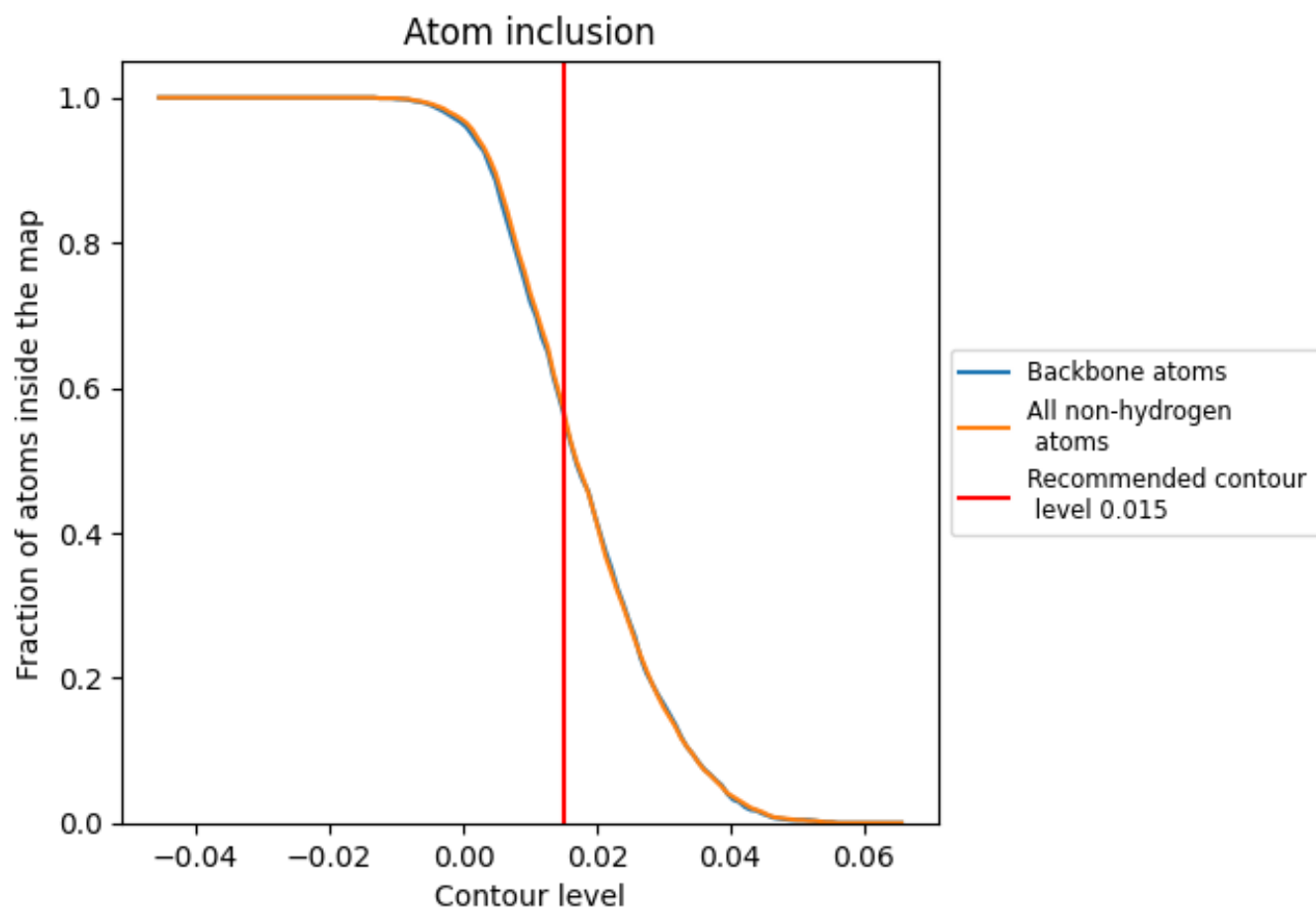
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.015).





9.4 Atom inclusion [i](#)



At the recommended contour level, 57% of all backbone atoms, 57% 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 (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5710	 0.3810
A	 0.5720	 0.3810

