



Full wwPDB EM Validation Report ⓘ

Jul 19, 2026 – 08:22 pm BST

PDB ID : 9THI / pdb_00009thi
EMDB ID : EMD-55928
Title : OmRV Crown Protein Deletion mutant infectious clone
Authors : Wang, H.; Okamoto, K.
Deposited on : 2025-12-03
Resolution : 2.90 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.dev133
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

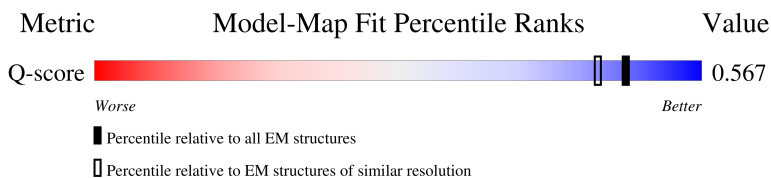
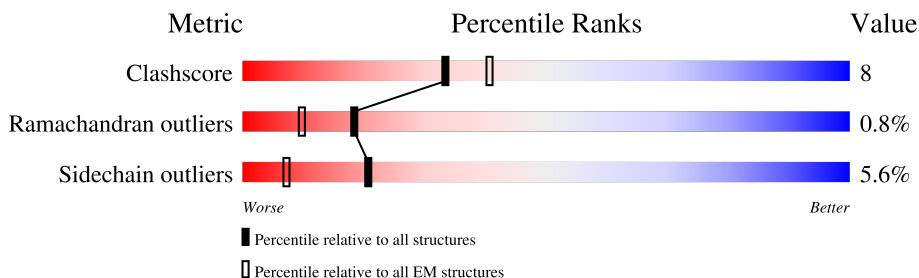
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13054 (2.40 - 3.40)

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	1685	
1	B	1685	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 13177 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 Omono River Virus AK4 strain Subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	849	Total	C	N	O	S	0	0
			6488	4113	1112	1234	29		
1	B	878	Total	C	N	O	S	0	0
			6689	4237	1145	1277	30		



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	12488	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	29.57	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	20000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	5.483	Depositor
Minimum map value	-3.100	Depositor
Average map value	0.037	Depositor
Map value standard deviation	0.244	Depositor
Recommended contour level	0.7329	Depositor
Map size (Å)	571.2, 571.2, 571.2	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.952, 0.952, 0.952	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.24	0/6644	0.57	8/9088 (0.1%)
1	B	0.23	0/6849	0.53	5/9373 (0.1%)
All	All	0.24	0/13493	0.55	13/18461 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	1
All	All	0	3

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	920	GLN	N-CA-CB	-8.10	101.03	110.35
1	B	1652	ASP	N-CA-C	-7.85	104.22	113.88
1	A	914	ASP	CB-CA-C	-7.72	99.36	111.17
1	B	1124	THR	CA-C-N	7.45	135.76	121.54
1	B	1124	THR	C-N-CA	7.45	135.76	121.54
1	B	1651	THR	N-CA-C	-7.30	103.69	112.59
1	A	916	VAL	N-CA-CB	7.21	118.98	110.55
1	A	917	LYS	N-CA-CB	-6.10	101.14	109.98
1	A	918	ASN	CB-CA-C	6.09	122.33	110.57
1	A	923	THR	N-CA-C	-6.02	104.37	113.89
1	B	1653	LEU	N-CA-CB	-5.87	100.12	110.39
1	A	942	ILE	N-CA-C	-5.84	107.17	111.90
1	A	926	ARG	N-CA-C	5.77	118.31	111.33

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	925	ARG	Sidechain
1	A	926	ARG	Sidechain
1	B	1256	PHE	Peptide

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	6488	0	6358	118	0
1	B	6689	0	6565	105	0
All	All	13177	0	12923	217	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 8.

All (217) 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:1376:LEU:O	1:A:1380:MET:HB2	1.74	0.86
1:B:1124:THR:O	1:B:1125:THR:HG22	1.82	0.79
1:A:1465:GLN:HB3	1:A:1503:MET:HE1	1.66	0.75
1:B:1063:LEU:HB3	1:B:1182:PHE:CE1	2.24	0.72
1:A:1220:LYS:HD2	1:A:1415:TYR:HE2	1.55	0.70
1:B:1325:TYR:HD2	1:B:1427:PRO:HG2	1.58	0.69
1:A:1131:ALA:HA	1:A:1158:MET:HE2	1.75	0.69
1:B:1564:PRO:HB2	1:B:1573:ILE:HG21	1.75	0.68
1:A:1564:PRO:HB2	1:A:1573:ILE:HG21	1.76	0.67
1:B:1272:ASP:HB3	1:B:1275:THR:HG22	1.76	0.67
1:B:888:LEU:HD21	1:B:1101:THR:HG21	1.77	0.66
1:B:969:MET:HE1	1:B:980:GLN:HE22	1.60	0.66
1:A:1132:MET:HE3	1:A:1137:PRO:HD2	1.79	0.65
1:B:962:LEU:HG	1:B:1099:GLN:HB3	1.77	0.65
1:A:790:ILE:HD11	1:A:1603:SER:HB3	1.78	0.64
1:B:1115:PRO:HG2	1:B:1134:MET:HE2	1.80	0.64
1:A:1040:LYS:HG3	1:B:924:TRP:HE1	1.62	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1432:ASP:HB2	1:B:1559:ALA:HA	1.80	0.63
1:A:1188:ARG:HE	1:A:1302:GLY:HA3	1.64	0.63
1:B:899:TYR:HD2	1:B:1673:GLN:HG3	1.64	0.63
1:A:1399:ILE:HD11	1:A:1404:ARG:HD2	1.81	0.63
1:A:920:GLN:O	1:A:922:SER:N	2.31	0.63
1:A:1480:PRO:HG3	1:A:1511:TRP:CG	2.34	0.62
1:A:849:ASN:HB2	1:A:1601:LEU:HB2	1.82	0.62
1:A:1212:VAL:HG22	1:A:1310:GLU:HG2	1.82	0.62
1:A:1355:PHE:CD2	1:A:1407:PRO:HA	2.35	0.61
1:A:943:ASN:HB2	1:A:1283:LEU:HD22	1.82	0.61
1:A:1408:GLY:HA3	1:B:1054:THR:HB	1.81	0.61
1:A:888:LEU:HD21	1:A:1101:THR:HG21	1.83	0.61
1:B:803:PHE:CE1	1:B:1327:SER:HB3	2.35	0.61
1:A:1323:MET:HE2	1:A:1323:MET:HA	1.84	0.60
1:A:1488:ASN:HB2	1:A:1572:ARG:HH21	1.67	0.60
1:A:1363:THR:HG23	1:A:1364:ILE:H	1.67	0.60
1:A:1442:LEU:HD12	1:A:1443:PRO:HD2	1.84	0.60
1:B:908:LEU:HD11	1:B:931:LEU:HD21	1.84	0.60
1:B:979:SER:HB2	1:B:1311:ARG:HH12	1.67	0.59
1:B:1527:ILE:HD12	1:B:1529:GLU:HB2	1.83	0.59
1:B:1353:ASN:O	1:B:1369:TYR:HB2	2.02	0.58
1:B:1026:ILE:HB	1:B:1171:LEU:HD13	1.84	0.58
1:B:866:PRO:HG2	1:B:1430:ILE:HG22	1.85	0.58
1:B:1323:MET:HG3	1:B:1380:MET:HE1	1.85	0.57
1:A:1026:ILE:HD11	1:A:1112:LEU:HD22	1.86	0.57
1:B:897:GLU:HG2	1:B:1270:ASP:HB3	1.86	0.56
1:B:1058:ASN:HD21	1:B:1138:GLN:H	1.52	0.56
1:B:893:THR:HG22	1:B:1103:HIS:O	2.05	0.56
1:B:873:ARG:HD3	1:B:1096:ILE:HD12	1.88	0.56
1:A:1126:LEU:HA	1:A:1158:MET:SD	2.46	0.56
1:A:1211:ASN:O	1:A:1215:SER:HB3	2.06	0.55
1:B:850:GLN:HG2	1:B:1556:THR:HG21	1.89	0.55
1:B:1015:PRO:HG2	1:B:1173:SER:HA	1.87	0.55
1:A:1047:PRO:HG3	1:A:1280:ALA:HB1	1.87	0.55
1:A:981:TYR:HB2	1:A:990:PRO:HG3	1.89	0.55
1:A:1030:VAL:HG11	1:A:1131:ALA:HB3	1.89	0.55
1:A:1401:HIS:HA	1:A:1404:ARG:HD3	1.89	0.55
1:B:1144:THR:HB	1:B:1150:LEU:HB2	1.89	0.54
1:A:1325:TYR:HD2	1:A:1427:PRO:HG2	1.73	0.54
1:B:1306:THR:O	1:B:1310:GLU:HG3	2.08	0.54
1:B:1331:THR:HG21	1:B:1529:GLU:HG2	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:903:ILE:HD13	1:A:1275:THR:HG23	1.89	0.54
1:A:1026:ILE:HD13	1:A:1110:LEU:HB3	1.90	0.54
1:B:951:LEU:HD13	1:B:1275:THR:HG23	1.90	0.54
1:B:1459:LYS:HD3	1:B:1591:ARG:HG3	1.90	0.54
1:A:1334:ALA:HB1	1:A:1347:LEU:HD21	1.89	0.53
1:A:1527:ILE:HD12	1:A:1529:GLU:HB2	1.90	0.53
1:B:1308:PHE:O	1:B:1312:LEU:HG	2.08	0.53
1:A:814:LEU:HB2	1:A:1384:ALA:HB2	1.90	0.53
1:A:1261:GLN:HG3	1:B:1117:ARG:HH12	1.73	0.53
1:B:1221:MET:HB2	1:B:1414:VAL:HG12	1.91	0.53
1:B:1369:TYR:HA	1:B:1372:ILE:HD13	1.91	0.53
1:B:845:ARG:HD3	1:B:862:VAL:HG13	1.92	0.52
1:B:1144:THR:HG21	1:B:1173:SER:HB3	1.90	0.52
1:B:814:LEU:HB2	1:B:1384:ALA:HB2	1.90	0.52
1:A:1220:LYS:HD2	1:A:1415:TYR:CE2	2.41	0.52
1:A:1355:PHE:HD2	1:A:1407:PRO:HA	1.74	0.52
1:B:1425:PHE:HB3	1:B:1562:CYS:HB2	1.91	0.52
1:A:1028:PHE:HE1	1:A:1061:LEU:HD11	1.75	0.51
1:A:1582:SER:O	1:A:1586:VAL:HG23	2.09	0.51
1:A:970:ASN:O	1:A:970:ASN:ND2	2.35	0.51
1:B:1122:ASN:HB3	1:B:1161:ILE:HD11	1.92	0.51
1:B:1512:MET:HE2	1:B:1563:VAL:HG22	1.92	0.51
1:A:917:LYS:HB2	1:B:1656:VAL:HG12	1.93	0.51
1:A:1309:TRP:O	1:A:1313:GLN:HB2	2.11	0.51
1:B:1275:THR:HA	1:B:1278:LYS:HG3	1.93	0.50
1:B:1137:PRO:HD2	1:B:1158:MET:HE1	1.93	0.50
1:A:892:GLU:HB2	1:A:1262:PRO:HG2	1.92	0.50
1:B:867:PHE:CD1	1:B:1218:ALA:HB2	2.46	0.50
1:B:1102:ILE:HG22	1:B:1104:ILE:HG13	1.93	0.50
1:A:1116:ARG:HH22	1:A:1122:ASN:HA	1.77	0.50
1:B:1063:LEU:HD11	1:B:1190:TYR:CD1	2.47	0.49
1:A:803:PHE:CZ	1:A:1376:LEU:HD11	2.47	0.49
1:B:954:GLU:HG2	1:B:1269:TYR:HB2	1.92	0.49
1:B:1457:SER:HB3	1:B:1594:ASN:HB3	1.93	0.49
1:A:829:ILE:HD13	1:A:847:ARG:O	2.12	0.49
1:A:1013:ASN:O	1:A:1015:PRO:HD3	2.12	0.49
1:A:1110:LEU:HD12	1:A:1171:LEU:HD21	1.95	0.49
1:B:1066:LEU:HD12	1:B:1175:LEU:HD13	1.94	0.49
1:A:914:ASP:HA	1:A:917:LYS:HD3	1.93	0.49
1:A:1553:ILE:HG13	1:A:1554:GLU:H	1.78	0.49
1:B:1444:LEU:HB3	1:B:1502:ASP:HB3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:970:ASN:HD22	1:A:970:ASN:C	2.19	0.48
1:B:870:LEU:HD22	1:B:1078:VAL:HG21	1.95	0.48
1:B:1445:PHE:HB2	1:B:1505:THR:HB	1.94	0.48
1:A:1554:GLU:O	1:A:1554:GLU:HG2	2.14	0.48
1:A:865:ILE:HD13	1:A:1312:LEU:HD21	1.96	0.48
1:A:898:TYR:CG	1:A:952:SER:HB3	2.49	0.48
1:A:1099:GLN:HG3	1:A:1215:SER:HB2	1.96	0.48
1:A:1364:ILE:HG23	1:A:1364:ILE:O	2.12	0.48
1:A:1261:GLN:HG3	1:B:1117:ARG:NH1	2.29	0.48
1:A:1399:ILE:HD11	1:A:1404:ARG:HH11	1.78	0.48
1:A:1481:TYR:HE1	1:A:1586:VAL:HG13	1.78	0.48
1:B:1243:TYR:CZ	1:B:1249:VAL:HG22	2.49	0.48
1:A:848:GLY:HA3	1:A:1602:LEU:HD21	1.95	0.48
1:B:1345:LYS:N	1:B:1345:LYS:HD3	2.29	0.47
1:B:1527:ILE:HG21	1:B:1573:ILE:HD13	1.95	0.47
1:A:920:GLN:C	1:A:922:SER:H	2.23	0.47
1:B:1330:ILE:HA	1:B:1566:TYR:HB3	1.97	0.47
1:A:1331:THR:HG23	1:A:1334:ALA:H	1.80	0.47
1:B:1308:PHE:CE2	1:B:1312:LEU:HD11	2.50	0.46
1:A:1266:MET:HG3	1:A:1404:ARG:O	2.15	0.46
1:B:1381:PHE:CE1	1:B:1439:THR:HG22	2.50	0.46
1:B:1319:ILE:HG12	1:B:1435:CYS:HA	1.96	0.46
1:B:1210:LEU:O	1:B:1214:LEU:HD12	2.16	0.46
1:B:1218:ALA:HB3	1:B:1429:LEU:HD21	1.98	0.46
1:A:1069:SER:HB2	1:A:1171:LEU:HD21	1.98	0.46
1:A:1366:PRO:HB3	1:A:1399:ILE:HB	1.98	0.46
1:B:1028:PHE:HB2	1:B:1156:PHE:CE2	2.51	0.46
1:A:1194:LEU:HB3	1:A:1200:VAL:HG11	1.97	0.45
1:A:1363:THR:O	1:A:1364:ILE:HB	2.15	0.45
1:B:980:GLN:HG3	1:B:1311:ARG:NH1	2.31	0.45
1:A:865:ILE:HG23	1:A:1315:ILE:HD11	1.99	0.45
1:A:1015:PRO:HB2	1:A:1172:THR:HB	1.98	0.45
1:B:1191:MET:HE3	1:B:1191:MET:HB3	1.86	0.45
1:B:1217:VAL:HG22	1:B:1241:VAL:HB	1.98	0.45
1:B:1485:PHE:HZ	1:B:1574:PHE:CE1	2.34	0.45
1:A:1053:ALA:HA	1:A:1193:ARG:HG2	1.99	0.45
1:A:1467:LEU:HB2	1:A:1481:TYR:HB3	1.98	0.45
1:A:1205:TRP:HA	1:A:1205:TRP:CE3	2.51	0.45
1:A:868:THR:HB	1:A:983:VAL:HG21	1.99	0.45
1:B:1467:LEU:HB2	1:B:1481:TYR:HB3	1.98	0.45
1:A:970:ASN:HB2	1:A:998:VAL:HG23	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1359:GLN:HG2	1:A:1361:VAL:HG22	1.99	0.45
1:A:1413:ASN:ND2	1:A:1421:VAL:HG13	2.32	0.45
1:B:794:PHE:HE1	1:B:1591:ARG:HH21	1.64	0.45
1:A:873:ARG:HD3	1:A:888:LEU:HD12	1.98	0.44
1:A:920:GLN:C	1:A:922:SER:N	2.75	0.44
1:A:957:LEU:HD22	1:A:1191:MET:HE1	1.99	0.44
1:B:969:MET:HE1	1:B:980:GLN:NE2	2.31	0.44
1:A:1511:TRP:CE3	1:A:1577:LEU:HD12	2.52	0.44
1:A:1480:PRO:HG3	1:A:1511:TRP:CD2	2.52	0.44
1:A:1328:ARG:HD3	1:B:1622:PHE:CZ	2.53	0.44
1:A:1505:THR:O	1:A:1509:ARG:HG3	2.18	0.44
1:A:873:ARG:HG3	1:A:1096:ILE:HD12	2.00	0.43
1:B:1436:GLN:HA	1:B:1442:LEU:HD13	2.00	0.43
1:B:1322:THR:HG23	1:B:1326:HIS:CE1	2.53	0.43
1:A:1008:GLU:O	1:A:1075:LEU:HD12	2.18	0.43
1:B:980:GLN:HG3	1:B:1311:ARG:HD2	2.00	0.43
1:A:829:ILE:HG12	1:A:1602:LEU:HD22	2.00	0.43
1:A:920:GLN:O	1:A:923:THR:OG1	2.36	0.43
1:B:1198:VAL:HG23	1:B:1289:LEU:HB3	1.99	0.43
1:A:1425:PHE:CZ	1:A:1532:PRO:HG3	2.53	0.43
1:B:1154:GLN:HG2	1:B:1169:TRP:HZ2	1.83	0.43
1:A:890:ILE:HG21	1:A:1258:LEU:HD11	1.99	0.43
1:A:1066:LEU:HD12	1:A:1175:LEU:HD13	2.01	0.43
1:A:792:ALA:HA	1:A:1605:VAL:HG22	2.01	0.43
1:A:911:MET:O	1:A:915:GLN:HG3	2.17	0.43
1:A:1057:ALA:HB3	1:A:1135:VAL:HG21	2.01	0.43
1:A:917:LYS:C	1:A:919:ASN:H	2.25	0.43
1:B:794:PHE:O	1:B:798:GLU:HG3	2.18	0.43
1:B:1315:ILE:O	1:B:1319:ILE:HD12	2.19	0.43
1:A:1498:PRO:HD3	1:A:1566:TYR:CD2	2.54	0.43
1:B:1047:PRO:HG2	1:B:1050:ILE:HG23	2.00	0.43
1:B:1485:PHE:HZ	1:B:1574:PHE:HE1	1.65	0.43
1:A:1054:THR:HG22	1:A:1055:SER:O	2.19	0.42
1:A:1470:HIS:HB3	1:A:1479:ALA:HB3	2.01	0.42
1:B:1023:THR:HG22	1:B:1170:PRO:HB3	2.01	0.42
1:B:895:VAL:HG21	1:B:1105:GLY:N	2.35	0.42
1:B:1486:ALA:C	1:B:1488:ASN:H	2.27	0.42
1:A:1245:SER:HA	1:A:1321:TRP:CD1	2.54	0.42
1:B:873:ARG:CD	1:B:1096:ILE:HD12	2.49	0.42
1:B:1414:VAL:HG23	1:B:1422:VAL:HB	2.02	0.42
1:A:1063:LEU:HD13	1:A:1182:PHE:CD1	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1457:SER:HB3	1:A:1594:ASN:HB3	2.02	0.42
1:B:1223:THR:HB	1:B:1536:GLU:HB2	2.01	0.42
1:A:1436:GLN:H	1:A:1436:GLN:HG2	1.75	0.42
1:A:1028:PHE:CE1	1:A:1061:LEU:HD11	2.54	0.42
1:B:1204:TYR:HD2	1:B:1298:PRO:HG2	1.85	0.41
1:B:1025:ALA:HB3	1:B:1109:VAL:HG22	2.02	0.41
1:B:1132:MET:HE3	1:B:1132:MET:HB2	1.74	0.41
1:B:1331:THR:HG22	1:B:1333:LEU:H	1.85	0.41
1:B:1361:VAL:HG23	1:B:1362:GLY:N	2.35	0.41
1:A:1227:GLY:O	1:A:1228:TRP:CD1	2.73	0.41
1:B:867:PHE:HE2	1:B:1315:ILE:HA	1.84	0.41
1:B:1648:LYS:O	1:B:1650:LEU:N	2.53	0.41
1:B:1330:ILE:HD11	1:B:1346:TRP:HH2	1.85	0.41
1:A:893:THR:HG22	1:A:1268:VAL:HG12	2.03	0.41
1:A:967:LYS:HG2	1:A:1182:PHE:O	2.20	0.41
1:A:1003:SER:HA	1:A:1004:PRO:HD3	1.94	0.41
1:A:1330:ILE:HA	1:A:1566:TYR:HB3	2.02	0.41
1:A:1330:ILE:HD11	1:A:1346:TRP:CH2	2.55	0.41
1:B:1196:THR:O	1:B:1291:PRO:HB3	2.21	0.41
1:B:1307:SER:O	1:B:1311:ARG:HG3	2.21	0.41
1:A:1272:ASP:OD2	1:A:1272:ASP:C	2.63	0.41
1:B:958:LEU:O	1:B:962:LEU:HD13	2.20	0.41
1:B:1604:ASN:OD1	1:B:1604:ASN:O	2.38	0.41
1:B:918:ASN:OD1	1:B:1656:VAL:HG23	2.21	0.41
1:A:871:ILE:HD11	1:A:1098:THR:HG22	2.03	0.40
1:B:865:ILE:HA	1:B:866:PRO:HD3	1.93	0.40
1:B:1154:GLN:HG2	1:B:1169:TRP:CZ2	2.56	0.40
1:A:795:SER:O	1:A:799:ASN:HB2	2.22	0.40
1:A:917:LYS:NZ	1:A:918:ASN:HB2	2.36	0.40
1:B:822:ILE:HG12	1:B:1438:PHE:CD1	2.57	0.40
1:B:1070:GLU:HG3	1:B:1105:GLY:O	2.21	0.40
1:A:1319:ILE:HG12	1:A:1435:CYS:HA	2.02	0.40
1:A:1017:TYR:HE2	1:A:1108:ARG:HB3	1.86	0.40
1:A:1194:LEU:HD13	1:A:1194:LEU:HA	1.93	0.40
1:A:1228:TRP:CD1	1:A:1228:TRP:C	2.99	0.40
1:A:1567:SER:HB2	1:A:1573:ILE:HD11	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	845/1685 (50%)	776 (92%)	61 (7%)	8 (1%)	14	41
1	B	874/1685 (52%)	798 (91%)	71 (8%)	5 (1%)	21	51
All	All	1719/3370 (51%)	1574 (92%)	132 (8%)	13 (1%)	18	44

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	921	PHE
1	A	1233	ALA
1	A	1338	ALA
1	A	1364	ILE
1	B	1257	PRO
1	A	1143	ALA
1	A	1360	SER
1	B	1168	GLU
1	B	1650	LEU
1	B	1361	VAL
1	A	1471	ARG
1	B	1118	GLU
1	A	1163	ALA

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	691/1408 (49%)	653 (94%)	38 (6%)	19	50

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	717/1408 (51%)	676 (94%)	41 (6%)	18	49
All	All	1408/2816 (50%)	1329 (94%)	79 (6%)	21	50

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	796	GLU
1	A	830	VAL
1	A	832	ASP
1	A	893	THR
1	A	912	ILE
1	A	916	VAL
1	A	917	LYS
1	A	922	SER
1	A	923	THR
1	A	927	ASP
1	A	963	LEU
1	A	970	ASN
1	A	980	GLN
1	A	988	THR
1	A	992	ILE
1	A	1035	VAL
1	A	1061	LEU
1	A	1100	SER
1	A	1112	LEU
1	A	1134	MET
1	A	1228	TRP
1	A	1279	VAL
1	A	1283	LEU
1	A	1306	THR
1	A	1315	ILE
1	A	1339	TYR
1	A	1372	ILE
1	A	1376	LEU
1	A	1380	MET
1	A	1395	LYS
1	A	1399	ILE
1	A	1400	THR
1	A	1410	THR
1	A	1416	SER
1	A	1424	CYS
1	A	1439	THR

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Mol	Chain	Res	Type
1	A	1488	ASN
1	A	1579	THR
1	B	820	LEU
1	B	826	ILE
1	B	884	SER
1	B	896	SER
1	B	900	SER
1	B	903	ILE
1	B	954	GLU
1	B	956	MET
1	B	958	LEU
1	B	988	THR
1	B	1029	HIS
1	B	1034	THR
1	B	1050	ILE
1	B	1054	THR
1	B	1158	MET
1	B	1168	GLU
1	B	1169	TRP
1	B	1185	THR
1	B	1194	LEU
1	B	1198	VAL
1	B	1217	VAL
1	B	1283	LEU
1	B	1295	MET
1	B	1319	ILE
1	B	1354	THR
1	B	1358	THR
1	B	1382	HIS
1	B	1503	MET
1	B	1516	ASN
1	B	1520	LEU
1	B	1553	ILE
1	B	1554	GLU
1	B	1563	VAL
1	B	1575	THR
1	B	1602	LEU
1	B	1635	LYS
1	B	1643	GLU
1	B	1644	VAL
1	B	1648	LYS
1	B	1650	LEU

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Mol	Chain	Res	Type
1	B	1652	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	837	GLN
1	A	915	GLN
1	A	928	ASN
1	A	987	ASN
1	A	1013	ASN
1	A	1237	GLN
1	A	1413	ASN
1	A	1453	GLN
1	A	1472	ASN
1	A	1475	ASN
1	A	1496	GLN
1	A	1518	GLN
1	A	1612	GLN
1	B	809	ASN
1	B	823	GLN
1	B	932	GLN
1	B	980	GLN
1	B	1002	ASN
1	B	1189	GLN
1	B	1375	ASN
1	B	1379	ASN
1	B	1501	ASN
1	B	1516	ASN
1	B	1550	ASN

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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.

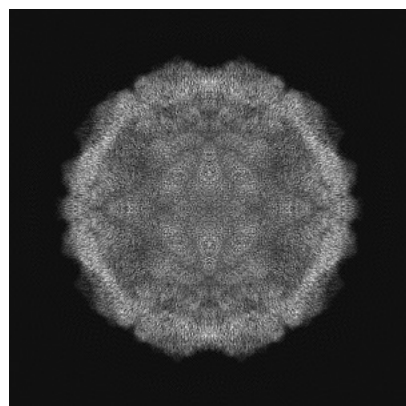
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-55928. These allow visual inspection of the internal detail of the map and identification of artifacts.

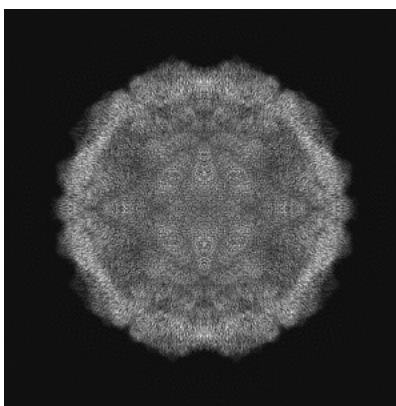
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

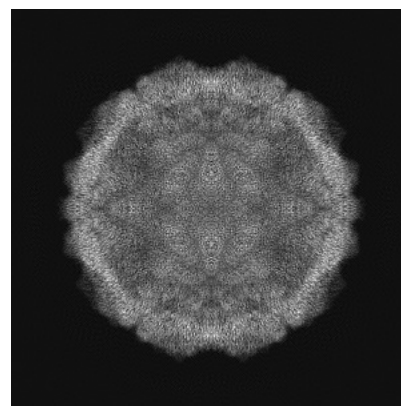
6.1.1 Primary map



X

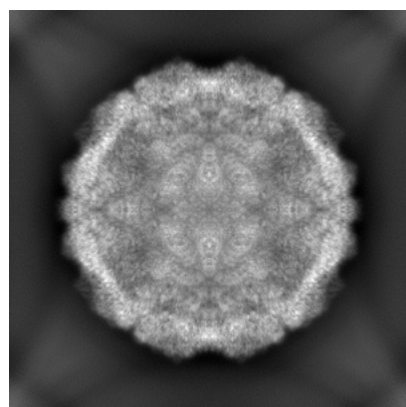


Y

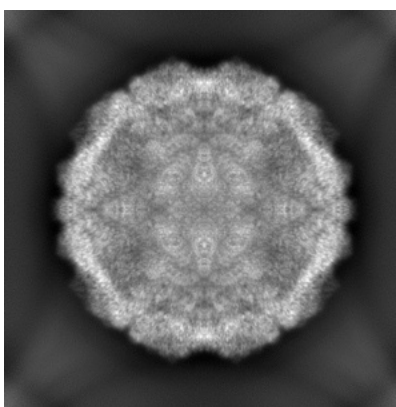


Z

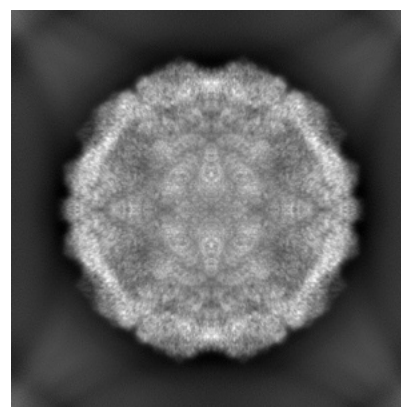
6.1.2 Raw map



X



Y

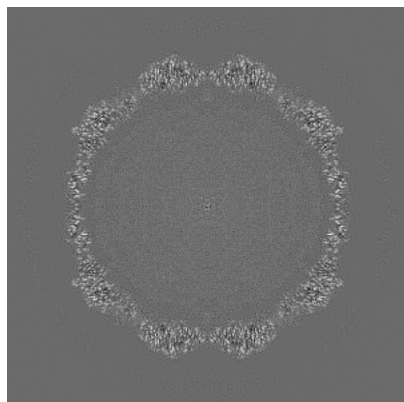


Z

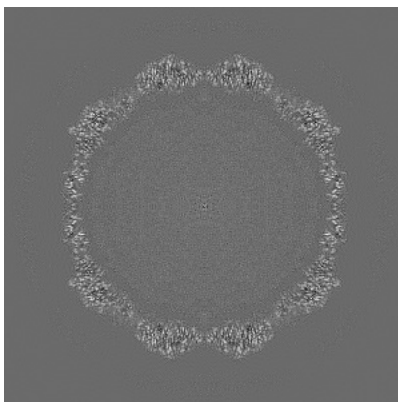
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

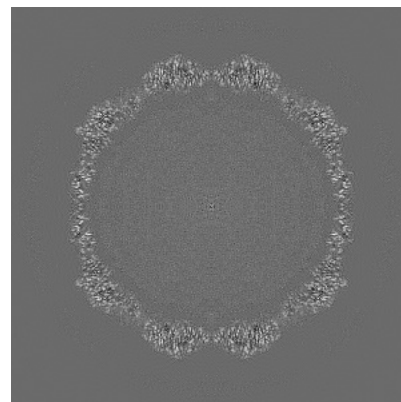
6.2.1 Primary map



X Index: 300

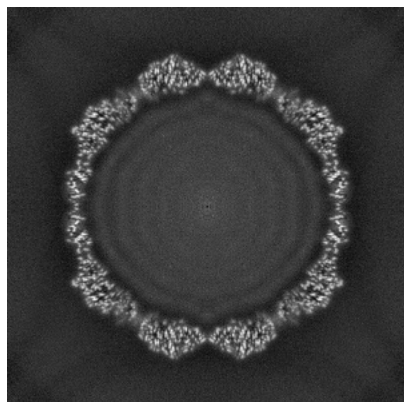


Y Index: 300

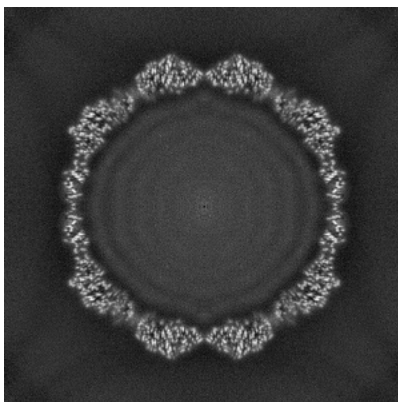


Z Index: 300

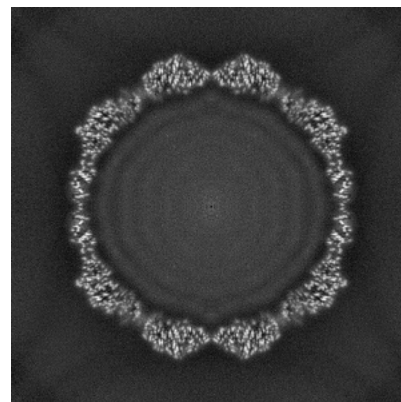
6.2.2 Raw map



X Index: 300



Y Index: 300

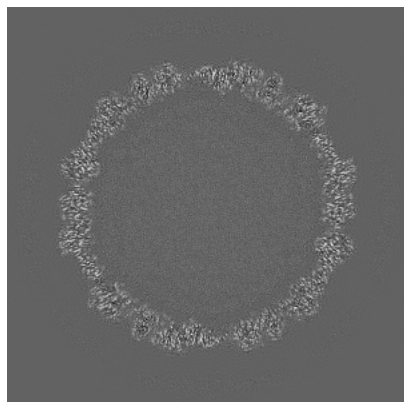


Z Index: 300

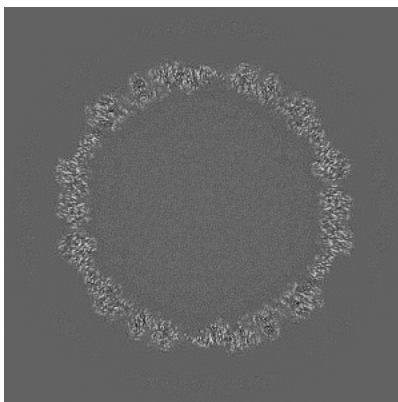
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

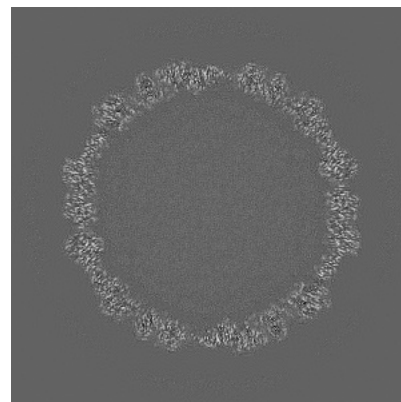
6.3.1 Primary map



X Index: 265

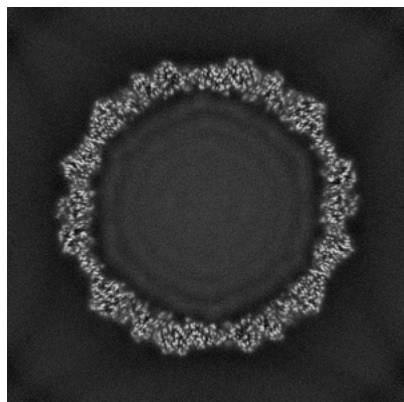


Y Index: 335

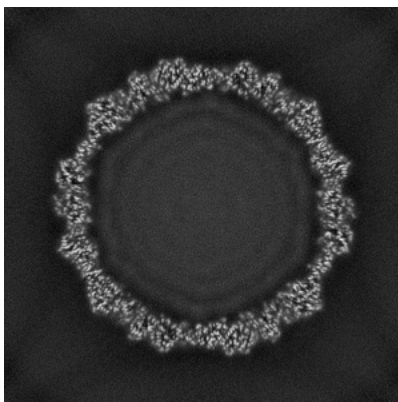


Z Index: 335

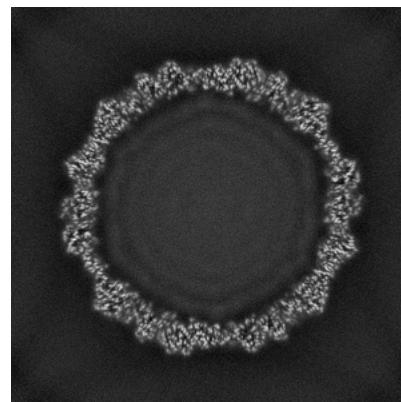
6.3.2 Raw map



X Index: 260



Y Index: 340

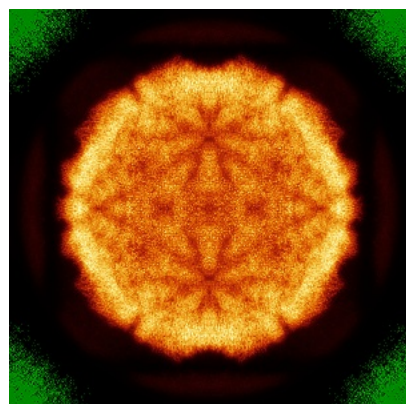


Z Index: 260

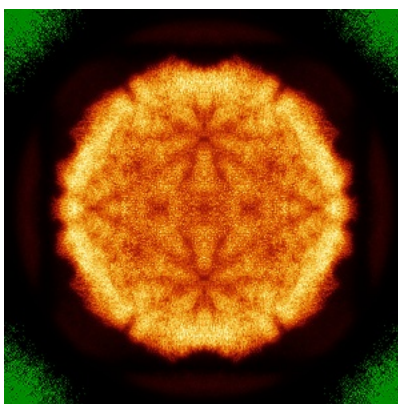
The images above show the largest variance slices of the map in three orthogonal directions.

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

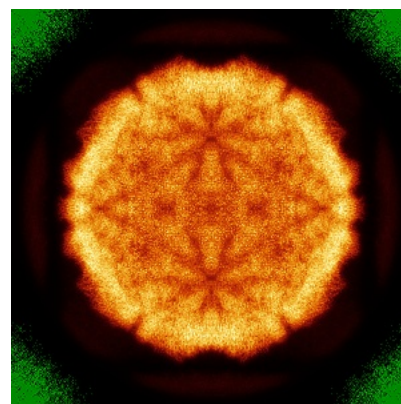
6.4.1 Primary map



X

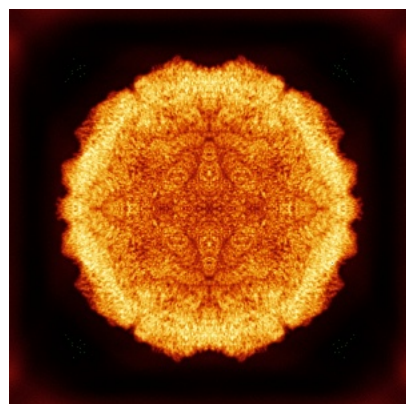


Y

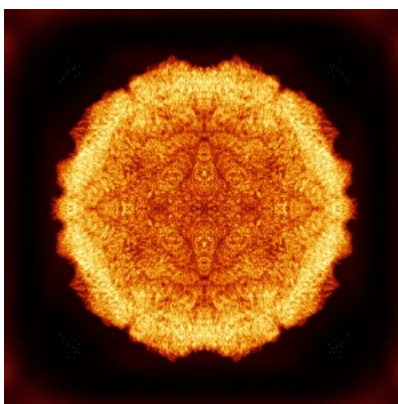


Z

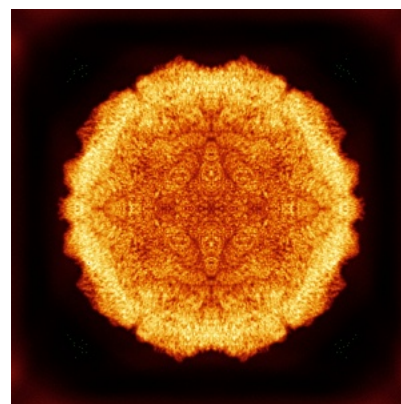
6.4.2 Raw map



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



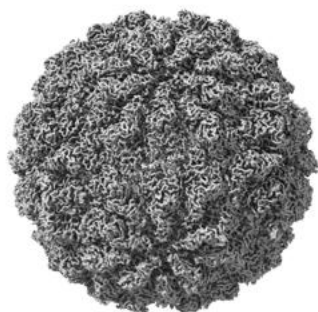
Y



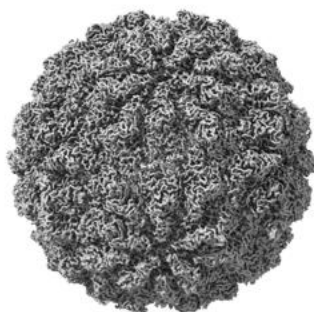
Z

The images above show the 3D surface view of the map at the recommended contour level 0.7329. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

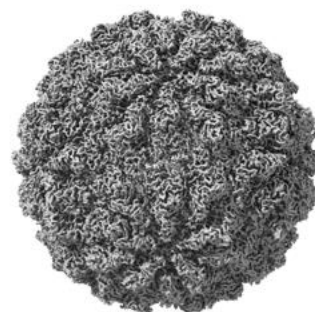
6.5.2 Raw map



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.

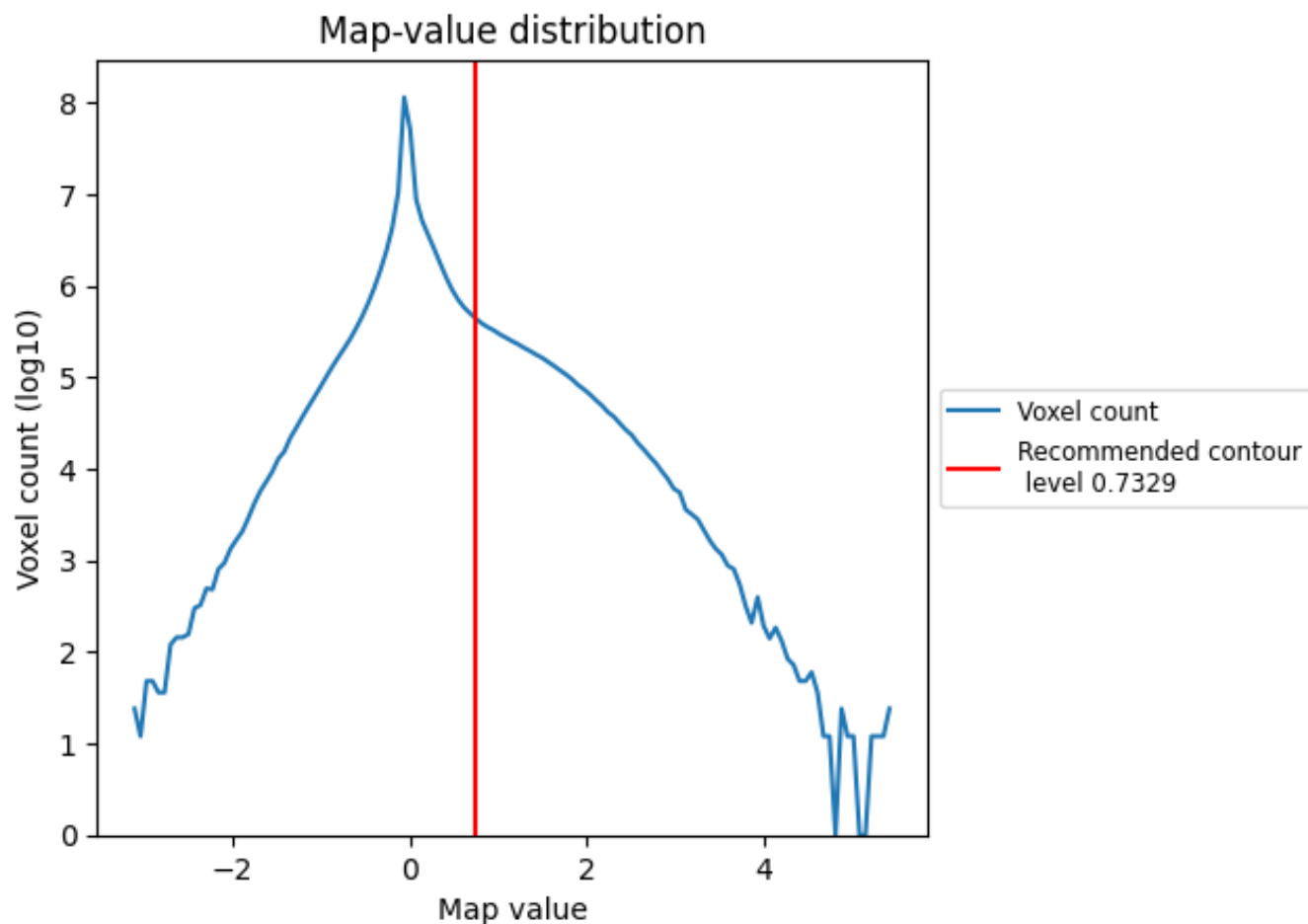
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

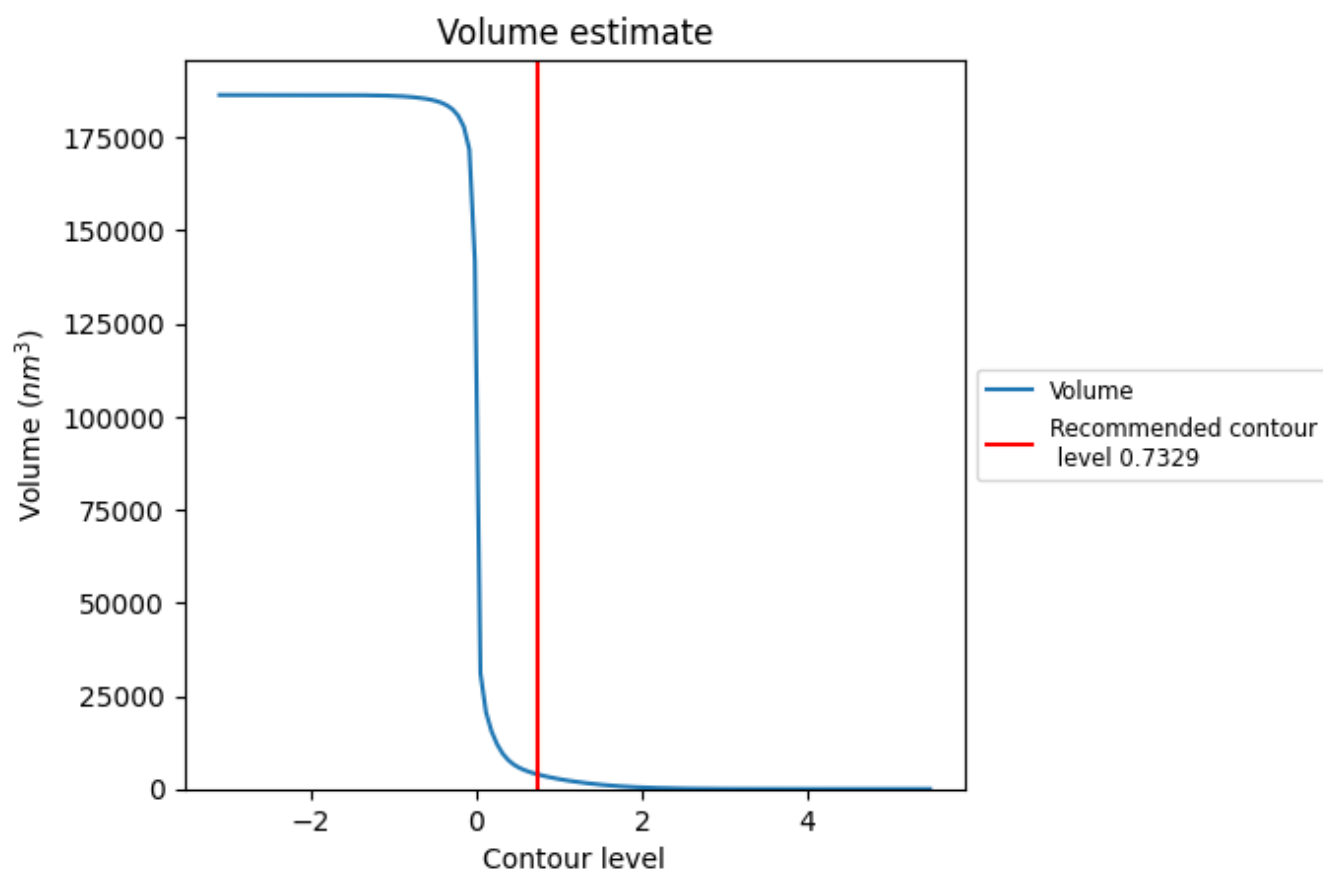
This section contains the results of statistical analysis of the map.

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.

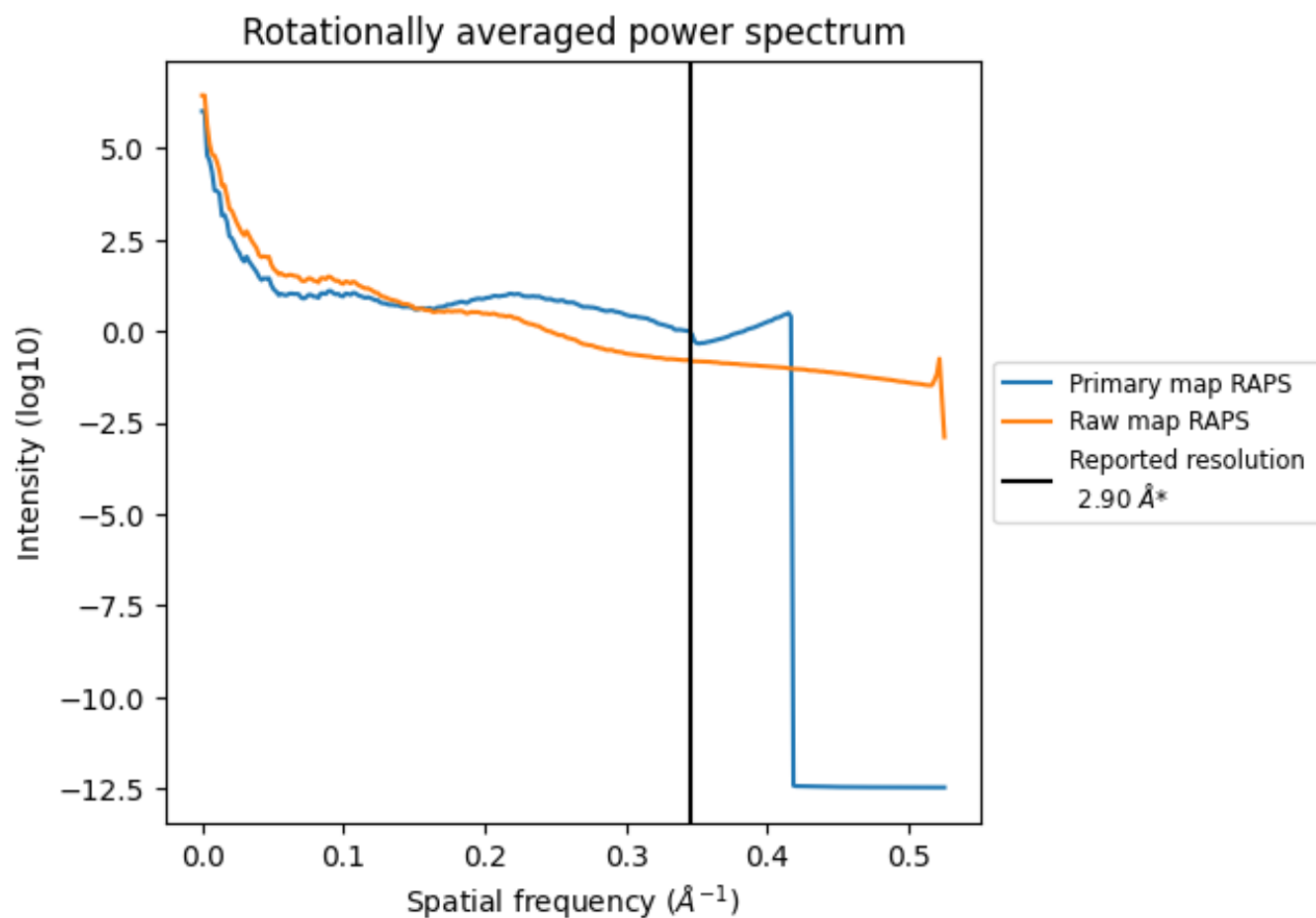
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3973 nm^3 ; this corresponds to an approximate mass of 3589 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

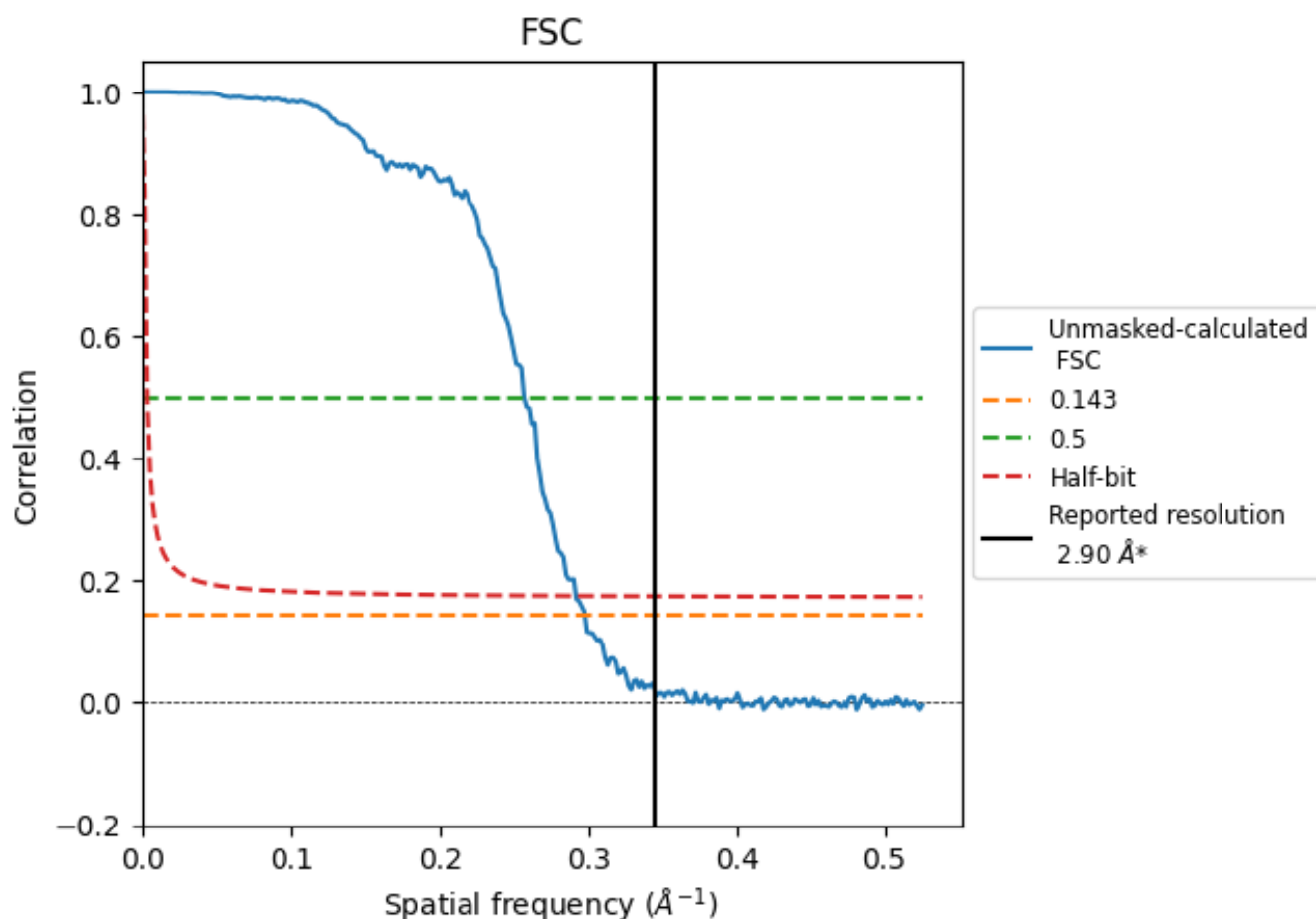


*Reported resolution corresponds to spatial frequency of 0.345 Å⁻¹

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 0.345 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

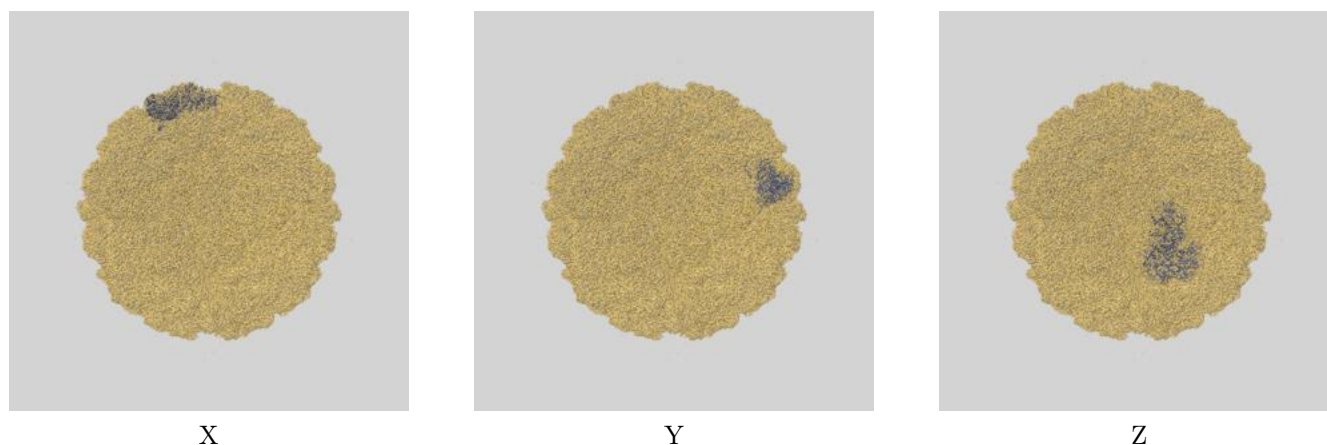
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.36	3.89	3.42

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.36 differs from the reported value 2.9 by more than 10 %

9 Map-model fit [i](#)

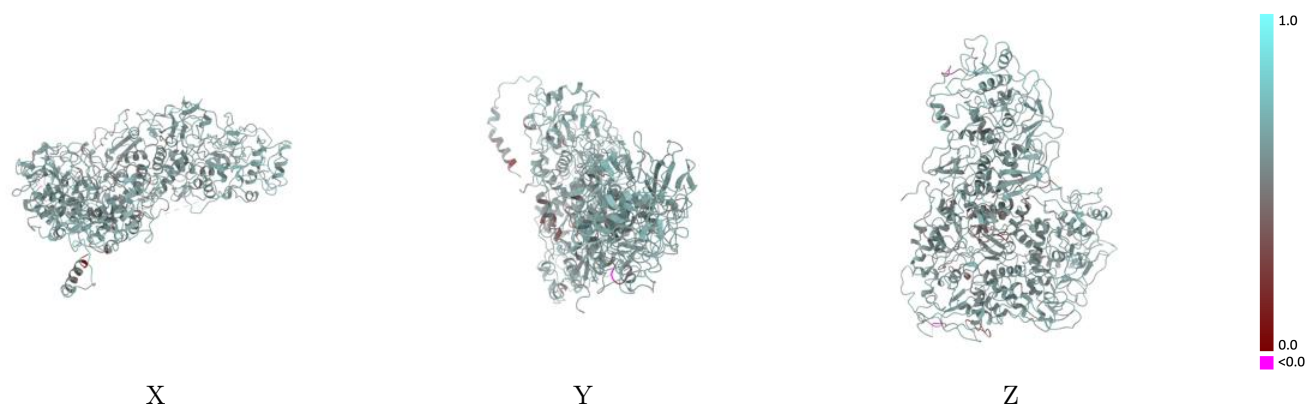
This section contains information regarding the fit between EMDB map EMD-55928 and PDB model 9THI. Per-residue inclusion information can be found in [section 3](#) on [page 4](#).

9.1 Map-model overlay [i](#)



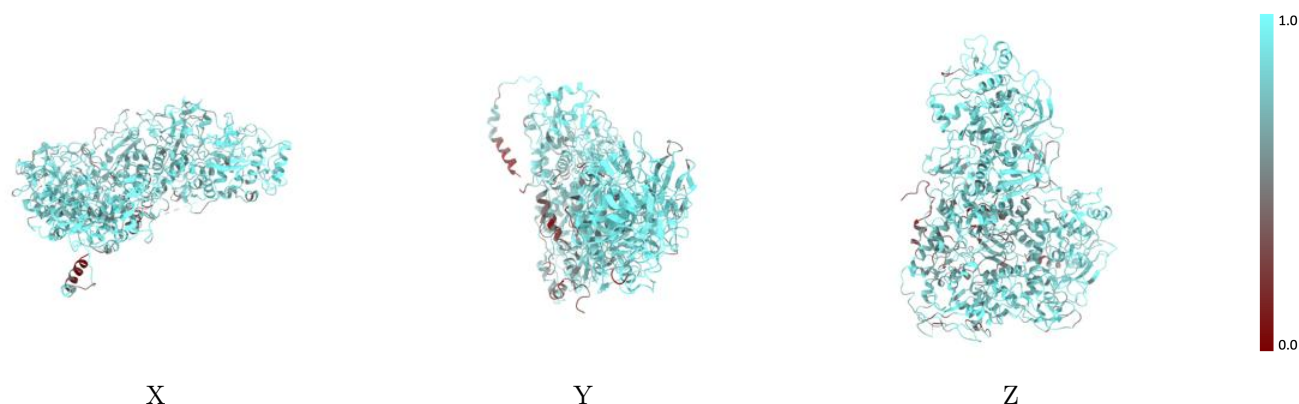
The images above show the 3D surface view of the map at the recommended contour level 0.7329 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



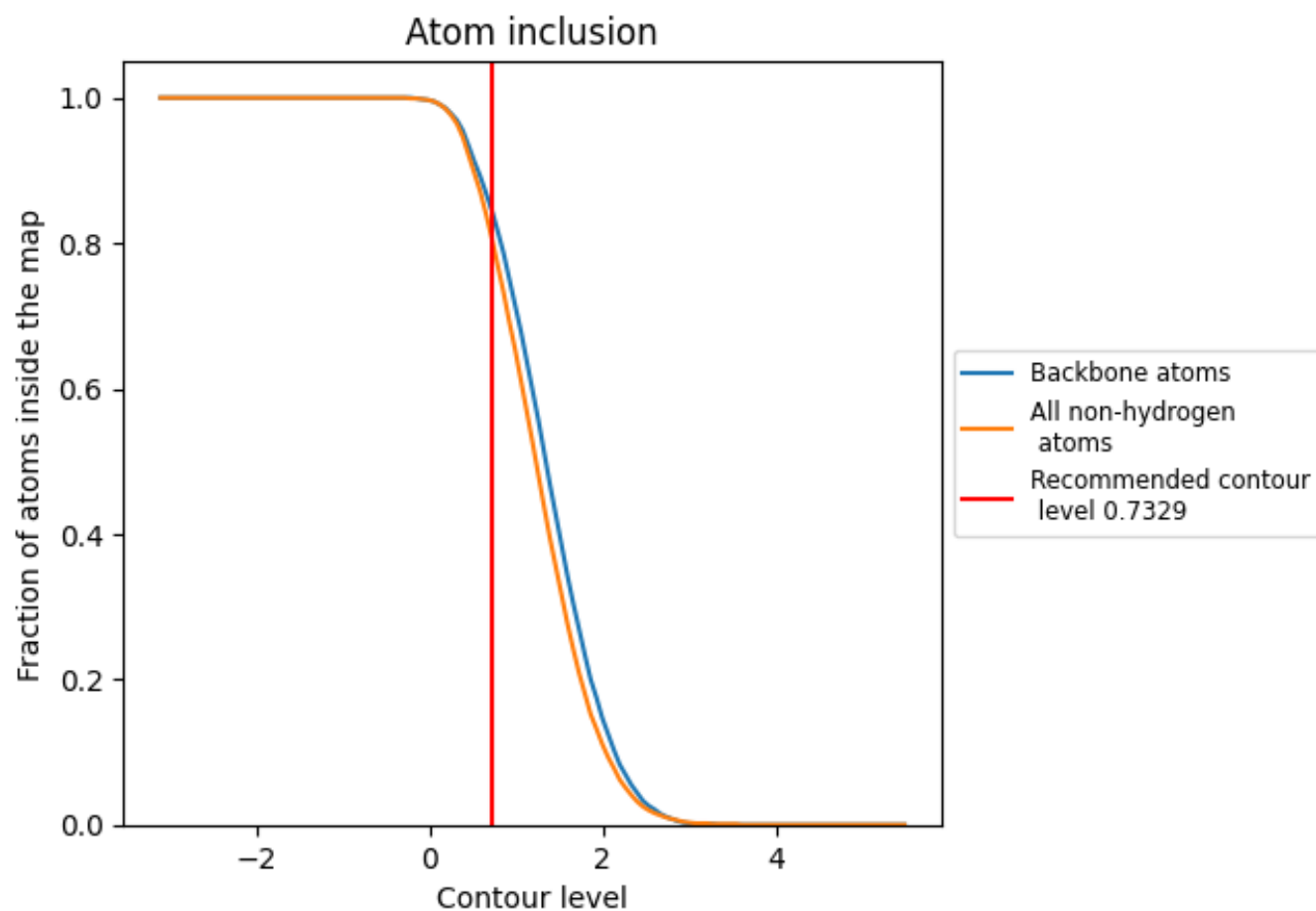
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.7329).

9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 80% 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 (0.7329) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8010	0.5670
A	0.8040	0.5690
B	0.7980	0.5650

