



Full wwPDB EM Validation Report ⓘ

Nov 3, 2024 – 06:54 am GMT

PDB ID : 7QFQ
EMDB ID : EMD-13947
Title : Cryo-EM structure of Botulinum neurotoxin serotype B
Authors : Kosenina, S.; Martinez-Carranza, M.; Davies, J.R.; Masuyer, G.; Stenmark, P.
Deposited on : 2021-12-06
Resolution : 3.60 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.dev113
MolProbity : 4.02b-467
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) : 2.39

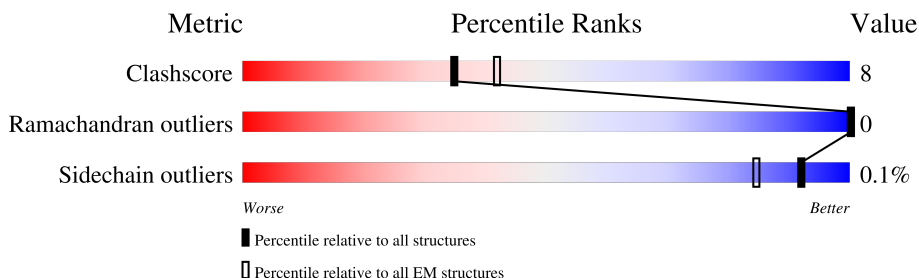
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.60 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1307	<div> <div>30%</div> <div>79%</div> <div>20%</div> </div>

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 10659 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 Botulinum neurotoxin type B.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1291	Total	C	N	O	S	0	0
			10659	6878	1714	2032	35		

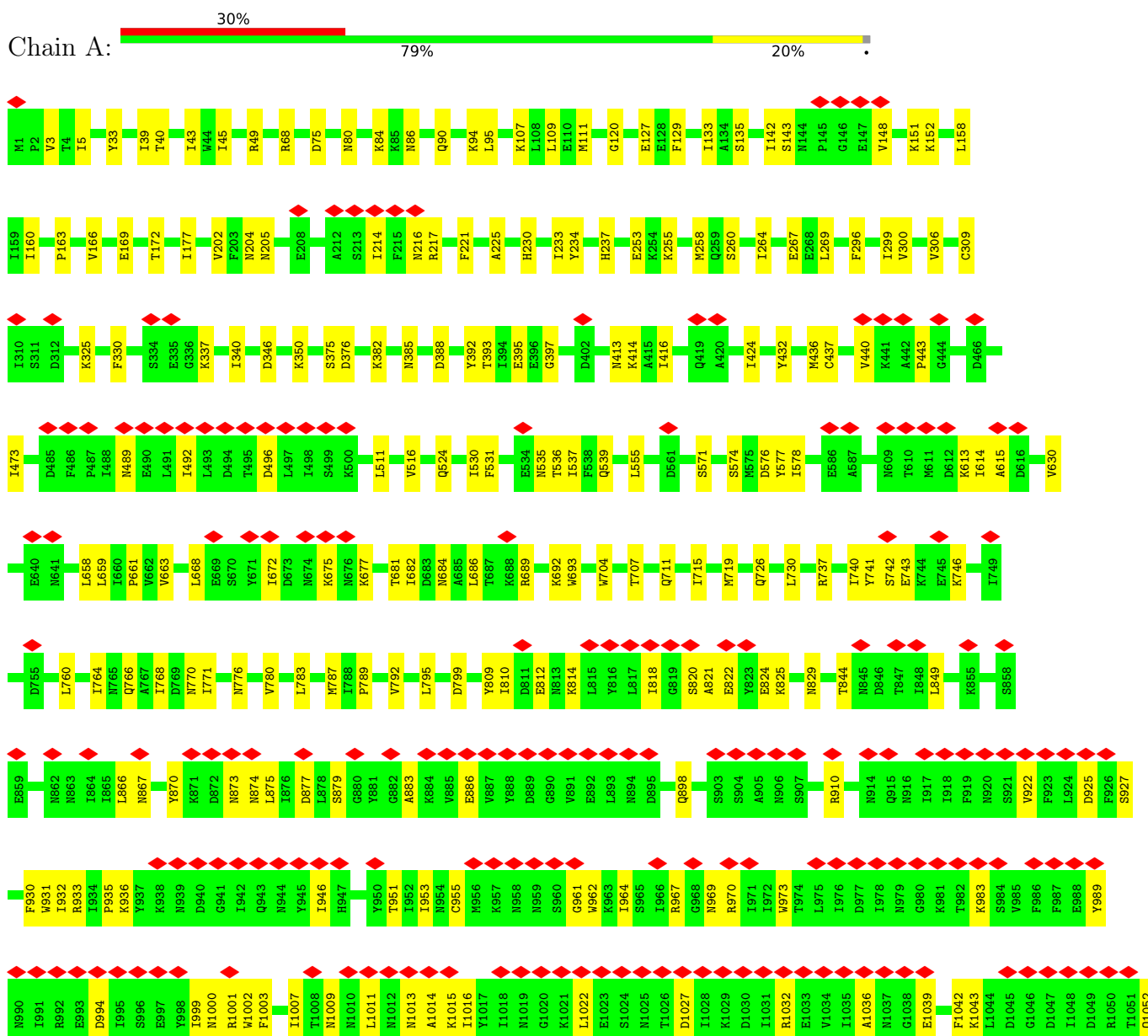
There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	231	GLN	GLU	engineered mutation	UNP P10844
A	234	TYR	HIS	engineered mutation	UNP P10844
A	1191	MET	GLU	conflict	UNP P10844
A	1199	TYR	SER	conflict	UNP P10844
A	1292	LEU	-	expression tag	UNP P10844
A	1293	GLU	-	expression tag	UNP P10844
A	1294	VAL	-	expression tag	UNP P10844
A	1295	LEU	-	expression tag	UNP P10844
A	1296	PHE	-	expression tag	UNP P10844
A	1297	GLN	-	expression tag	UNP P10844
A	1298	GLY	-	expression tag	UNP P10844
A	1299	PRO	-	expression tag	UNP P10844
A	1300	LEU	-	expression tag	UNP P10844
A	1301	GLU	-	expression tag	UNP P10844
A	1302	HIS	-	expression tag	UNP P10844
A	1303	HIS	-	expression tag	UNP P10844
A	1304	HIS	-	expression tag	UNP P10844
A	1305	HIS	-	expression tag	UNP P10844
A	1306	HIS	-	expression tag	UNP P10844
A	1307	HIS	-	expression tag	UNP P10844

3 Residue-property plots

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: Botulinum neurotoxin type B



LEU	I1240	RI179	GI119	FI053
GLU	HI241	VI180	EI120	I1054
HIS	RI242	YI181	I1121	HI055
HIS	FI243	TI182	LI122	HI056
HIS	VI244	YI183	TI123	YI058
HIS	EI245	KI184	RI124	FI059
HIS	S1246	YI185	KI125	SI060
	GI247	FI186	S1126	
	I1248	KI187	YI127	NI063
	VI249	KI188	NI128	TI064
	FI250	EI189	QI129	EI065
	EI251	EI190	NI130	L1066
	EI252	MI191	SI131	SI067
	YI253	KI192	KI132	QI068
	KI254	LI193	YI133	SI069
	DI255	FI194	I1134	NI070
	YI256	LI195	I1135	I1071
	FI257	AI196	NI136	EI072
	CI258	PI197	YI136	EI073
	I1259	II198	RI137	
	SI260	YI199	DI138	SI079
	KI261	DI200	LI139	YI080
	W1262	SI201	YI140	SI081
	YI263	DI202	II141	EI082
	LI264	EI203	KI142	YI083
	KI265	FI204	EI143	
	EI266	YI205	FI145	DI086
	YI267	NI206	II146	FI087
	KI268	TI207	II147	HI088
	RI269	II208	RI148	GI089
	KI270	QI209	RI149	NI090
	YI271	YI210	KI150	PI091
	YI272	KI211	SI151	LI092
	NI273	EI212	NI152	MI093
	LI274	YI213	NI153	YI094
	KI275	DI214	QI154	NI095
	LI276	EI215	SI155	KI096
	GI277	QI216	II156	EI097
	KI278	PI217	NI157	YI098
	NI279	YI218	FI101	YI099
	W1280	YI219	MI102	MI100
	QI281	SI220	LI103	FI101
	FI282	LI223	DI158	MI102
	II283	LI224	DI159	AI103
	PI284	FI225	II160	GI104
	KI285	KI226	VI161	NI105
	DI286	KI227	FI162	KI106
	EI287	DI228	KI163	NI107
	GI288	EI229	EI164	SI108
	W1289	EI230	DI165	YI109
	TI290	SI231	YI166	II110
	EI291	TI232	II167	KI111
LEU	GLU	EI233	YI168	LI112
GLU	VAL	DI233	LI169	KI113
VAL	LEU	EI234	DI170	KI114
LEU	PHE	II235	FI171	DI115
PHE	GLN	GI236	FI172	SI116
GLN	GLY	LI237	NI173	FI117
GLY	PRO	II238	LI174	YI118
PRO		GI239	NI175	
			QI176	
			EI177	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	286802	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 ($e^-/\text{\AA}^2$)	50.0	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	2.181	Depositor
Minimum map value	-1.697	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.034	Depositor
Recommended contour level	0.252	Depositor
Map size (Å)	327.0, 327.0, 327.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.09, 1.09, 1.09	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	0.25	0/10893	0.46	0/14716

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	10659	0	10529	165	0
All	All	10659	0	10529	165	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 (165) 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:844:THR:HG21	1:A:849:LEU:HD12	1.66	0.77
1:A:668:LEU:HD11	1:A:681:THR:HB	1.69	0.75
1:A:536:THR:HG22	1:A:537:ILE:H	1.50	0.75
1:A:1237:LEU:HD12	1:A:1267:VAL:HG23	1.69	0.75
1:A:95:LEU:HD22	1:A:225:ALA:HB2	1.69	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:933:ARG:HB2	1:A:1055:TRP:HB2	1.72	0.71
1:A:1107:ASN:HB2	1:A:1124:ARG:H	1.57	0.69
1:A:120:GLY:HA2	1:A:133:ILE:HD12	1.75	0.67
1:A:933:ARG:NH2	1:A:1000:ASN:OD1	2.27	0.67
1:A:925:ASP:HA	1:A:1009:ASN:O	1.95	0.67
1:A:346:ASP:OD1	1:A:350:LYS:NZ	2.26	0.66
1:A:886:GLU:HB3	1:A:910:ARG:HB3	1.78	0.66
1:A:142:ILE:HD11	1:A:152:LYS:HB2	1.77	0.66
1:A:983:LYS:NZ	1:A:1027:ASP:O	2.28	0.65
1:A:814:LYS:HE2	1:A:818:ILE:HD12	1.78	0.65
1:A:1239:GLY:HA3	1:A:1260:SER:HB2	1.78	0.65
1:A:440:VAL:HB	1:A:443:PRO:HG3	1.79	0.65
1:A:33:TYR:OH	1:A:151:LYS:NZ	2.31	0.64
1:A:814:LYS:NZ	1:A:820:SER:O	2.32	0.63
1:A:766:GLN:NE2	1:A:770:ASN:OD1	2.33	0.61
1:A:672:ILE:HD13	1:A:677:LYS:HE2	1.83	0.61
1:A:946:ILE:O	1:A:967:ARG:NH2	2.35	0.60
1:A:931:TRP:HB2	1:A:1057:LYS:HB3	1.84	0.59
1:A:1087:PHE:HB2	1:A:1283:ILE:HG12	1.83	0.59
1:A:613:LYS:HD3	1:A:615:ALA:H	1.66	0.59
1:A:630:VAL:HG21	1:A:715:ILE:HD11	1.83	0.59
1:A:825:LYS:O	1:A:829:ASN:ND2	2.32	0.59
1:A:951:THR:OG1	1:A:964:ILE:O	2.18	0.59
1:A:962:TRP:HE1	1:A:1036:ALA:HB2	1.68	0.59
1:A:933:ARG:HD2	1:A:1002:TRP:CD1	2.37	0.58
1:A:172:THR:HG21	1:A:234:TYR:HB3	1.86	0.58
1:A:535:ASN:HA	1:A:539:GLN:HG3	1.85	0.58
1:A:613:LYS:HD3	1:A:614:ILE:N	2.18	0.57
1:A:1180:VAL:HG13	1:A:1193:LEU:HD12	1.87	0.57
1:A:1258:CYS:SG	1:A:1260:SER:OG	2.62	0.56
1:A:1015:LYS:HB3	1:A:1022:LEU:HD21	1.87	0.56
1:A:1240:ILE:HG22	1:A:1257:PHE:HD1	1.70	0.56
1:A:217:ARG:HE	1:A:414:LYS:HE2	1.71	0.56
1:A:413:ASN:HB3	1:A:416:ILE:HG22	1.88	0.56
1:A:967:ARG:HB2	1:A:970:ARG:HB2	1.88	0.55
1:A:930:PHE:HA	1:A:1058:TYR:O	2.06	0.55
1:A:300:VAL:HG21	1:A:340:ILE:HG13	1.87	0.55
1:A:910:ARG:NH1	1:A:1039:GLU:OE2	2.40	0.54
1:A:1238:ILE:HG22	1:A:1267:VAL:HG22	1.89	0.54
1:A:68:ARG:NH2	1:A:432:TYR:OH	2.41	0.54
1:A:129:PHE:HB2	1:A:309:CYS:HB2	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:49:ARG:HH11	1:A:163:PRO:HG2	1.72	0.52
1:A:1098:TYR:HE1	1:A:1284:PRO:HG3	1.75	0.52
1:A:953:ILE:HG12	1:A:1042:PHE:CE2	2.45	0.51
1:A:68:ARG:NH1	1:A:524:GLN:OE1	2.44	0.51
1:A:719:MET:HG2	1:A:771:ILE:HG21	1.93	0.51
1:A:94:LYS:HE2	1:A:392:TYR:HD2	1.77	0.50
1:A:555:LEU:H	1:A:555:LEU:HD12	1.76	0.50
1:A:789:PRO:HA	1:A:792:VAL:HG12	1.93	0.50
1:A:1101:PHE:HB3	1:A:1281:GLN:HB2	1.94	0.50
1:A:983:LYS:HB2	1:A:1032:ARG:NH2	2.26	0.50
1:A:571:SER:HA	1:A:726:GLN:NE2	2.27	0.49
1:A:436:MET:HG2	1:A:530:ILE:HD11	1.94	0.49
1:A:1007:ILE:HG22	1:A:1016:ILE:HD12	1.94	0.49
1:A:898:GLN:HE21	1:A:1002:TRP:HZ2	1.60	0.49
1:A:1218:THR:HG23	1:A:1220:SER:H	1.78	0.49
1:A:202:VAL:HG22	1:A:221:PHE:HB3	1.95	0.49
1:A:571:SER:HA	1:A:726:GLN:HE22	1.78	0.48
1:A:385:ASN:OD1	1:A:388:ASP:N	2.41	0.48
1:A:689:ARG:NH2	1:A:799:ASP:OD2	2.46	0.48
1:A:1127:TYR:HE2	1:A:1136:TYR:HB3	1.77	0.48
1:A:107:LYS:HE2	1:A:496:ASP:HA	1.96	0.48
1:A:675:LYS:O	1:A:677:LYS:HG3	2.14	0.48
1:A:760:LEU:O	1:A:764:ILE:HG12	2.14	0.48
1:A:822:GLU:HA	1:A:825:LYS:HG3	1.95	0.48
1:A:43:ILE:HD13	1:A:158:LEU:HB3	1.96	0.47
1:A:1210:ILE:HG12	1:A:1223:LEU:HD23	1.96	0.47
1:A:537:ILE:HD11	1:A:715:ILE:HD13	1.97	0.47
1:A:1214:ASP:HB3	1:A:1273:ASN:H	1.79	0.47
1:A:143:SER:OG	1:A:148:VAL:O	2.31	0.47
1:A:809:TYR:O	1:A:812:GLU:HG3	2.14	0.47
1:A:1002:TRP:CZ3	1:A:1057:LYS:HB2	2.49	0.47
1:A:204:ASN:OD1	1:A:205:ASN:N	2.47	0.47
1:A:704:TRP:CG	1:A:783:LEU:HD13	2.49	0.47
1:A:935:PRO:HG2	1:A:1052:GLN:HG3	1.97	0.47
1:A:1140:TYR:HB2	1:A:1289:TRP:CZ3	2.50	0.47
1:A:574:SER:O	1:A:578:ILE:HG12	2.14	0.47
1:A:969:ASN:ND2	1:A:989:TYR:O	2.43	0.47
1:A:296:PHE:O	1:A:300:VAL:HG23	2.16	0.46
1:A:1240:ILE:HG22	1:A:1257:PHE:CD1	2.50	0.46
1:A:177:ILE:HG22	1:A:516:VAL:HG23	1.98	0.46
1:A:133:ILE:HG22	1:A:135:SER:H	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1117:PRO:HB2	1:A:1178:TRP:HZ2	1.79	0.46
1:A:994:ASP:O	1:A:1137:ARG:NH2	2.36	0.46
1:A:930:PHE:CE2	1:A:932:ILE:HD11	2.51	0.46
1:A:3:VAL:HG23	1:A:40:THR:HG21	1.98	0.46
1:A:927:SER:HA	1:A:1007:ILE:O	2.15	0.46
1:A:932:ILE:HB	1:A:1003:PHE:CZ	2.51	0.46
1:A:764:ILE:O	1:A:768:ILE:HG12	2.16	0.45
1:A:489:ASN:HA	1:A:492:ILE:HD12	1.97	0.45
1:A:659:LEU:HD23	1:A:661:PRO:HD3	1.98	0.45
1:A:45:ILE:HD13	1:A:160:ILE:HB	1.98	0.45
1:A:80:ASN:H	1:A:84:LYS:HD2	1.81	0.45
1:A:473:ILE:HD11	1:A:684:ASN:HB3	1.98	0.45
1:A:877:ASP:OD2	1:A:883:ALA:N	2.49	0.45
1:A:214:ILE:HG13	1:A:216:ASN:H	1.81	0.45
1:A:375:SER:OG	1:A:376:ASP:N	2.49	0.45
1:A:1257:PHE:CD1	1:A:1277:GLY:HA3	2.51	0.45
1:A:870:TYR:HE1	1:A:873:ASN:HA	1.81	0.45
1:A:49:ARG:NH2	1:A:75:ASP:O	2.49	0.45
1:A:237:HIS:ND1	1:A:267:GLU:OE2	2.34	0.45
1:A:663:VAL:HG21	1:A:692:LYS:HD3	1.98	0.45
1:A:743:GLU:HA	1:A:746:LYS:HE3	1.99	0.45
1:A:737:ARG:O	1:A:740:ILE:HG22	2.17	0.44
1:A:511:LEU:HD23	1:A:511:LEU:H	1.83	0.44
1:A:874:ASN:OD1	1:A:875:LEU:N	2.49	0.44
1:A:382:LYS:HB3	1:A:424:ILE:HD11	1.98	0.44
1:A:693:TRP:CZ2	1:A:795:LEU:HB3	2.53	0.44
1:A:866:LEU:HD23	1:A:1059:PHE:HE2	1.83	0.44
1:A:86:ASN:O	1:A:90:GLN:HG2	2.18	0.44
1:A:1001:ARG:NE	1:A:1088:TRP:HA	2.32	0.44
1:A:1002:TRP:HZ3	1:A:1057:LYS:HB2	1.83	0.44
1:A:414:LYS:HE2	1:A:414:LYS:HB3	1.77	0.44
1:A:1098:TYR:CD1	1:A:1282:PHE:HB3	2.53	0.44
1:A:1001:ARG:HE	1:A:1088:TRP:HA	1.82	0.44
1:A:576:ASP:OD1	1:A:577:TYR:N	2.49	0.44
1:A:999:ILE:O	1:A:1001:ARG:HG2	2.18	0.44
1:A:1043:LYS:HD2	1:A:1043:LYS:HA	1.85	0.44
1:A:730:LEU:HD23	1:A:760:LEU:HD21	1.99	0.44
1:A:1088:TRP:HE1	1:A:1090:ASN:HB2	1.83	0.44
1:A:577:TYR:HD1	1:A:578:ILE:HD13	1.82	0.43
1:A:658:LEU:HD21	1:A:787:MET:HG2	2.00	0.43
1:A:109:LEU:C	1:A:111:MET:H	2.22	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:682:ILE:O	1:A:686:LEU:HG	2.18	0.43
1:A:1013:ASN:OD1	1:A:1014:ALA:N	2.51	0.43
1:A:936:LYS:HD3	1:A:1289:TRP:HD1	1.83	0.43
1:A:955:CYS:O	1:A:961:GLY:HA3	2.18	0.43
1:A:1071:ILE:HG13	1:A:1072:GLU:N	2.33	0.43
1:A:867:ASN:H	1:A:879:SER:HG	1.63	0.43
1:A:1117:PRO:HB2	1:A:1178:TRP:CZ2	2.54	0.43
1:A:337:LYS:N	1:A:337:LYS:HD2	2.33	0.42
1:A:1166:TYR:HD2	1:A:1207:THR:HG21	1.84	0.42
1:A:253:GLU:OE2	1:A:260:SER:OG	2.26	0.42
1:A:922:VAL:HG21	1:A:1011:LEU:HD11	2.00	0.42
1:A:877:ASP:OD1	1:A:877:ASP:N	2.52	0.42
1:A:393:THR:HG22	1:A:395:GLU:H	1.83	0.42
1:A:776:ASN:O	1:A:780:VAL:HG23	2.20	0.42
1:A:1109:TYR:O	1:A:1121:ILE:HA	2.20	0.42
1:A:325:LYS:HG2	1:A:330:PHE:HB2	2.01	0.42
1:A:810:ILE:HG13	1:A:814:LYS:HB3	2.01	0.42
1:A:1257:PHE:CG	1:A:1277:GLY:HA3	2.54	0.41
1:A:707:THR:O	1:A:711:GLN:HG3	2.20	0.41
1:A:127:GLU:HA	1:A:306:VAL:HA	2.01	0.41
1:A:296:PHE:O	1:A:299:ILE:HG22	2.20	0.41
1:A:964:ILE:HG13	1:A:973:TRP:CD1	2.55	0.41
1:A:898:GLN:HG2	1:A:1002:TRP:HH2	1.85	0.41
1:A:166:VAL:HG12	1:A:169:GLU:H	1.85	0.41
1:A:264:ILE:HD12	1:A:269:LEU:HD21	2.03	0.41
1:A:230:HIS:O	1:A:233:ILE:HG22	2.21	0.41
1:A:741:TYR:CG	1:A:742:SER:N	2.89	0.41
1:A:821:ALA:HA	1:A:824:GLU:OE2	2.19	0.41
1:A:1256:TYR:CE2	1:A:1258:CYS:HB3	2.56	0.41
1:A:255:LYS:HB2	1:A:258:MET:HG2	2.03	0.41
1:A:1213:TYR:CE2	1:A:1270:LYS:HG3	2.56	0.41
1:A:536:THR:HG22	1:A:537:ILE:N	2.28	0.41
1:A:107:LYS:HB2	1:A:107:LYS:HE3	1.86	0.41
1:A:437:CYS:O	1:A:531:PHE:HA	2.21	0.40
1:A:5:ILE:HG23	1:A:39:ILE:HG23	2.02	0.40
1:A:393:THR:O	1:A:397:GLY:N	2.53	0.40
1:A:953:ILE:HG12	1:A:1042:PHE:HE2	1.84	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	1289/1307 (99%)	1219 (95%)	70 (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	1190/1205 (99%)	1189 (100%)	1 (0%)	92	97

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1088	TRP

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 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.

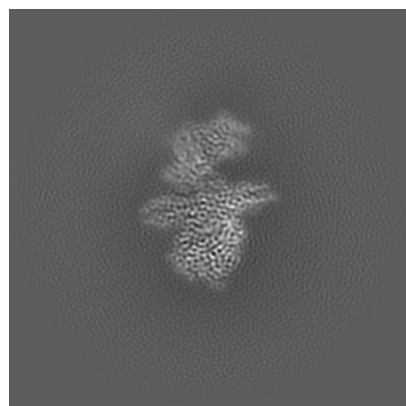
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13947. These allow visual inspection of the internal detail of the map and identification of artifacts.

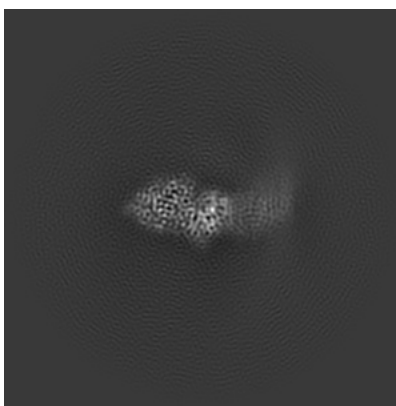
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

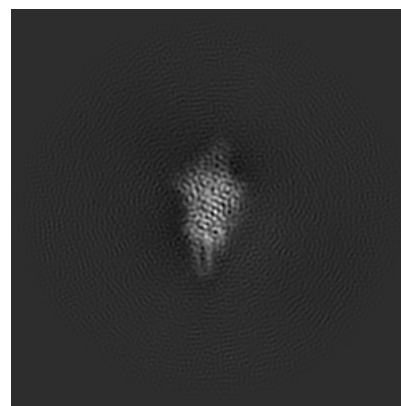
6.1.1 Primary map



X

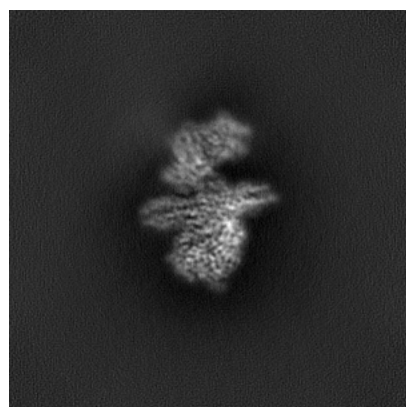


Y

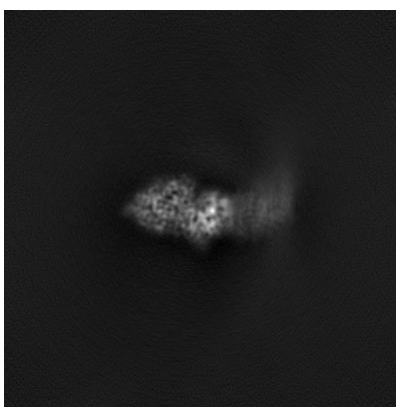


Z

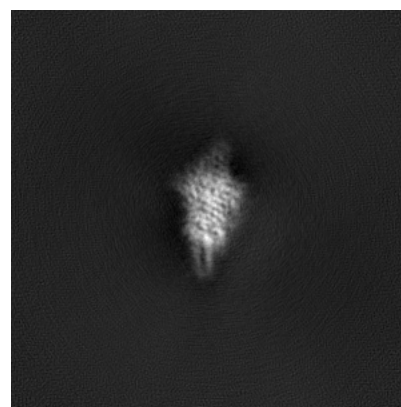
6.1.2 Raw map



X



Y

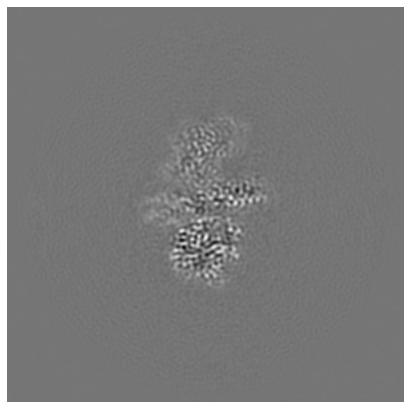


Z

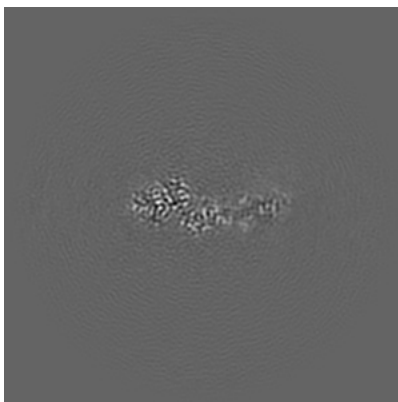
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

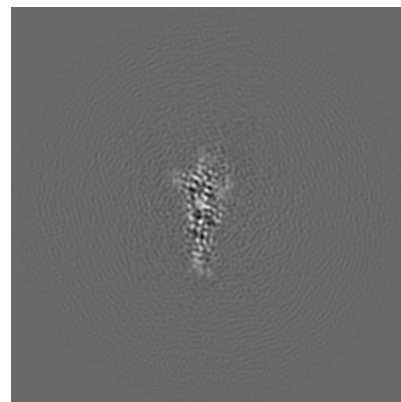
6.2.1 Primary map



X Index: 150

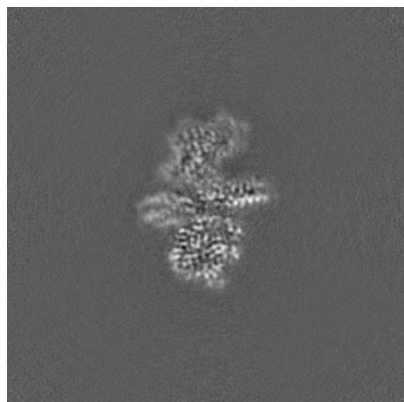


Y Index: 150

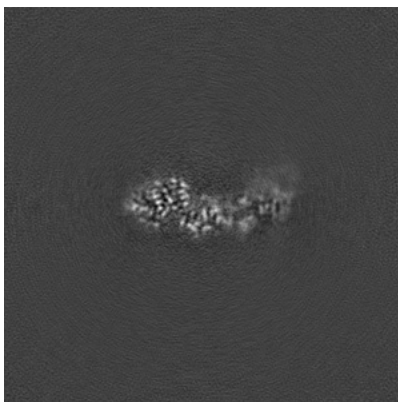


Z Index: 150

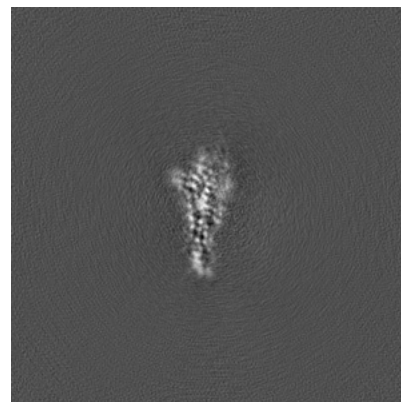
6.2.2 Raw map



X Index: 150



Y Index: 150

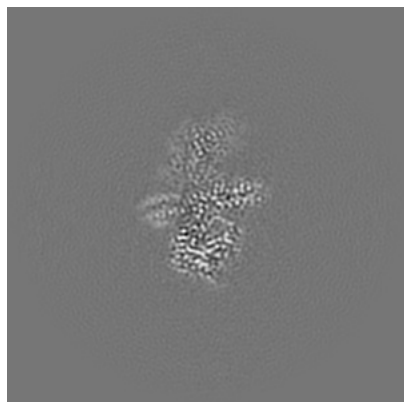


Z Index: 150

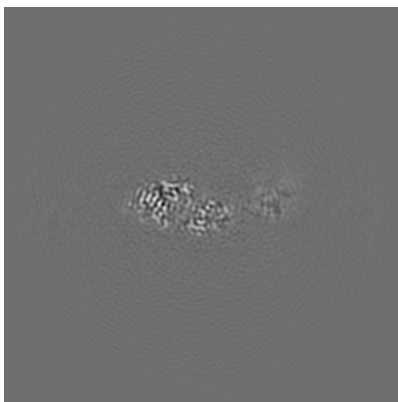
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

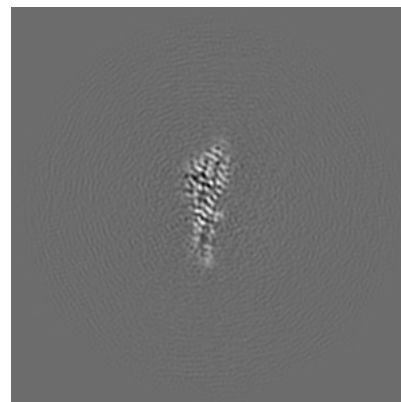
6.3.1 Primary map



X Index: 148

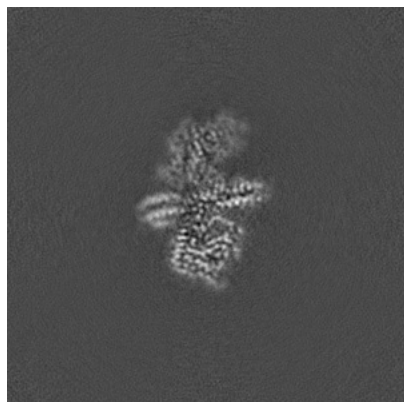


Y Index: 157

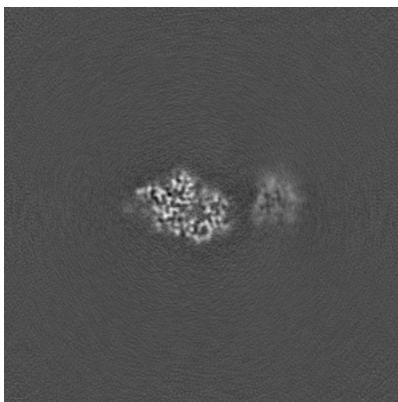


Z Index: 156

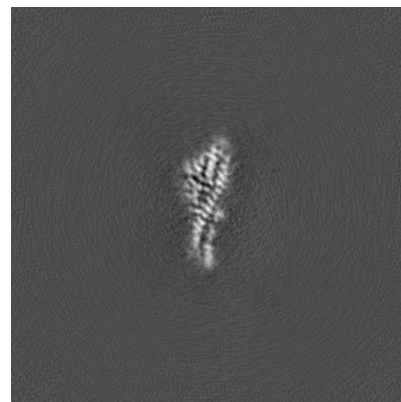
6.3.2 Raw map



X Index: 148



Y Index: 164

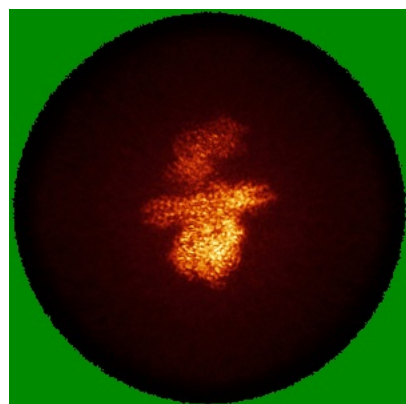


Z Index: 156

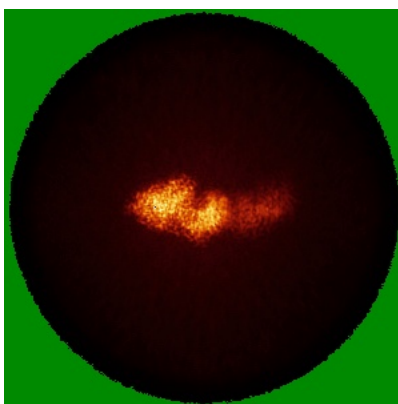
The images above show the largest variance slices of the map in three orthogonal directions.

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

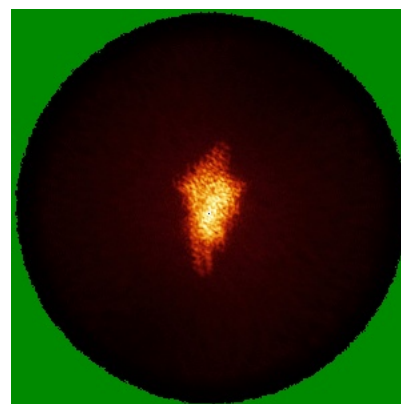
6.4.1 Primary map



X



Y

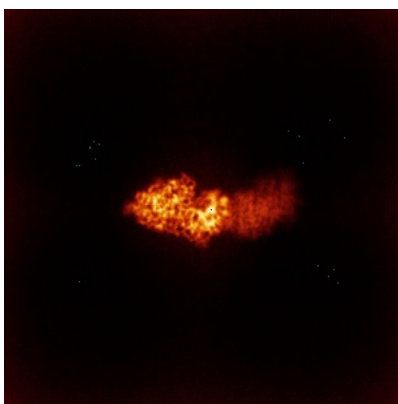


Z

6.4.2 Raw map



X



Y

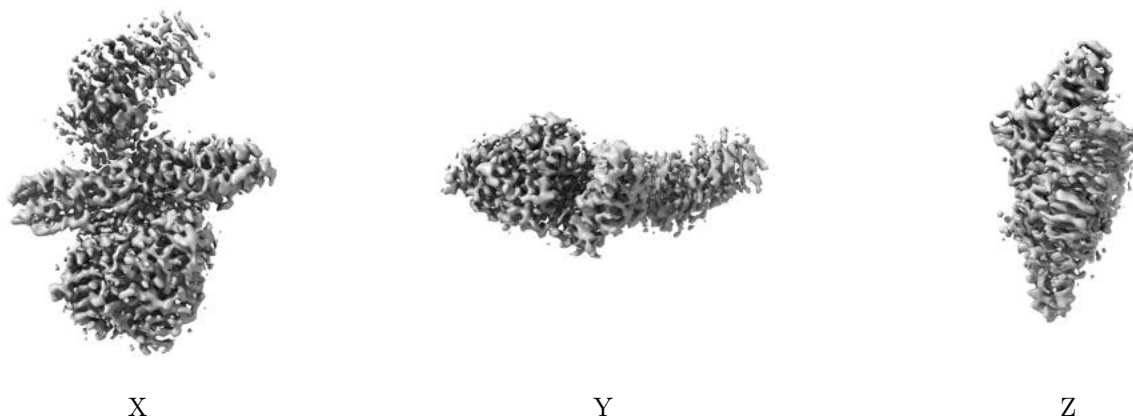


Z

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.

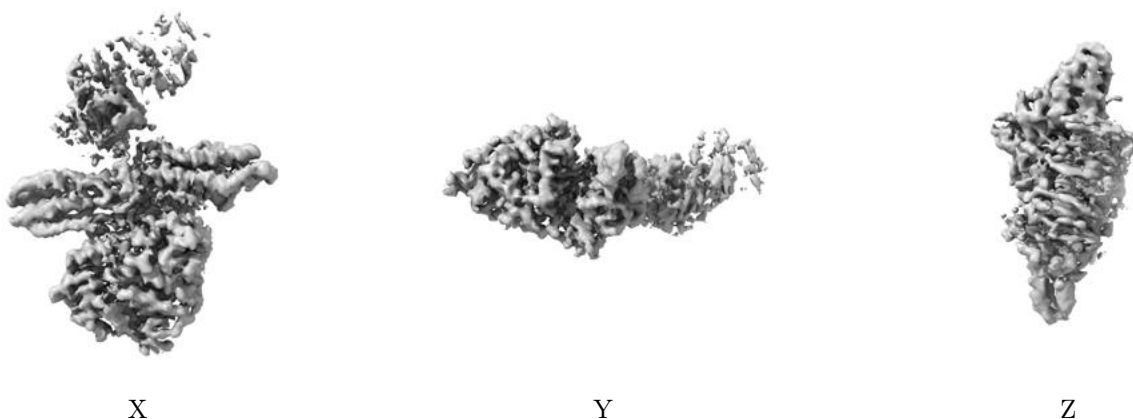
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.252. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

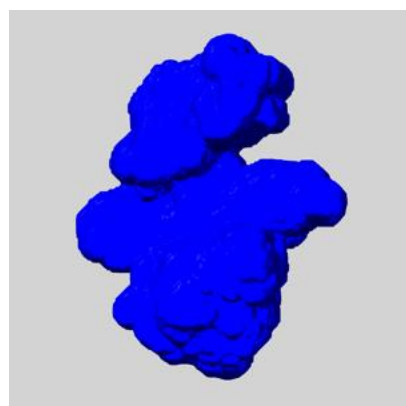
6.6 Mask visualisation [i](#)

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

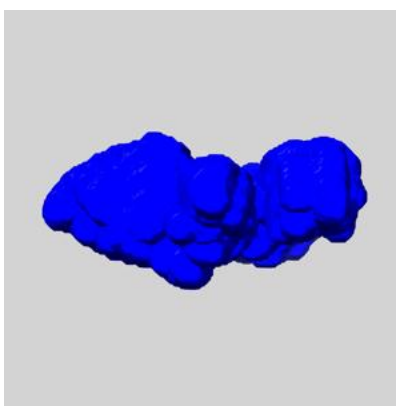
A mask typically either:

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

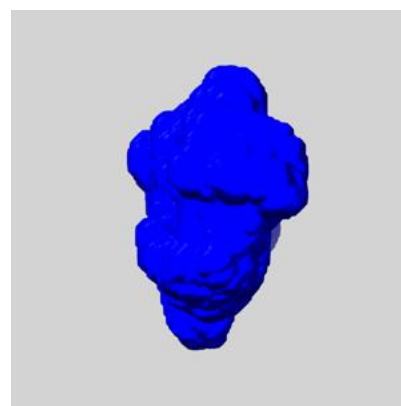
6.6.1 emd_13947_msk_1.map [i](#)



X



Y

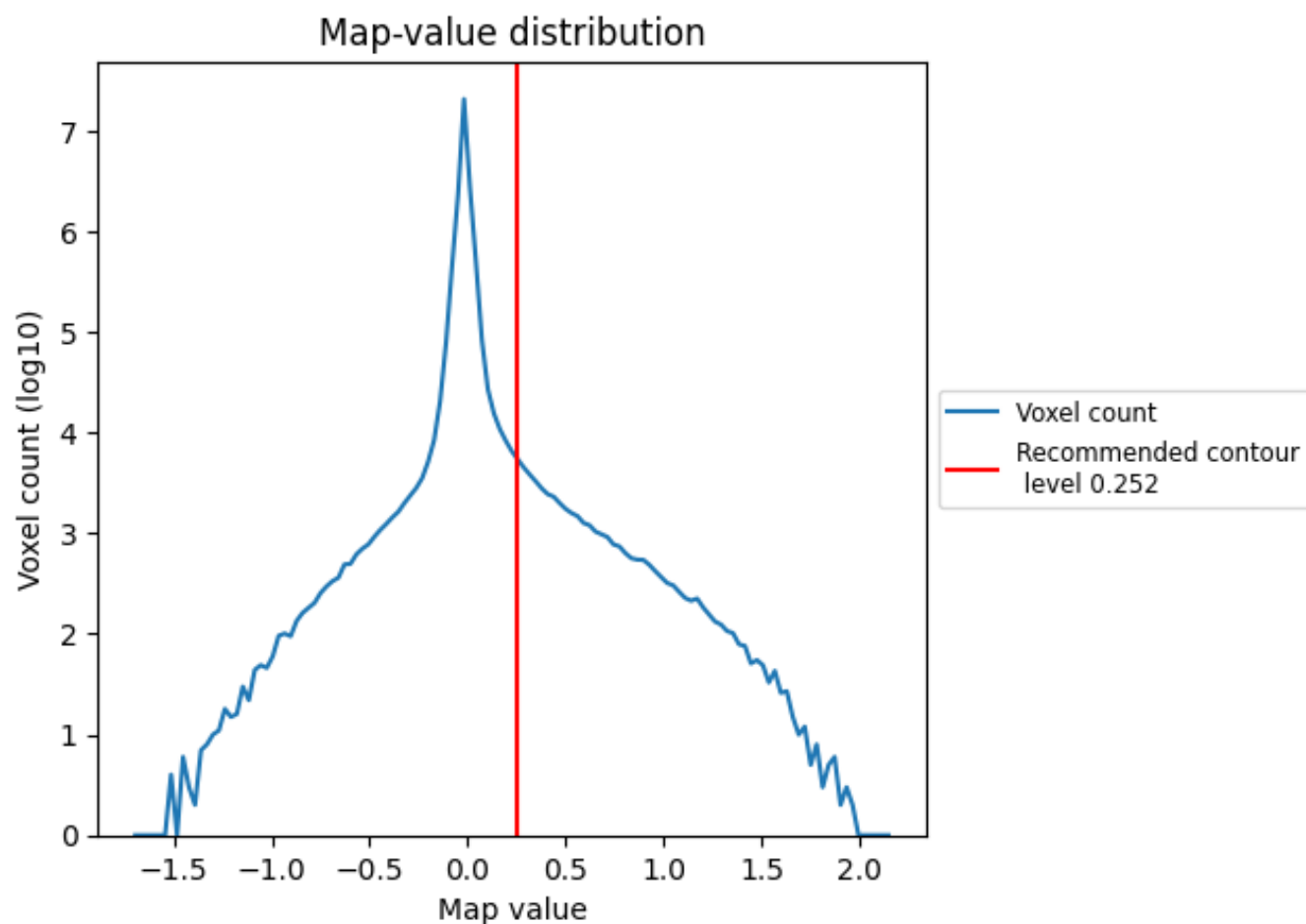


Z

7 Map analysis [i](#)

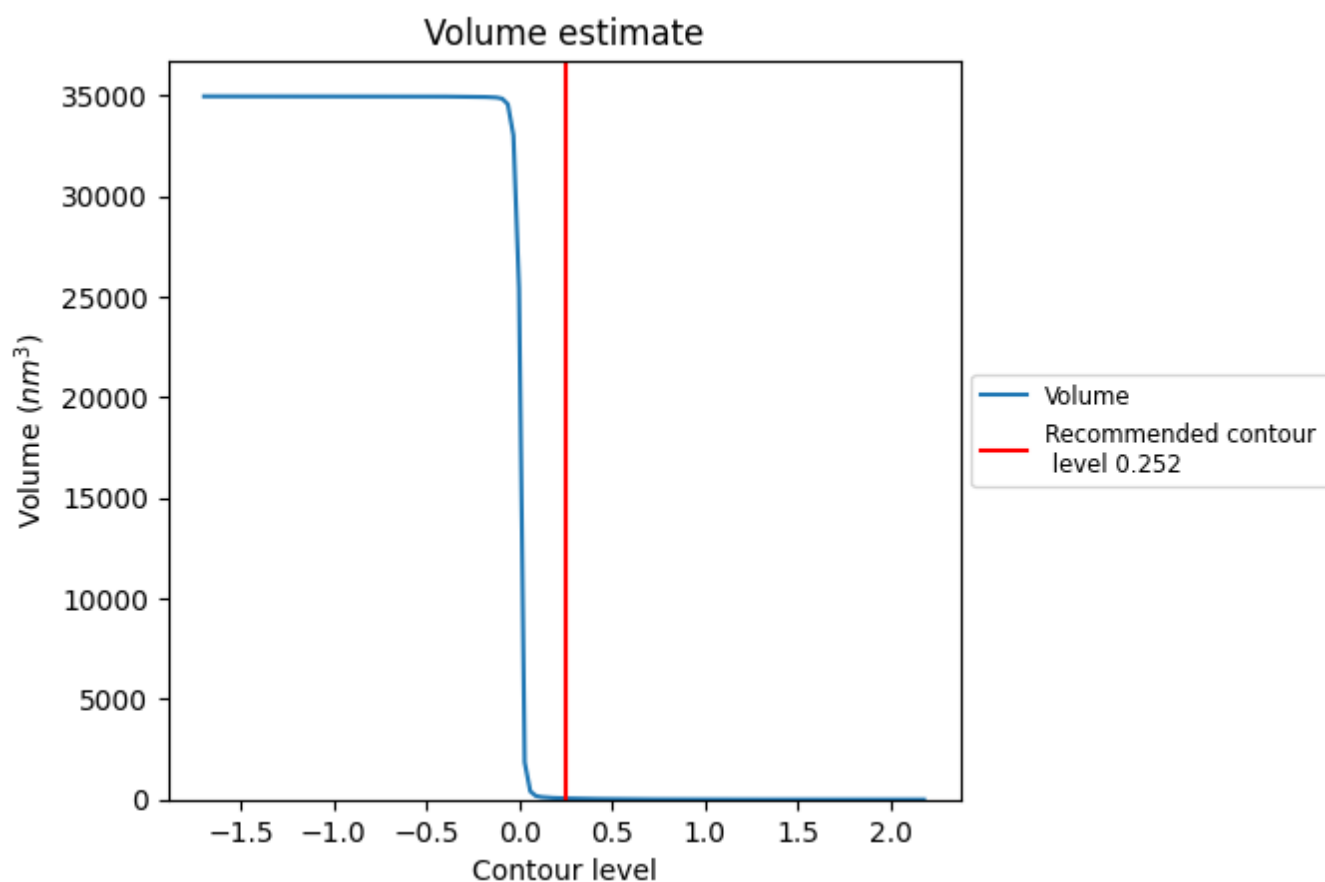
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

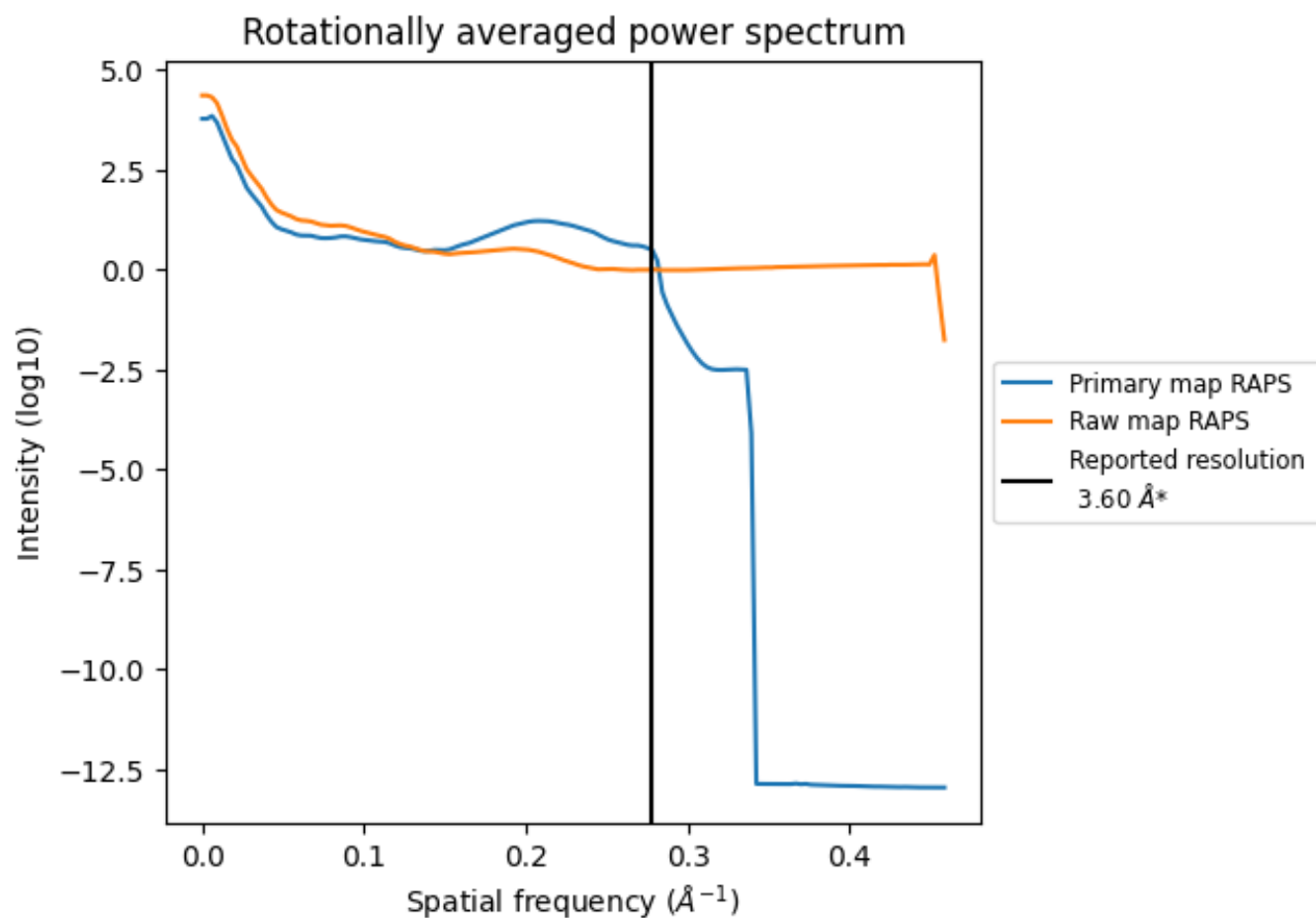
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 60 nm³; this corresponds to an approximate mass of 54 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 ⓘ

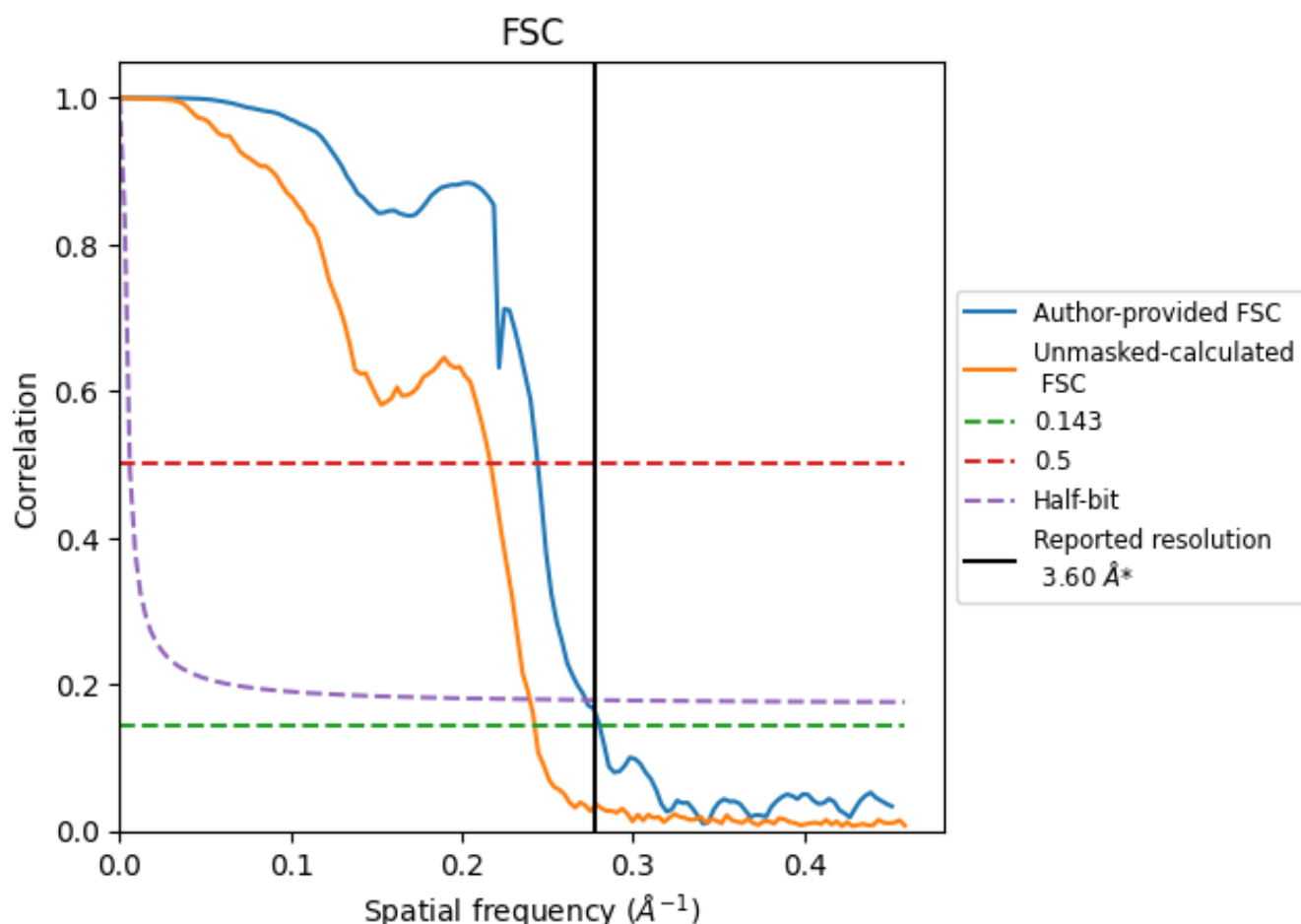


*Reported resolution corresponds to spatial frequency of 0.278 Å⁻¹

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 0.278 \AA^{-1}

8.2 Resolution estimates [i](#)

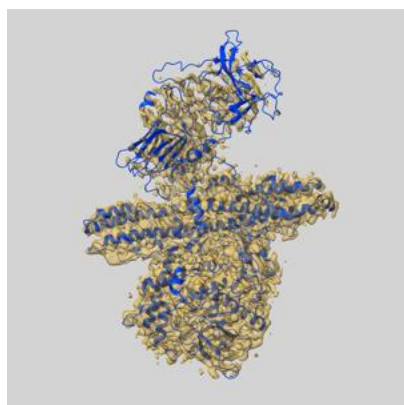
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	3.57	4.09	3.67
Unmasked-calculated*	4.12	4.61	4.17

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.12 differs from the reported value 3.6 by more than 10 %

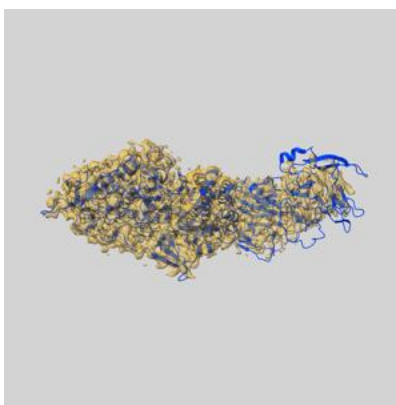
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-13947 and PDB model 7QFQ. Per-residue inclusion information can be found in section [3](#) on page [4](#).

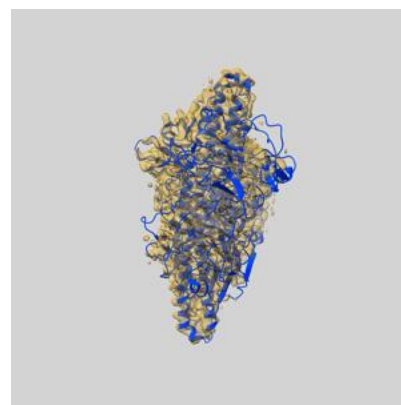
9.1 Map-model overlay [i](#)



X



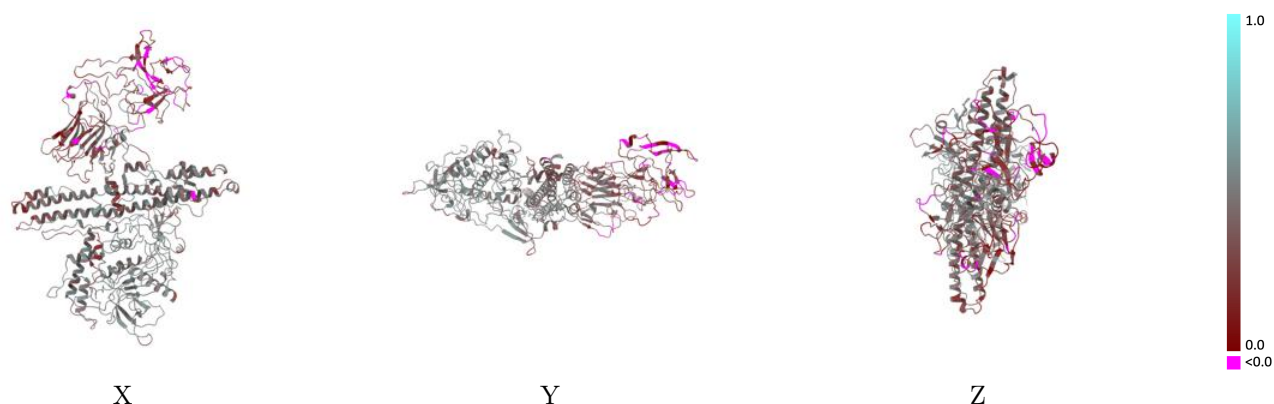
Y



Z

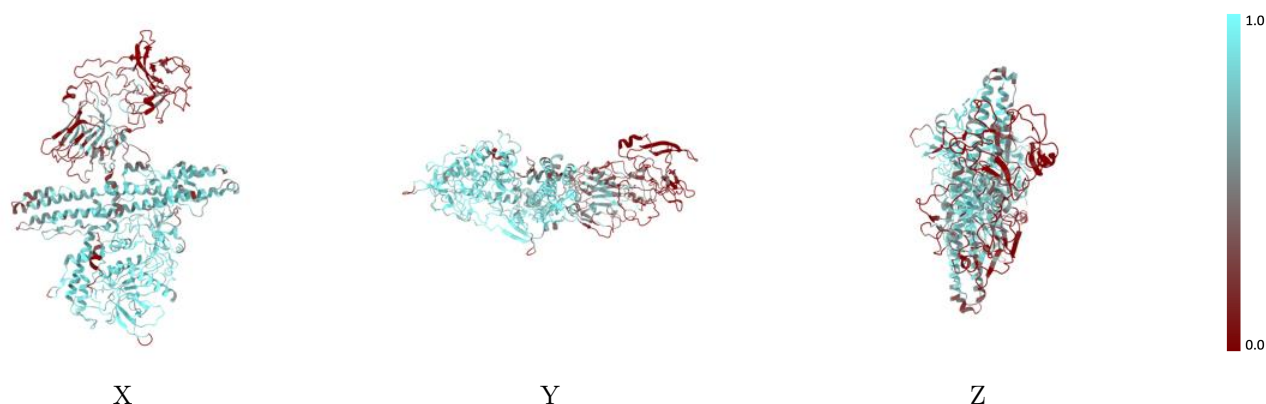
The images above show the 3D surface view of the map at the recommended contour level 0.252 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



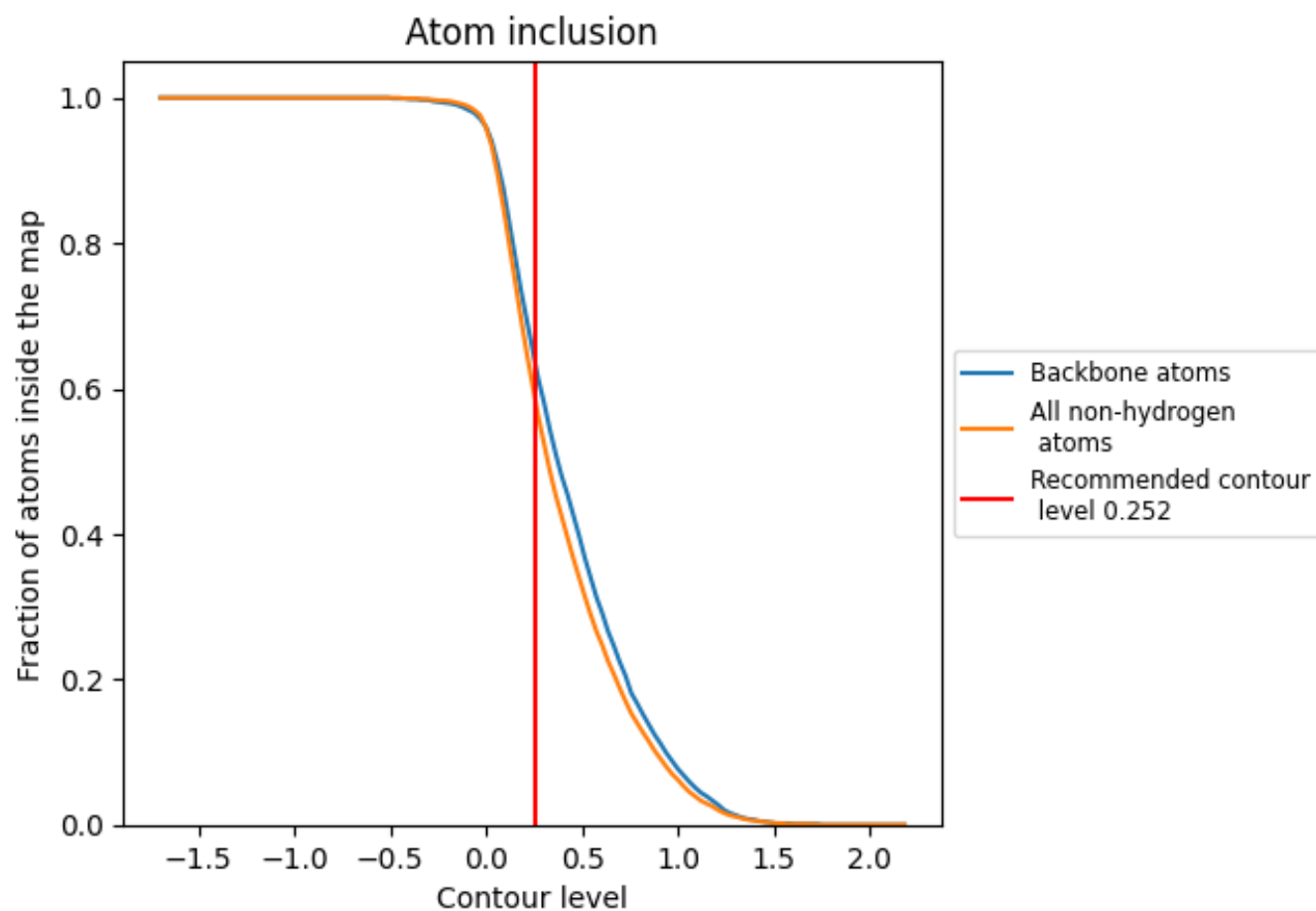
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.252).

9.4 Atom inclusion [i](#)



At the recommended contour level, 64% of all backbone atoms, 59% 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 (0.252) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.5900	<div></div> 0.3800
A	<div></div> 0.5900	<div></div> 0.3800

