Full wwPDB EM Validation Report

Mar 25, 2026 – 01:02 AM UTC

PDB ID	:	8JIS / pdb_00008jis
EMDB ID	:	EMD-36326
Title	:	Cryo-EM structure of the GLP-1R/GCGR dual agonist peptide15-bound human GLP-1R-Gs complex
Authors	:	Yang, L.; Zhou, Q.T.; Dai, A.T.; Zhao, F.H.; Chang, R.L.; Ying, T.L.; Wu, B.L.; Yang, D.H.; Wang, M.W.; Cong, Z.T.
Deposited on	:	2023-05-27
Resolution	:	2.46 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 (i) 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 (i)) were used in the production of this report:

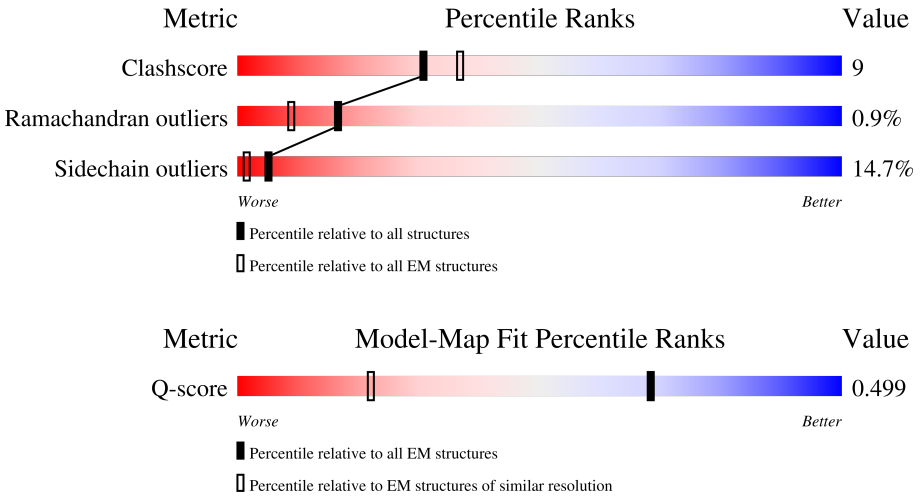
EMDB validation analysis	:	0.0.1.dev132
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 2.46 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	6014 (1.96 - 2.96)

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

Mol	Chain	Length	Quality of chain
1	A	356	45% 18% • 33%
2	B	338	77% 20% • •
3	P	29	83% 10% 7%
4	G	57	12% 77% 16% 7%

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Mol	Chain	Length	Quality of chain
5	N	126	
6	R	394	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 9158 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 Guanine nucleotide-binding protein G(s) subunit alpha isoforms short.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	238	1856	1166	338	344	8	0	0

- Molecule 2 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	338	2572	1591	457	503	21	0	0

- Molecule 3 is a protein called Peptide 15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	P	29	238	152	37	48	1	0	0

- Molecule 4 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	G	57	427	269	74	81	3	0	0

- Molecule 5 is a protein called Nanobody 35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	N	126	961	599	168	188	6	0	0

- Molecule 6 is a protein called Glucagon-like peptide 1 receptor.

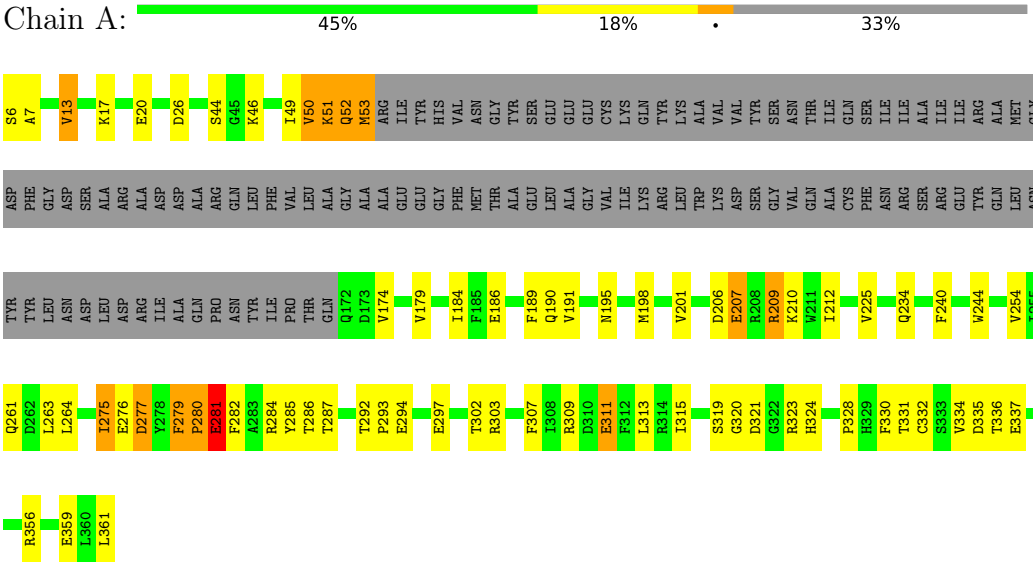
Mol	Chain	Residues	Atoms					AltConf	Trace
6	R	386	Total	C	N	O	S	0	0
			3104	2051	500	535	18		

3 Residue-property plots (i)

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

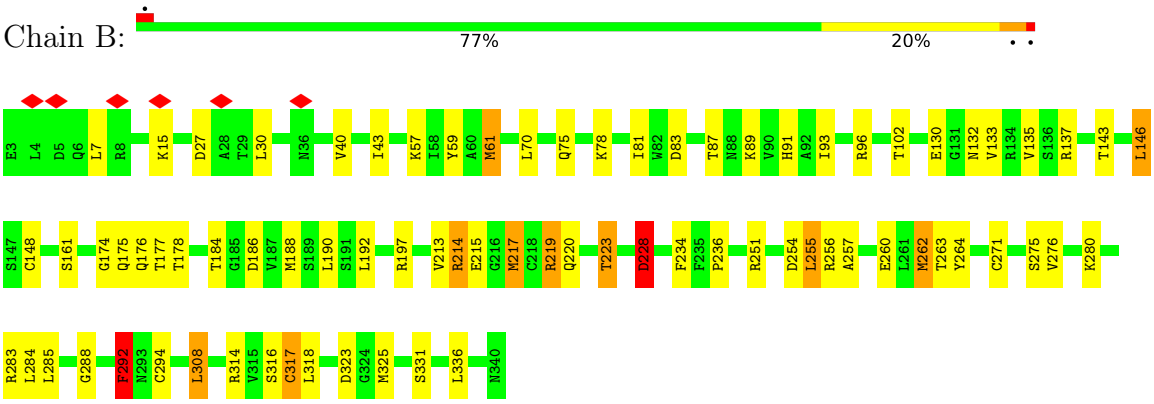
• Molecule 1: Guanine nucleotide-binding protein G(s) subunit alpha isoforms short

Chain A:



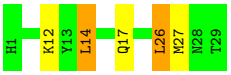
• Molecule 2: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1

Chain B:

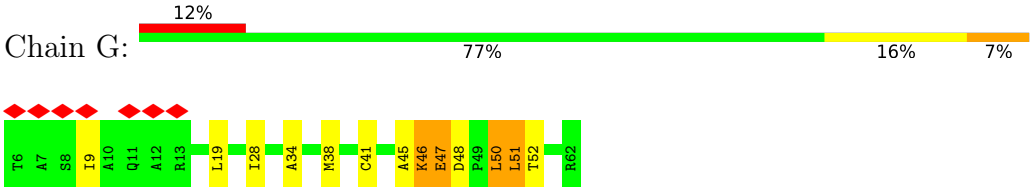


• Molecule 3: Peptide 15

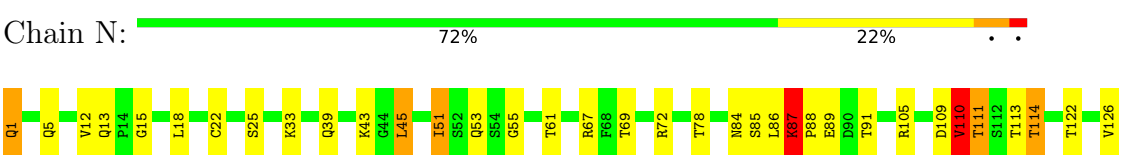
Chain P:



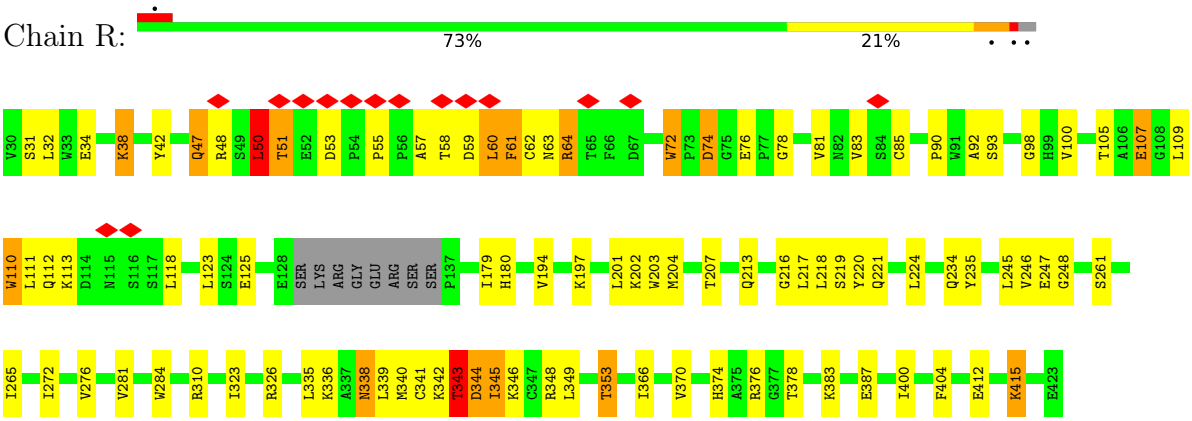
• Molecule 4: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2



• Molecule 5: Nanobody 35



• Molecule 6: Glucagon-like peptide 1 receptor



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1252175	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	80	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.948	Depositor
Minimum map value	-0.515	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.059	Depositor
Map size (Å)	274.176, 274.176, 274.176	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.071, 1.071, 1.071	Depositor

5 Model quality

5.1 Standard geometry

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	0.79	0/1890	0.85	7/2560 (0.3%)
2	B	0.76	0/2619	0.81	9/3555 (0.3%)
3	P	0.55	0/244	0.48	0/329
4	G	0.32	0/433	0.53	0/586
5	N	0.57	0/981	0.87	2/1329 (0.2%)
6	R	0.54	1/3197 (0.0%)	0.78	17/4365 (0.4%)
All	All	0.66	1/9364 (0.0%)	0.80	35/12724 (0.3%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	R	53	ASP	C-N	6.22	1.39	1.33

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	R	374	HIS	N-CA-C	-10.67	99.29	114.12
6	R	344	ASP	N-CA-C	-10.03	101.25	113.19
1	A	281	GLU	N-CA-C	-8.42	101.39	112.34
6	R	345	ILE	N-CA-C	-7.78	102.95	110.42
6	R	93	SER	N-CA-C	-7.29	103.05	112.23
1	A	174	VAL	N-CA-C	-7.22	106.18	113.47
6	R	220	TYR	N-CA-C	-7.19	103.48	111.82
2	B	175	GLN	N-CA-C	7.11	120.59	110.14
6	R	218	LEU	N-CA-C	-6.62	104.47	112.54
1	A	264	LEU	N-CA-C	-6.55	105.03	113.16
6	R	62	CYS	N-CA-C	-6.37	103.47	111.11
5	N	114	THR	N-CA-C	-6.35	106.75	114.75
1	A	294	GLU	CA-C-N	6.22	127.61	119.84
1	A	294	GLU	C-N-CA	6.22	127.61	119.84
5	N	87	LYS	N-CA-C	-6.04	99.13	108.55
6	R	55	PRO	CA-C-N	-6.02	113.77	119.85
6	R	55	PRO	C-N-CA	-6.02	113.77	119.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	R	53	ASP	N-CA-C	5.96	118.94	109.40
6	R	53	ASP	CA-C-N	-5.94	115.33	119.66
6	R	53	ASP	C-N-CA	-5.94	115.33	119.66
2	B	323	ASP	N-CA-C	-5.90	106.05	113.72
1	A	207	GLU	N-CA-C	5.59	117.20	109.15
2	B	176	GLN	N-CA-C	-5.59	102.21	110.48
1	A	7	ALA	N-CA-C	-5.54	106.56	113.55
6	R	48	ARG	N-CA-C	-5.54	105.32	111.36
6	R	76	GLU	CA-C-N	-5.50	112.96	119.84
6	R	76	GLU	C-N-CA	-5.50	112.96	119.84
2	B	288	GLY	N-CA-C	-5.49	102.50	110.90
2	B	331	SER	N-CA-C	5.42	117.03	108.96
6	R	50	LEU	N-CA-C	-5.38	106.72	113.28
2	B	174	GLY	N-CA-C	-5.31	107.36	115.00
2	B	228	ASP	N-CA-C	5.22	117.88	110.10
2	B	175	GLN	N-CA-CB	-5.07	103.14	110.70
6	R	51	THR	N-CA-C	-5.05	106.80	113.12
2	B	292	PHE	N-CA-C	5.04	119.28	113.38

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	1856	0	1751	51	0
2	B	2572	0	2462	42	0
3	P	238	0	219	2	0
4	G	427	0	435	11	0
5	N	961	0	930	18	0
6	R	3104	0	3014	47	0
All	All	9158	0	8811	160	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 9.

All (160) 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:292:THR:O	1:A:292:THR:HG23	1.66	0.94
5:N:45:LEU:HB3	5:N:110:VAL:HG22	1.53	0.91
1:A:53:MET:HG3	1:A:189:PHE:HB2	1.61	0.82
1:A:53:MET:HG3	1:A:189:PHE:CB	2.12	0.79
2:B:130:GLU:OE1	2:B:132:ASN:HB2	1.82	0.79
6:R:179:ILE:HG22	6:R:247:GLU:OE1	1.83	0.78
1:A:337:GLU:HG2	1:A:337:GLU:O	1.85	0.74
6:R:343:THR:C	6:R:345:ILE:H	1.96	0.70
1:A:280:PRO:C	1:A:282:PHE:N	2.41	0.69
6:R:180:HIS:CE1	6:R:247:GLU:OE2	2.48	0.66
1:A:277:ASP:C	1:A:279:PHE:H	2.02	0.66
4:G:47:GLU:HA	4:G:47:GLU:OE2	1.94	0.66
6:R:335:LEU:HA	6:R:338:ASN:HB2	1.77	0.65
6:R:342:LYS:C	6:R:344:ASP:H	2.04	0.65
2:B:130:GLU:OE2	2:B:132:ASN:HB3	1.97	0.64
6:R:343:THR:C	6:R:345:ILE:N	2.49	0.64
2:B:130:GLU:OE2	2:B:132:ASN:CB	2.46	0.64
1:A:26:ASP:OD2	2:B:78:LYS:NZ	2.27	0.64
1:A:292:THR:O	1:A:292:THR:CG2	2.40	0.62
2:B:81:ILE:HD13	2:B:91:HIS:HB2	1.82	0.61
6:R:412:GLU:HA	6:R:415:LYS:HE2	1.82	0.61
2:B:283:ARG:HB3	4:G:51:LEU:HD21	1.84	0.59
1:A:49:ILE:O	1:A:53:MET:HG2	2.03	0.58
2:B:254:ASP:HB3	2:B:257:ALA:HB3	1.85	0.58
6:R:180:HIS:HE1	6:R:247:GLU:OE2	1.85	0.58
6:R:63:ASN:HB2	6:R:74:ASP:HA	1.84	0.58
2:B:276:VAL:HG13	2:B:285:LEU:HD11	1.86	0.57
4:G:46:LYS:HD2	4:G:46:LYS:O	2.05	0.57
2:B:284:LEU:HD12	4:G:50:LEU:HB3	1.86	0.56
1:A:275:ILE:C	1:A:277:ASP:H	2.14	0.56
2:B:236:PRO:HG3	2:B:280:LYS:O	2.06	0.56
2:B:292:PHE:CD1	2:B:292:PHE:N	2.71	0.55
3:P:26:LEU:HD23	3:P:27:MET:HG2	1.89	0.55
5:N:109:ASP:C	5:N:111:THR:H	2.14	0.55
2:B:219:ARG:HB2	2:B:220:GLN:OE1	2.06	0.54
4:G:41:CYS:O	4:G:45:ALA:HB2	2.08	0.54
1:A:337:GLU:O	1:A:337:GLU:CG	2.55	0.54
2:B:255:LEU:HD23	2:B:255:LEU:N	2.22	0.54
2:B:280:LYS:HB3	4:G:48:ASP:CB	2.37	0.54
1:A:280:PRO:C	1:A:282:PHE:H	2.13	0.54
2:B:27:ASP:N	2:B:27:ASP:OD1	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:197:ARG:HH21	2:B:214:ARG:HG3	1.73	0.54
1:A:209:ARG:HG2	1:A:210:LYS:HG2	1.88	0.54
1:A:280:PRO:O	1:A:281:GLU:C	2.51	0.54
6:R:179:ILE:CG2	6:R:247:GLU:OE1	2.54	0.53
1:A:20:GLU:OE2	2:B:89:LYS:NZ	2.35	0.53
6:R:110:TRP:HA	6:R:110:TRP:CE3	2.44	0.53
2:B:251:ARG:HG2	2:B:263:THR:HG22	1.91	0.53
1:A:52:GLN:HB3	1:A:53:MET:SD	2.49	0.52
1:A:53:MET:HG3	1:A:189:PHE:HB3	1.90	0.52
1:A:225:VAL:CG1	1:A:258:LEU:HD23	2.39	0.52
5:N:12:VAL:HG13	5:N:126:VAL:HG23	1.90	0.52
6:R:64:ARG:HE	6:R:72:TRP:HE1	1.57	0.52
1:A:256:LEU:HB3	1:A:328:PRO:HA	1.91	0.51
1:A:311:GLU:OE2	1:A:311:GLU:HA	2.10	0.51
2:B:262:MET:HB3	2:B:264:TYR:CE1	2.46	0.50
6:R:201:LEU:HA	6:R:204:MET:HG3	1.93	0.50
2:B:130:GLU:CD	2:B:132:ASN:HB2	2.36	0.50
1:A:240:PHE:HE1	1:A:254:VAL:HG21	1.77	0.50
6:R:90:PRO:C	6:R:92:ALA:H	2.18	0.50
6:R:224:LEU:HD23	6:R:224:LEU:O	2.11	0.50
6:R:342:LYS:C	6:R:344:ASP:N	2.70	0.50
6:R:342:LYS:O	6:R:344:ASP:N	2.45	0.50
5:N:39:GLN:HB2	5:N:45:LEU:HD13	1.93	0.50
1:A:13:VAL:O	1:A:17:LYS:HG3	2.12	0.49
2:B:57:LYS:HG3	2:B:75:GLN:HG3	1.95	0.49
5:N:105:ARG:NE	5:N:105:ARG:HA	2.28	0.49
6:R:349:LEU:O	6:R:353:THR:OG1	2.30	0.49
1:A:44:SER:O	1:A:44:SER:OG	2.29	0.49
1:A:49:ILE:HD12	1:A:198:MET:HE1	1.94	0.48
1:A:50:VAL:HB	1:A:51:LYS:HZ3	1.78	0.48
1:A:280:PRO:HB2	1:A:307:PHE:CE1	2.49	0.48
6:R:213:GLN:OE1	6:R:216:GLY:N	2.36	0.47
1:A:309:ARG:HG2	1:A:309:ARG:O	2.13	0.47
2:B:148:CYS:HB3	2:B:190:LEU:HD23	1.96	0.47
5:N:51:ILE:HG23	5:N:55:GLY:HA2	1.97	0.47
2:B:217:MET:HB2	2:B:217:MET:HE2	1.67	0.47
1:A:50:VAL:O	1:A:51:LYS:C	2.55	0.46
6:R:98:GLY:HA3	6:R:125:GLU:HB3	1.97	0.46
1:A:285:TYR:O	1:A:303:ARG:NH1	2.49	0.46
6:R:113:LYS:HB2	6:R:118:LEU:HD21	1.96	0.46
1:A:353:MET:HE3	1:A:353:MET:HB3	1.64	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:46:LYS:HE2	4:G:46:LYS:HB3	1.71	0.46
5:N:13:GLN:OE1	5:N:13:GLN:HA	2.15	0.46
5:N:43:LYS:NZ	5:N:43:LYS:HB3	2.30	0.46
6:R:60:LEU:HD13	6:R:60:LEU:HA	1.80	0.46
1:A:313:LEU:HD21	1:A:328:PRO:HG3	1.97	0.46
5:N:87:LYS:HB3	5:N:87:LYS:HE3	1.61	0.46
1:A:280:PRO:O	1:A:282:PHE:N	2.49	0.46
6:R:123:LEU:HD12	6:R:123:LEU:C	2.41	0.46
1:A:244:TRP:HE1	1:A:320:GLY:H	1.64	0.45
6:R:335:LEU:HA	6:R:338:ASN:HD22	1.81	0.45
1:A:340:ARG:HE	1:A:340:ARG:HB2	1.67	0.45
1:A:46:LYS:O	1:A:50:VAL:HG22	2.16	0.45
6:R:90:PRO:C	6:R:92:ALA:N	2.75	0.45
2:B:130:GLU:CD	2:B:132:ASN:CB	2.90	0.45
2:B:223:THR:HG21	5:N:1:GLN:HG2	1.99	0.44
6:R:235:TYR:HA	6:R:281:VAL:HG21	1.98	0.44
1:A:244:TRP:HZ3	1:A:254:VAL:HG22	1.83	0.44
2:B:30:LEU:HD23	2:B:262:MET:HB2	1.99	0.44
6:R:248:GLY:O	6:R:323:ILE:HG21	2.17	0.44
6:R:110:TRP:HA	6:R:110:TRP:HE3	1.83	0.43
1:A:50:VAL:O	1:A:53:MET:N	2.50	0.43
2:B:256:ARG:HB3	4:G:28:ILE:HG12	2.00	0.43
2:B:292:PHE:N	2:B:292:PHE:HD1	2.16	0.43
6:R:201:LEU:HA	6:R:201:LEU:HD12	1.89	0.43
1:A:352:ARG:HH12	6:R:338:ASN:CG	2.26	0.43
5:N:18:LEU:HD12	5:N:18:LEU:HA	1.83	0.43
5:N:86:LEU:HB3	5:N:126:VAL:HG21	2.01	0.43
2:B:146:LEU:HD22	2:B:146:LEU:HA	1.82	0.43
2:B:262:MET:HB3	2:B:264:TYR:HE1	1.83	0.43
2:B:294:CYS:HB2	2:B:308:LEU:HG	2.01	0.43
6:R:107:GLU:H	6:R:107:GLU:HG3	1.46	0.43
2:B:214:ARG:H	2:B:214:ARG:HG2	1.69	0.43
2:B:220:GLN:OE1	2:B:220:GLN:N	2.52	0.43
5:N:53:GLN:OE1	5:N:53:GLN:N	2.49	0.43
1:A:244:TRP:HE1	1:A:320:GLY:N	2.16	0.43
2:B:217:MET:H	2:B:217:MET:HG3	1.67	0.43
3:P:14:LEU:HD12	3:P:14:LEU:HA	1.76	0.43
1:A:190:GLN:NE2	1:A:195:ASN:OD1	2.52	0.42
6:R:272:ILE:HA	6:R:276:VAL:HG23	2.01	0.42
1:A:277:ASP:C	1:A:279:PHE:N	2.65	0.42
1:A:261:GLN:HG3	1:A:330:PHE:HB3	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:R:345:ILE:H	6:R:345:ILE:HG12	1.65	0.42
1:A:210:LYS:HZ3	2:B:228:ASP:CG	2.28	0.42
6:R:57:ALA:HB3	6:R:61:PHE:HB3	2.02	0.42
2:B:40:VAL:HG11	2:B:43:ILE:HD11	2.02	0.42
6:R:47:GLN:HA	6:R:50:LEU:HB2	2.01	0.42
1:A:315:ILE:O	1:A:315:ILE:HG22	2.20	0.42
2:B:61:MET:HG3	2:B:317:CYS:HB2	2.02	0.42
6:R:235:TYR:HB2	6:R:281:VAL:HG11	2.01	0.42
6:R:246:VAL:O	6:R:246:VAL:HG12	2.20	0.42
5:N:88:PRO:HA	5:N:126:VAL:CG1	2.50	0.41
6:R:234:GLN:HG3	6:R:284:TRP:CZ3	2.55	0.41
6:R:245:LEU:HD12	6:R:245:LEU:O	2.19	0.41
2:B:61:MET:HE2	2:B:61:MET:HB2	1.88	0.41
2:B:137:ARG:HD3	2:B:137:ARG:HA	1.84	0.41
1:A:293:PRO:HB3	1:A:302:THR:HG21	2.01	0.41
6:R:85:CYS:HB2	6:R:98:GLY:O	2.20	0.41
6:R:338:ASN:O	6:R:340:MET:N	2.54	0.41
4:G:34:ALA:O	4:G:38:MET:HG3	2.21	0.41
2:B:15:LYS:HG3	4:G:19:LEU:HD21	2.03	0.41
4:G:52:THR:O	4:G:52:THR:OG1	2.37	0.41
6:R:38:LYS:HE2	6:R:38:LYS:HB2	1.44	0.41
2:B:83:ASP:O	2:B:87:THR:N	2.54	0.41
5:N:15:GLY:HA2	5:N:85:SER:HA	2.02	0.41
6:R:340:MET:O	6:R:341:CYS:C	2.62	0.41
6:R:400:ILE:HA	6:R:404:PHE:CD2	2.55	0.41
6:R:203:TRP:HA	6:R:207:THR:OG1	2.21	0.41
6:R:326:ARG:HA	6:R:326:ARG:HD2	1.84	0.41
1:A:209:ARG:HE	1:A:209:ARG:HB3	1.52	0.40
1:A:280:PRO:HG2	1:A:307:PHE:HE1	1.85	0.40
1:A:234:GLN:HG2	5:N:61:THR:HG23	2.02	0.40
1:A:263:LEU:HD23	1:A:263:LEU:HA	1.91	0.40
1:A:275:ILE:HG13	1:A:276:GLU:H	1.87	0.40
5:N:109:ASP:C	5:N:111:THR:N	2.77	0.40
1:A:337:GLU:OE1	1:A:337:GLU:N	2.50	0.40
2:B:93:ILE:HG12	2:B:133:VAL:HG21	2.02	0.40
5:N:51:ILE:HG21	5:N:72:ARG:HG2	2.02	0.40
6:R:213:GLN:HE22	6:R:217:LEU:N	2.19	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	234/356 (66%)	210 (90%)	20 (8%)	4 (2%)	7 6
2	B	336/338 (99%)	320 (95%)	16 (5%)	0	100 100
3	P	27/29 (93%)	26 (96%)	1 (4%)	0	100 100
4	G	55/57 (96%)	54 (98%)	1 (2%)	0	100 100
5	N	124/126 (98%)	114 (92%)	9 (7%)	1 (1%)	16 20
6	R	382/394 (97%)	344 (90%)	33 (9%)	5 (1%)	9 9
All	All	1158/1300 (89%)	1068 (92%)	80 (7%)	10 (1%)	16 17

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	277	ASP
1	A	280	PRO
1	A	284	ARG
6	R	339	LEU
1	A	279	PHE
6	R	343	THR
6	R	58	THR
5	N	110	VAL
6	R	366	ILE
6	R	78	GLY

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	188/312 (60%)	154 (82%)	34 (18%)	2 1
2	B	275/281 (98%)	238 (86%)	37 (14%)	4 3
3	P	25/25 (100%)	21 (84%)	4 (16%)	2 1
4	G	44/46 (96%)	39 (89%)	5 (11%)	5 5
5	N	104/104 (100%)	85 (82%)	19 (18%)	2 1
6	R	327/354 (92%)	284 (87%)	43 (13%)	4 3
All	All	963/1122 (86%)	821 (85%)	142 (15%)	5 2

All (142) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	SER
1	A	13	VAL
1	A	50	VAL
1	A	51	LYS
1	A	52	GLN
1	A	53	MET
1	A	179	VAL
1	A	184	ILE
1	A	186	GLU
1	A	191	VAL
1	A	201	VAL
1	A	206	ASP
1	A	207	GLU
1	A	209	ARG
1	A	212	ILE
1	A	275	ILE
1	A	281	GLU
1	A	286	THR
1	A	287	THR
1	A	297	GLU
1	A	311	GLU
1	A	319	SER
1	A	321	ASP
1	A	323	ARG
1	A	324	HIS
1	A	331	THR
1	A	332	CYS
1	A	334	VAL
1	A	335	ASP
1	A	336	THR

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Mol	Chain	Res	Type
1	A	353	MET
1	A	356	ARG
1	A	359	GLU
1	A	361	LEU
2	B	7	LEU
2	B	59	TYR
2	B	61	MET
2	B	70	LEU
2	B	96	ARG
2	B	102	THR
2	B	135	VAL
2	B	143	THR
2	B	146	LEU
2	B	161	SER
2	B	177	THR
2	B	178	THR
2	B	184	THR
2	B	186	ASP
2	B	188	MET
2	B	192	LEU
2	B	213	VAL
2	B	214	ARG
2	B	215	GLU
2	B	217	MET
2	B	219	ARG
2	B	223	THR
2	B	228	ASP
2	B	234	PHE
2	B	255	LEU
2	B	260	GLU
2	B	262	MET
2	B	271	CYS
2	B	275	SER
2	B	292	PHE
2	B	308	LEU
2	B	314	ARG
2	B	316	SER
2	B	317	CYS
2	B	318	LEU
2	B	325	MET
2	B	336	LEU
3	P	12	LYS

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Mol	Chain	Res	Type
3	P	14	LEU
3	P	17	GLN
3	P	26	LEU
4	G	9	ILE
4	G	46	LYS
4	G	47	GLU
4	G	50	LEU
4	G	51	LEU
5	N	1	GLN
5	N	5	GLN
5	N	22	CYS
5	N	25	SER
5	N	33	LYS
5	N	45	LEU
5	N	51	ILE
5	N	67	ARG
5	N	69	THR
5	N	78	THR
5	N	84	ASN
5	N	87	LYS
5	N	89	GLU
5	N	91	THR
5	N	110	VAL
5	N	111	THR
5	N	113	THR
5	N	114	THR
5	N	122	THR
6	R	31	SER
6	R	32	LEU
6	R	34	GLU
6	R	38	LYS
6	R	42	TYR
6	R	47	GLN
6	R	50	LEU
6	R	51	THR
6	R	59	ASP
6	R	60	LEU
6	R	61	PHE
6	R	64	ARG
6	R	72	TRP
6	R	74	ASP
6	R	81	VAL

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Mol	Chain	Res	Type
6	R	83	VAL
6	R	100	VAL
6	R	105	THR
6	R	107	GLU
6	R	109	LEU
6	R	110	TRP
6	R	111	LEU
6	R	112	GLN
6	R	194	VAL
6	R	197	LYS
6	R	202	LYS
6	R	219	SER
6	R	221	GLN
6	R	261	SER
6	R	265	ILE
6	R	310	ARG
6	R	336	LYS
6	R	338	ASN
6	R	343	THR
6	R	346	LYS
6	R	348	ARG
6	R	353	THR
6	R	370	VAL
6	R	376	ARG
6	R	378	THR
6	R	383	LYS
6	R	387	GLU
6	R	415	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	216	ASN
1	A	234	GLN
2	B	13	GLN
2	B	91	HIS
2	B	156	GLN
2	B	293	ASN
4	G	44	HIS
6	R	177	ASN
6	R	180	HIS
6	R	406	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

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

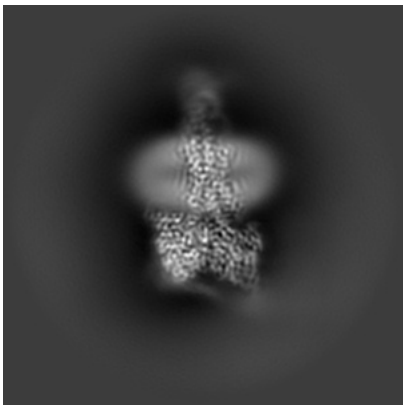
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-36326. These allow visual inspection of the internal detail of the map and identification of artifacts.

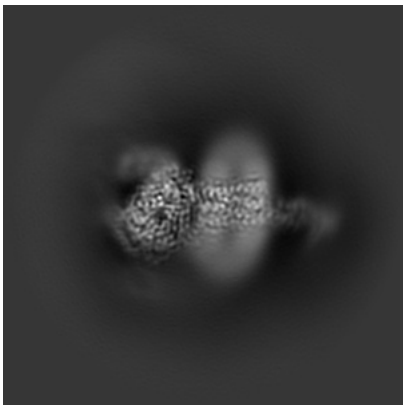
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

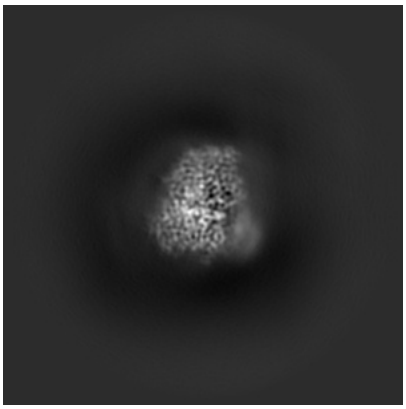
6.1.1 Primary map



X

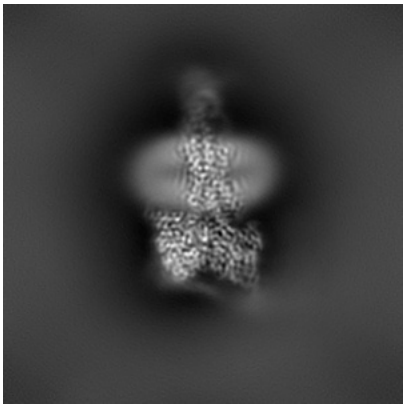


Y



Z

6.1.2 Raw map



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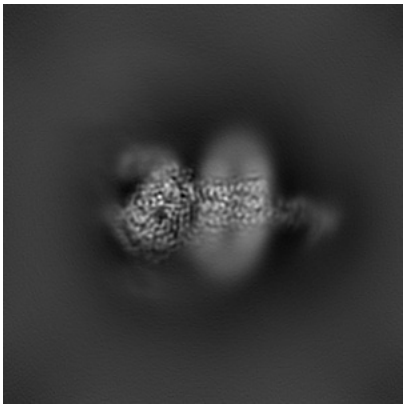
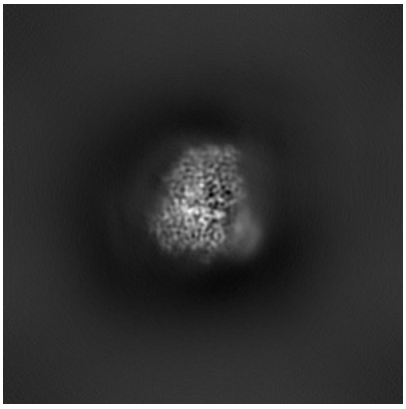


Y

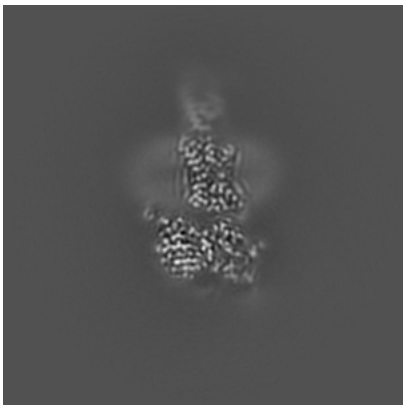


Z

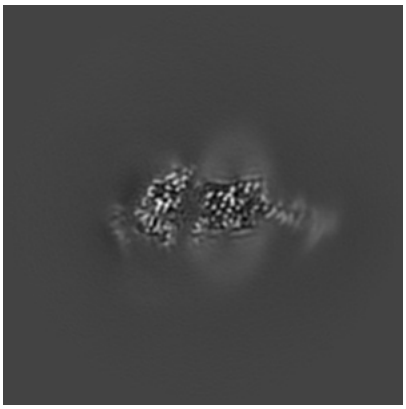
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

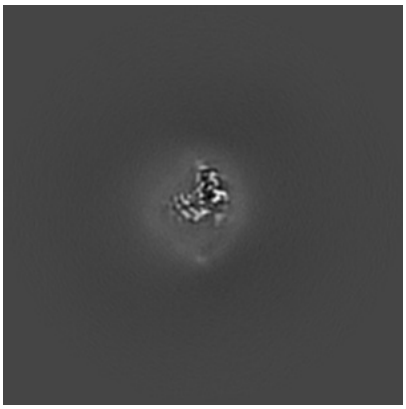
6.2.1 Primary map



X Index: 128

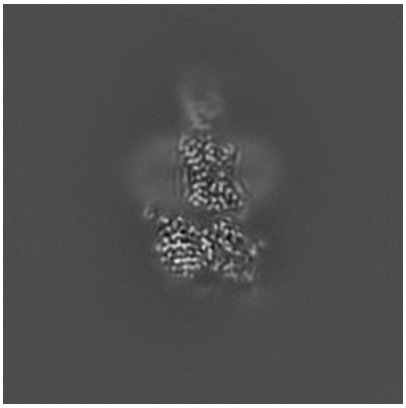


Y Index: 128

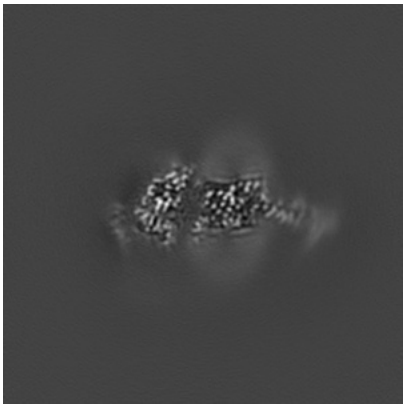


Z Index: 128

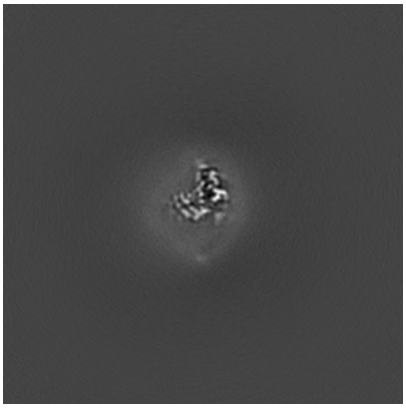
6.2.2 Raw map



X Index: 128



Y Index: 128

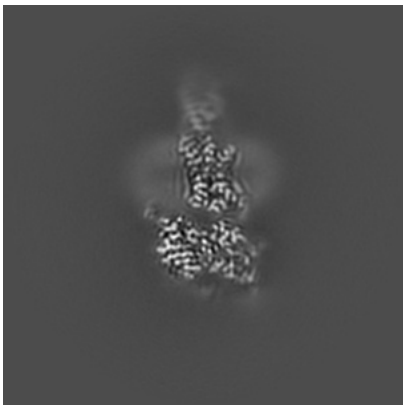


Z Index: 128

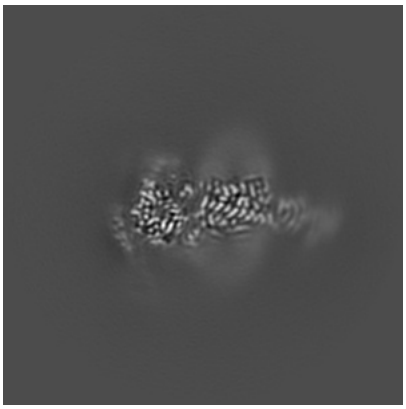
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

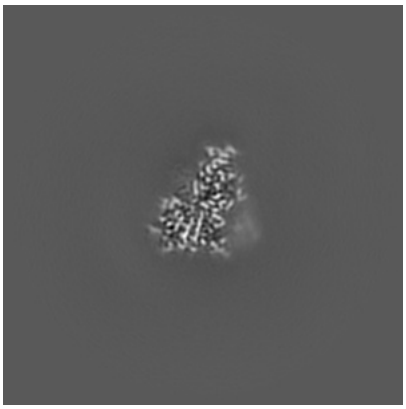
6.3.1 Primary map



X Index: 127

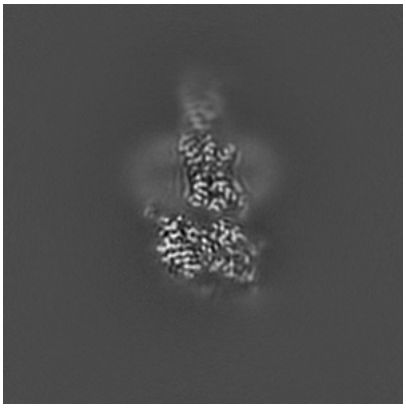


Y Index: 123

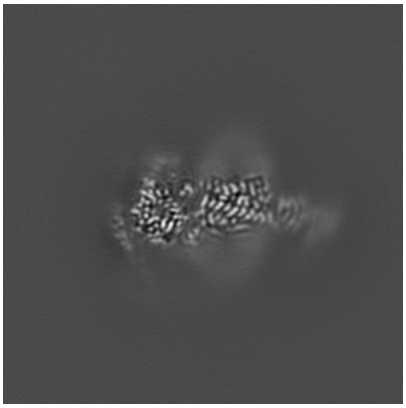


Z Index: 105

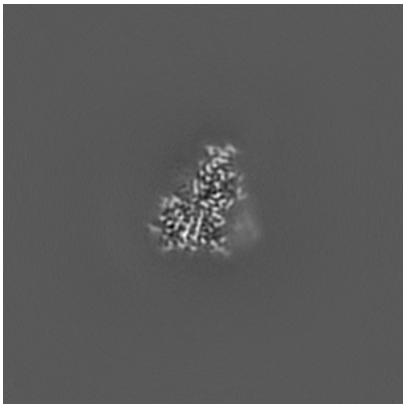
6.3.2 Raw map



X Index: 127



Y Index: 123

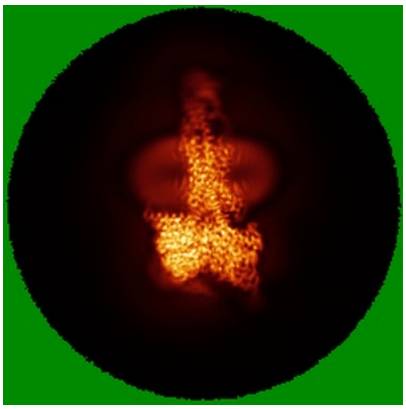


Z Index: 105

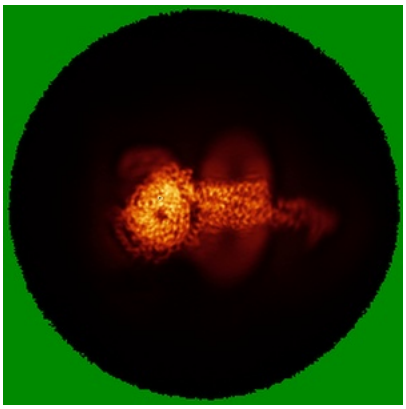
The images above show the largest variance slices of the map in three orthogonal directions.

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

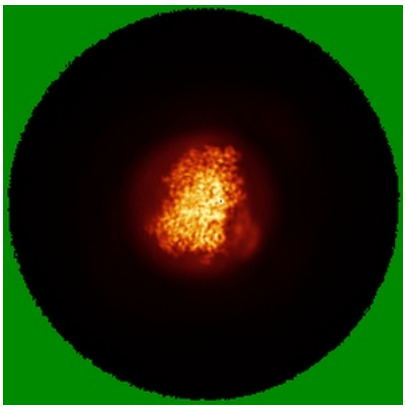
6.4.1 Primary map



X

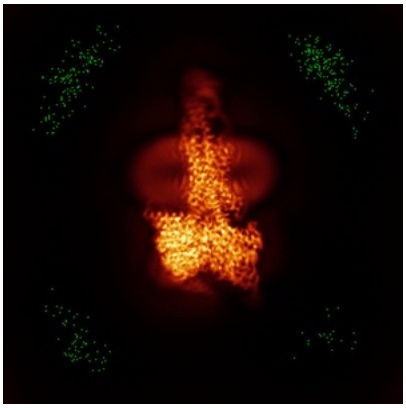


Y

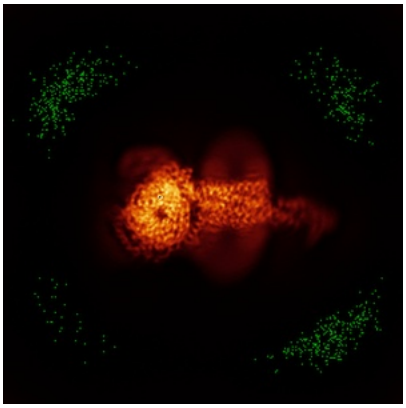


Z

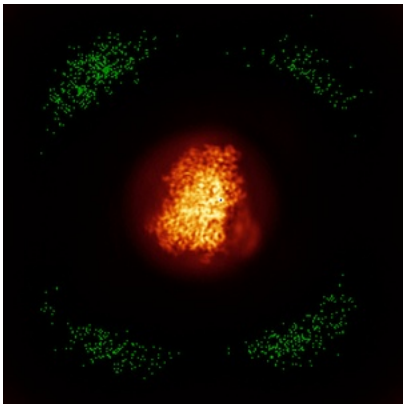
6.4.2 Raw map



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 0.059. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z

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

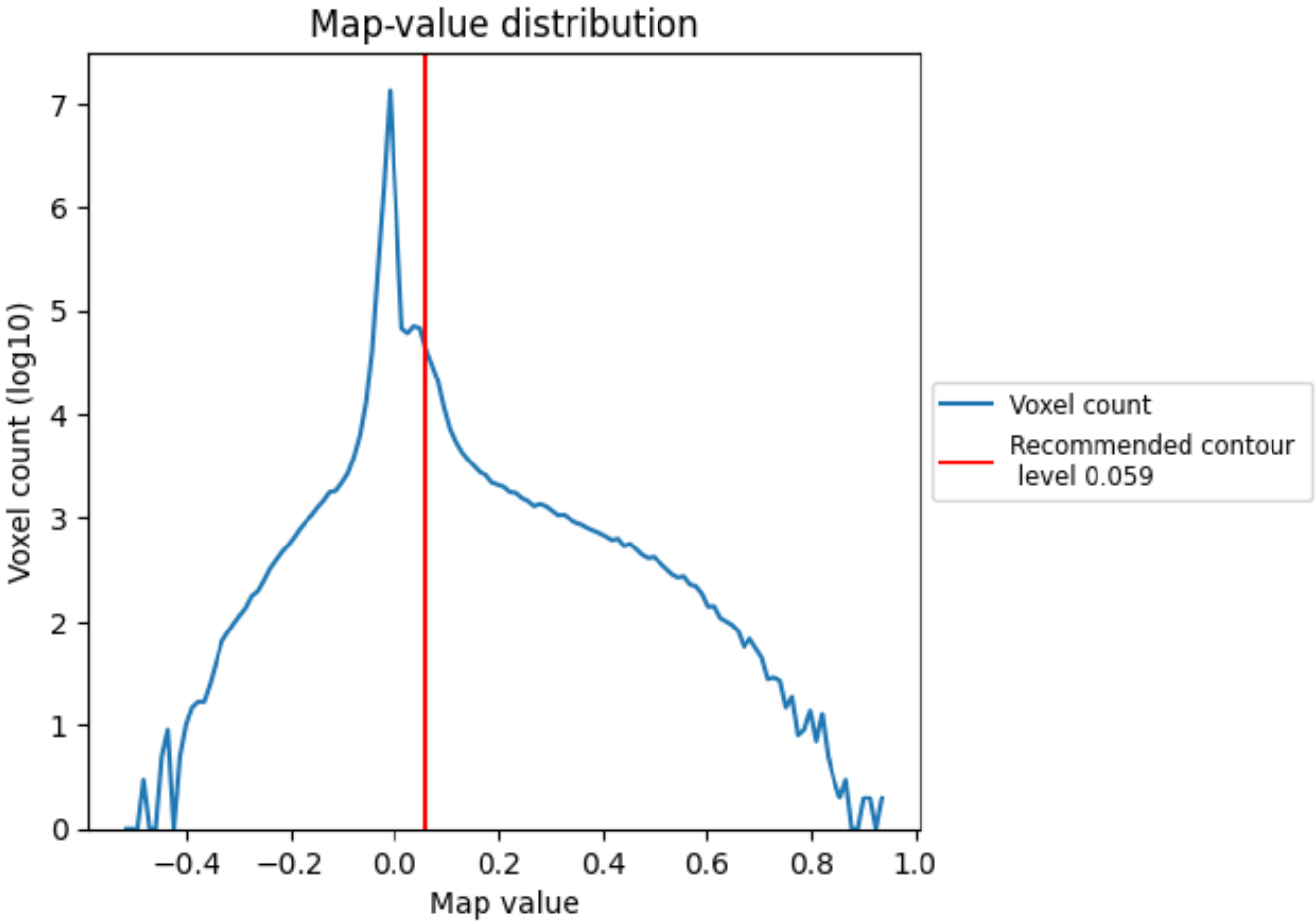
6.6 Mask visualisation (i)

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

7 Map analysis

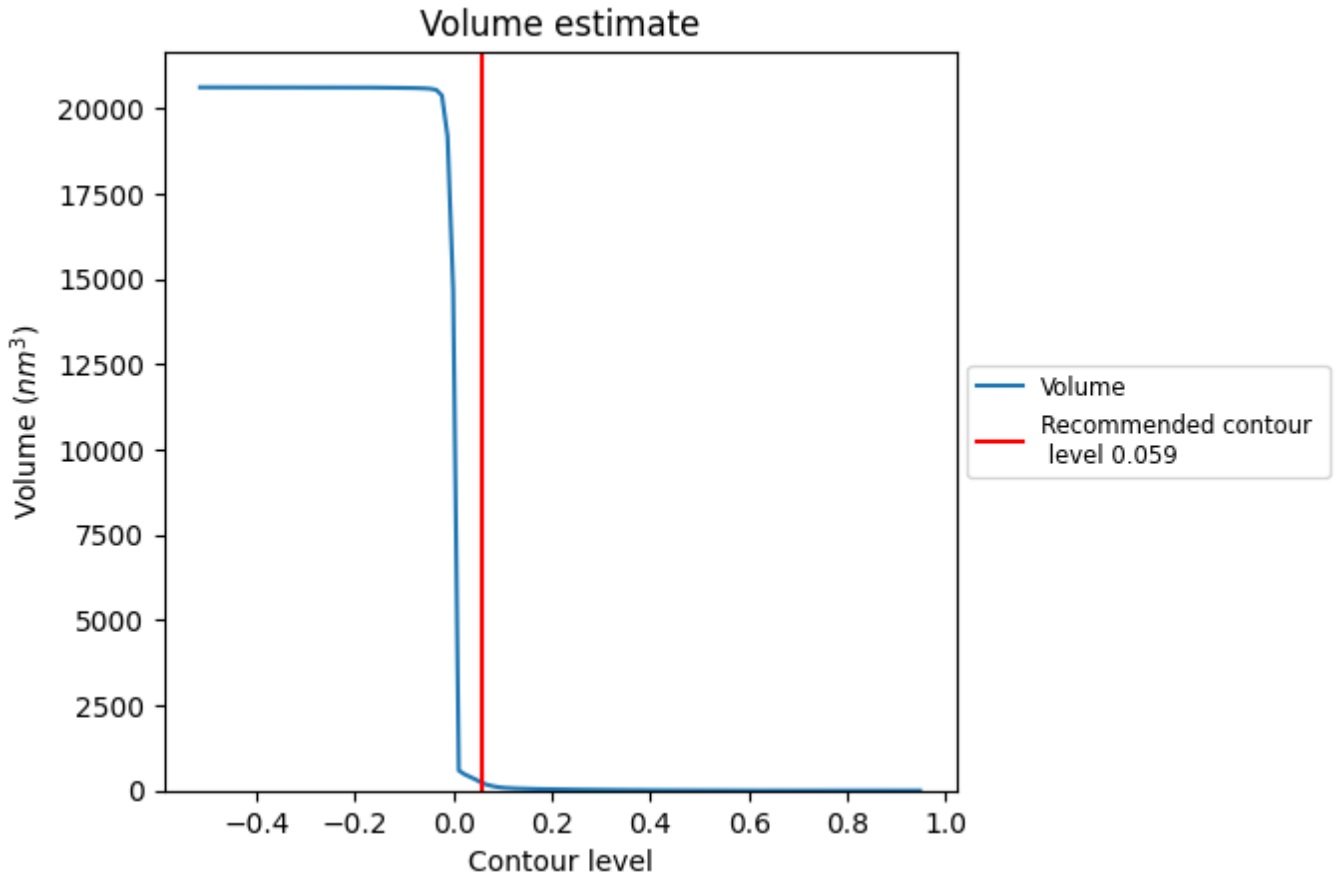
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

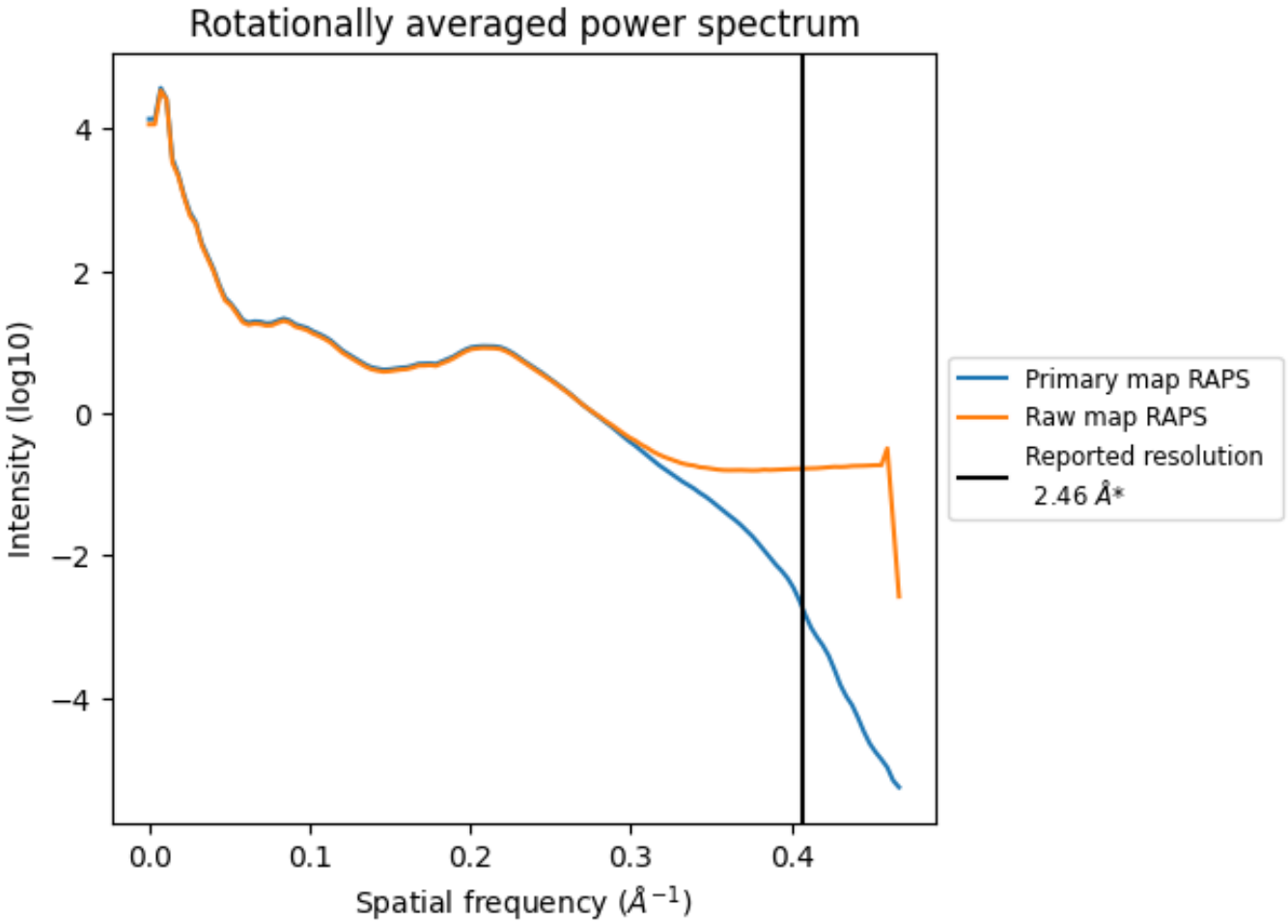
7.2 Volume estimate (i)



The volume at the recommended contour level is 220 nm^3; this corresponds to an approximate mass of 199 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)

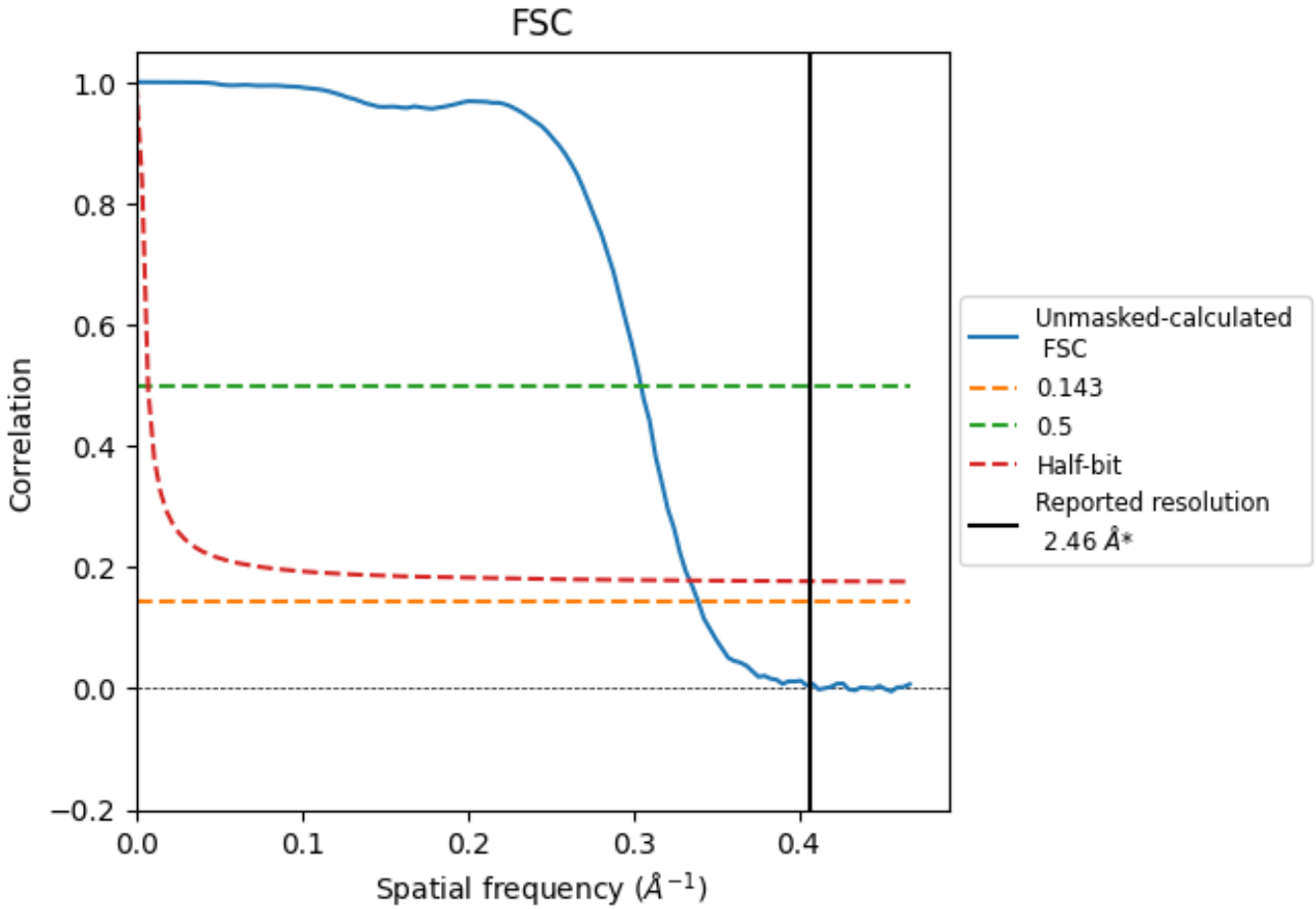


*Reported resolution corresponds to spatial frequency of 0.407 $Å^{-1}$

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.407 Å^{-1}

8.2 Resolution estimates (i)

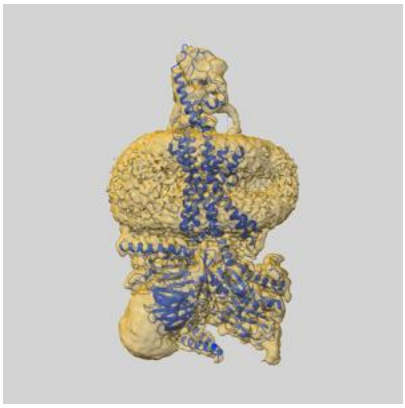
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.46	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	2.95	3.28	2.99

*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 2.95 differs from the reported value 2.46 by more than 10 %

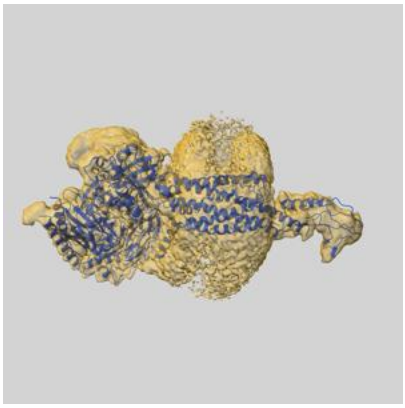
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-36326 and PDB model 8JIS. Per-residue inclusion information can be found in section 3 on page 6.

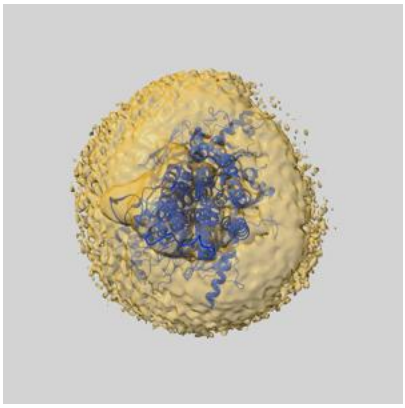
9.1 Map-model overlay



X



Y



Z

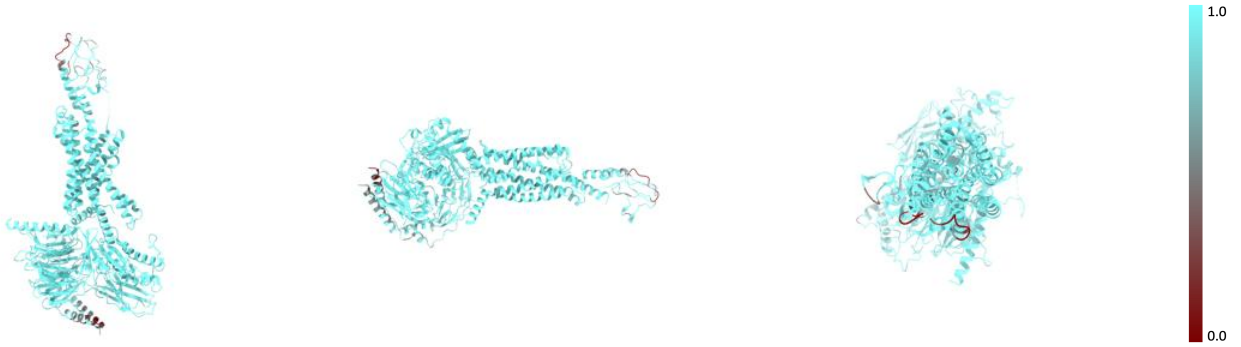
The images above show the 3D surface view of the map at the recommended contour level 0.059 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)

X Y Z

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

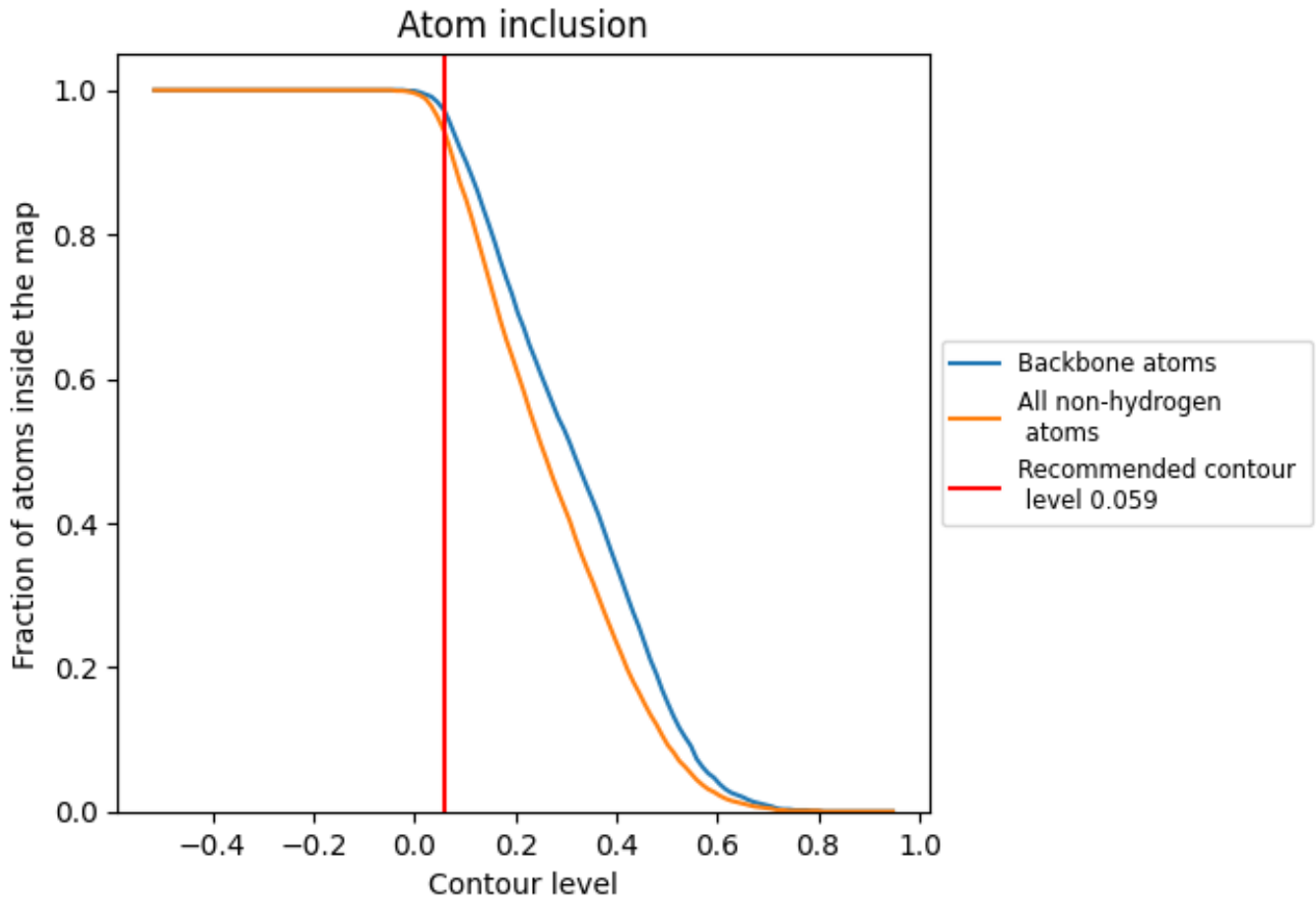
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.059).

9.4 Atom inclusion (i)



At the recommended contour level, 97% of all backbone atoms, 94% 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 (0.059) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9430	0.4990
A	0.9820	0.5460
B	0.9540	0.5420
G	0.7870	0.4390
N	0.9640	0.5080
P	0.9530	0.4620
R	0.9240	0.4440