



Full wwPDB EM Validation Report ⓘ

Dec 6, 2023 – 02:44 PM JST

PDB ID : 8HJ5
EMDB ID : EMD-34833
Title : Cryo-EM structure of Gq-coupled MRGPRX1 bound with Compound-16
Authors : Gan, B.; Yu, L.Y.; Ren, R.B.
Deposited on : 2022-11-22
Resolution : 3.00 Å (reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

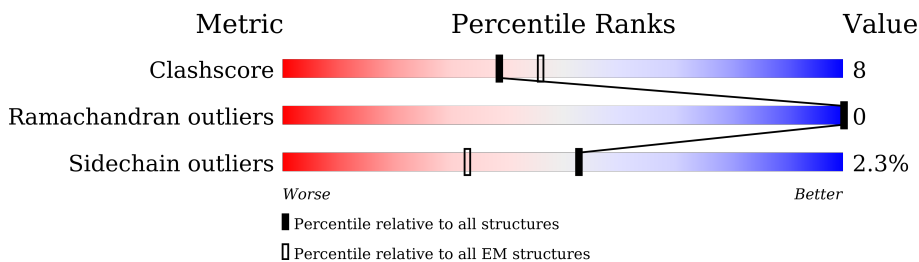
EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.00 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	A	362	 8% 56% 9% 36%
2	B	384	 8% 73% 15% 12%
3	D	71	 8% 65% 7% 28%
4	C	259	 8% 75% 14% 10%
5	F	637	 8% 33% 6% 60%
6	E	157	 8% 57% 23% 19%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9678 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(q) subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	233	1913	1208	339	357	9	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	337	2591	1599	466	505	21	0	0

There are 45 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1	HIS	-	expression tag	UNP P62873
B	2	HIS	-	expression tag	UNP P62873
B	3	HIS	-	expression tag	UNP P62873
B	4	HIS	-	expression tag	UNP P62873
B	5	HIS	-	expression tag	UNP P62873
B	6	HIS	-	expression tag	UNP P62873
B	7	HIS	-	expression tag	UNP P62873
B	8	HIS	-	expression tag	UNP P62873
B	9	HIS	-	expression tag	UNP P62873
B	10	HIS	-	expression tag	UNP P62873
B	11	LEU	-	expression tag	UNP P62873
B	12	GLU	-	linker	UNP P62873
B	13	VAL	-	linker	UNP P62873
B	14	LEU	-	linker	UNP P62873
B	15	PHE	-	linker	UNP P62873
B	16	GLN	-	linker	UNP P62873
B	17	GLY	-	linker	UNP P62873
B	18	PRO	-	linker	UNP P62873
B	19	GLY	-	linker	UNP P62873
B	20	SER	-	linker	UNP P62873

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Chain	Residue	Modelled	Actual	Comment	Reference
B	21	SER	-	linker	UNP P62873
B	22	GLY	-	linker	UNP P62873
B	362	GLY	-	linker	UNP P62873
B	363	ALA	-	linker	UNP P62873
B	364	SER	-	linker	UNP P62873
B	365	GLY	-	linker	UNP P62873
B	366	ALA	-	linker	UNP P62873
B	367	SER	-	linker	UNP P62873
B	368	GLY	-	linker	UNP P62873
B	369	ALA	-	linker	UNP P62873
B	370	SER	-	linker	UNP P62873
B	371	GLY	-	linker	UNP P62873
B	372	ALA	-	linker	UNP P62873
B	373	SER	-	linker	UNP P62873
B	374	VAL	-	expression tag	UNP P62873
B	375	SER	-	expression tag	UNP P62873
B	376	GLY	-	expression tag	UNP P62873
B	377	TRP	-	expression tag	UNP P62873
B	378	ARG	-	expression tag	UNP P62873
B	379	LEU	-	expression tag	UNP P62873
B	380	PHE	-	expression tag	UNP P62873
B	381	LYS	-	expression tag	UNP P62873
B	382	LYS	-	expression tag	UNP P62873
B	383	ILE	-	expression tag	UNP P62873
B	384	SER	-	expression tag	UNP P62873

- Molecule 3 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	51	Total	C	N	O	S	0	0
			394	248	68	75	3		

- Molecule 4 is a protein called scFv16.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	C	232	Total	C	N	O	S	0	0
			1781	1130	295	346	10		

- Molecule 5 is a protein called Soluble cytochrome b562,Mas-related G-protein coupled receptor member X1,LgBit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	252	2001	1347	318	320	16	0	0

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-139	MET	-	initiating methionine	UNP P0ABE7
F	-138	LYS	-	expression tag	UNP P0ABE7
F	-137	THR	-	expression tag	UNP P0ABE7
F	-136	ILE	-	expression tag	UNP P0ABE7
F	-135	ILE	-	expression tag	UNP P0ABE7
F	-134	ALA	-	expression tag	UNP P0ABE7
F	-133	LEU	-	expression tag	UNP P0ABE7
F	-132	SER	-	expression tag	UNP P0ABE7
F	-131	TYR	-	expression tag	UNP P0ABE7
F	-130	ILE	-	expression tag	UNP P0ABE7
F	-129	PHE	-	expression tag	UNP P0ABE7
F	-128	CYS	-	expression tag	UNP P0ABE7
F	-127	LEU	-	expression tag	UNP P0ABE7
F	-126	VAL	-	expression tag	UNP P0ABE7
F	-125	PHE	-	expression tag	UNP P0ABE7
F	-124	ALA	-	expression tag	UNP P0ABE7
F	-123	ASP	-	expression tag	UNP P0ABE7
F	-122	TYR	-	expression tag	UNP P0ABE7
F	-121	LYS	-	expression tag	UNP P0ABE7
F	-120	ASP	-	expression tag	UNP P0ABE7
F	-119	ASP	-	expression tag	UNP P0ABE7
F	-118	ASP	-	expression tag	UNP P0ABE7
F	-117	ASP	-	expression tag	UNP P0ABE7
F	-116	LYS	-	expression tag	UNP P0ABE7
F	-115	LEU	-	expression tag	UNP P0ABE7
F	-114	GLU	-	expression tag	UNP P0ABE7
F	-113	VAL	-	expression tag	UNP P0ABE7
F	-112	LEU	-	expression tag	UNP P0ABE7
F	-111	PHE	-	expression tag	UNP P0ABE7
F	-110	GLN	-	expression tag	UNP P0ABE7
F	-109	GLY	-	expression tag	UNP P0ABE7
F	-108	PRO	-	expression tag	UNP P0ABE7
F	-107	GLY	-	expression tag	UNP P0ABE7
F	-106	SER	-	expression tag	UNP P0ABE7
F	-105	ALA	-	expression tag	UNP P0ABE7
F	-99	TRP	MET	engineered mutation	UNP P0ABE7
F	-4	ILE	HIS	engineered mutation	UNP P0ABE7

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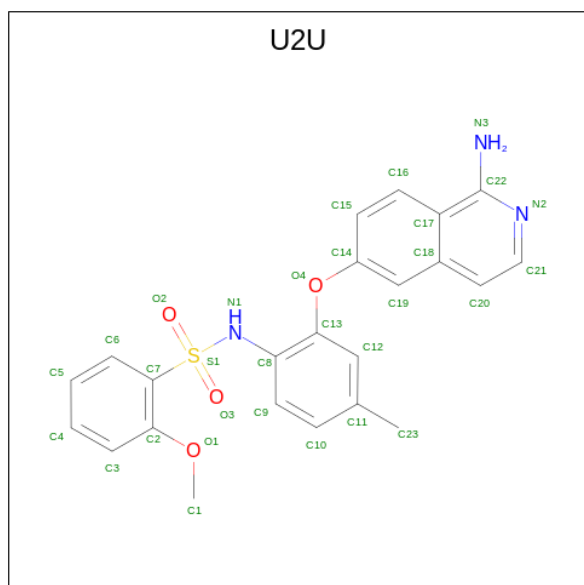
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Chain	Residue	Modelled	Actual	Comment	Reference
F	0	LEU	ARG	engineered mutation	UNP P0ABE7

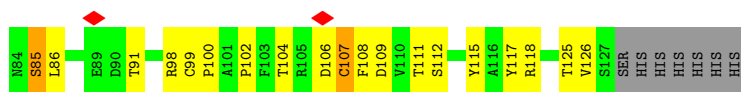
- Molecule 6 is a protein called Nb35.

Mol	Chain	Residues	Atoms				AltConf	Trace	
			Total	C	N	O			S
6	E	127	967	602	169	190	6	0	0

- Molecule 7 is N-{2-[(1-aminoisoquinolin-6-yl)oxy]-4-methylphenyl}-2-methoxybenzene-1-sulfonamide (three-letter code: U2U) (formula: C₂₃H₂₁N₃O₄S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf	
			Total	C	N	O		S
7	F	1	31	23	3	4	1	0



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1006848	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	56.15	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.113	Depositor
Minimum map value	-1.458	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.174	Depositor
Map size (\AA)	244.8, 244.8, 244.8	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.85, 0.85, 0.85	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: U2U

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	0.26	0/1947	0.50	0/2621
2	B	0.26	0/2638	0.57	1/3577 (0.0%)
3	D	0.28	0/400	0.49	0/540
4	C	0.28	0/1825	0.52	0/2474
5	F	0.26	0/2056	0.50	0/2804
6	E	0.27	0/987	0.55	1/1337 (0.1%)
All	All	0.27	0/9853	0.53	2/13353 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	333	ASP	CB-CG-OD1	5.41	123.17	118.30
6	E	107	CYS	CA-CB-SG	5.07	123.13	114.00

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	1913	0	1906	24	0
2	B	2591	0	2499	35	0
3	D	394	0	402	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	1781	0	1717	24	0
5	F	2001	0	2088	46	0
6	E	967	0	933	24	0
7	F	31	0	0	2	0
All	All	9678	0	9545	152	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 (152) 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)
4:C:94:TYR:O	4:C:114:GLY:HA3	1.60	1.01
5:F:56:MET:O	5:F:57:ARG:HG3	1.70	0.90
5:F:27:THR:HG21	5:F:30:LEU:CD1	2.02	0.89
5:F:27:THR:HG21	5:F:30:LEU:HD12	1.62	0.80
2:B:180:THR:HG1	2:B:190:TRP:HE1	1.28	0.78
5:F:226:LEU:HD22	5:F:230:LEU:HD12	1.66	0.76
5:F:226:LEU:CD2	5:F:230:LEU:CD1	2.64	0.76
5:F:226:LEU:CD2	5:F:230:LEU:HD11	2.21	0.70
3:D:46:LYS:O	3:D:46:LYS:HG2	1.94	0.68
3:D:25:ILE:HG13	3:D:27:ARG:HE	1.59	0.67
5:F:226:LEU:CD2	5:F:230:LEU:HD12	2.25	0.66
5:F:56:MET:O	5:F:57:ARG:CG	2.41	0.65
1:A:218:ASP:OD2	2:B:78:LYS:NZ	2.30	0.65
5:F:52:LEU:HD11	5:F:273:PHE:CE1	2.31	0.65
5:F:226:LEU:HD22	5:F:230:LEU:CD1	2.26	0.65
2:B:173:LEU:HD22	2:B:217:THR:HG23	1.78	0.65
6:E:98:ARG:HG2	6:E:99:CYS:H	1.61	0.64
4:C:88:SER:HA	4:C:119:VAL:HG21	1.80	0.64
2:B:292:CYS:HB2	2:B:311:ASP:HB2	1.78	0.64
5:F:52:LEU:HD21	5:F:273:PHE:HE1	1.62	0.64
5:F:52:LEU:HD23	5:F:56:MET:SD	2.38	0.63
6:E:52:SER:O	6:E:72:ARG:NH1	2.32	0.63
6:E:62:GLY:HA2	6:E:65:LYS:HE3	1.80	0.62
1:A:247:ASN:HB3	1:A:250:LEU:HB2	1.81	0.62
5:F:52:LEU:CD2	5:F:56:MET:SD	2.87	0.62
2:B:55:THR:HG21	2:B:321:LEU:HB3	1.80	0.62
5:F:226:LEU:HD23	5:F:230:LEU:HD11	1.81	0.62
2:B:238:MET:SD	2:B:240:ARG:NH2	2.73	0.62
4:C:40:ALA:HB3	4:C:43:LYS:HB2	1.80	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:E:91:THR:HG23	6:E:91:THR:O	2.00	0.61
6:E:91:THR:OG1	6:E:125:THR:HA	2.01	0.61
5:F:27:THR:CG2	5:F:30:LEU:HD12	2.31	0.60
6:E:100:PRO:HD2	6:E:107:CYS:HB2	1.82	0.60
2:B:82:MET:HG2	2:B:338:CYS:HB2	1.81	0.60
4:C:94:TYR:O	4:C:114:GLY:CA	2.43	0.59
5:F:226:LEU:HD23	5:F:230:LEU:CD1	2.31	0.59
2:B:186:THR:HG22	2:B:202:THR:HG22	1.84	0.58
5:F:55:ARG:O	5:F:56:MET:HG3	2.02	0.58
2:B:181:SER:HB2	2:B:211:LEU:HD23	1.85	0.57
4:C:4:LEU:HD12	4:C:110:PHE:HD2	1.69	0.57
4:C:181:ARG:NH1	4:C:187:GLN:OE1	2.36	0.57
1:A:201:ASP:N	1:A:201:ASP:OD1	2.37	0.57
4:C:91:THR:HG23	4:C:118:THR:HA	1.85	0.57
5:F:27:THR:CG2	5:F:30:LEU:HG	2.34	0.56
6:E:47:TRP:HZ2	6:E:50:ASP:HB2	1.71	0.56
2:B:151:GLU:HA	4:C:27:PHE:HB2	1.87	0.56
5:F:119:GLU:OE2	5:F:134:ARG:NH2	2.39	0.56
2:B:230:LYS:NZ	2:B:242:THR:OG1	2.39	0.55
4:C:100:ILE:HD13	4:C:102:TYR:HE2	1.71	0.55
5:F:52:LEU:HD11	5:F:273:PHE:CD1	2.42	0.55
1:A:186:PHE:HE2	1:A:203:GLY:HA3	1.72	0.55
6:E:39:GLN:HB2	6:E:45:LEU:HD13	1.90	0.54
1:A:53:GLN:OE1	1:A:339:ASN:ND2	2.34	0.54
5:F:247:GLU:HB3	5:F:250:PHE:HB2	1.90	0.54
1:A:187:GLU:HG3	1:A:200:PHE:CE1	2.43	0.54
4:C:179:LEU:HB2	4:C:189:LEU:HD11	1.89	0.53
4:C:224:ASP:OD2	4:C:228:TYR:OH	2.26	0.53
5:F:270:ILE:HG13	5:F:274:PHE:HD2	1.72	0.53
6:E:36:TRP:HD1	6:E:70:ILE:HD12	1.74	0.53
6:E:85:SER:O	6:E:85:SER:OG	2.27	0.53
1:A:42:ALA:O	1:A:45:SER:OG	2.28	0.52
2:B:133:VAL:HG12	2:B:145:TYR:HB2	1.91	0.52
6:E:50:ASP:OD1	6:E:51:ILE:N	2.43	0.52
6:E:69:THR:HG23	6:E:82:GLN:HB3	1.91	0.52
1:A:282:GLU:OE2	1:A:285:ARG:NH2	2.43	0.51
2:B:116:LEU:HD13	2:B:121:VAL:HG11	1.92	0.51
4:C:175:LEU:HB3	4:C:193:MET:HB2	1.92	0.51
4:C:98:ARG:HD3	4:C:110:PHE:HB3	1.92	0.51
5:F:79:ARG:HA	5:F:102:MET:HE1	1.93	0.51
1:A:251:ARG:HG2	1:A:251:ARG:O	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:55:THR:HG22	2:B:55:THR:O	2.11	0.51
2:B:82:MET:CE	2:B:349:ALA:HB3	2.42	0.50
2:B:184:ASP:OD1	2:B:186:THR:OG1	2.28	0.50
1:A:247:ASN:HA	6:E:106:ASP:OD2	2.11	0.50
4:C:193:MET:O	4:C:193:MET:HG2	2.12	0.50
2:B:217:THR:O	2:B:217:THR:HG22	2.13	0.49
3:D:48:ASP:OD1	3:D:48:ASP:N	2.36	0.49
2:B:297:VAL:HG13	2:B:306:LEU:HD11	1.95	0.49
2:B:354:ASP:OD1	2:B:354:ASP:N	2.44	0.48
5:F:106:TYR:OH	5:F:229:GLY:O	2.30	0.48
1:A:231:TYR:HA	1:A:234:LEU:HG	1.95	0.48
2:B:341:VAL:HG22	2:B:348:VAL:HG22	1.96	0.48
5:F:27:THR:CG2	5:F:30:LEU:CD1	2.83	0.48
4:C:53:SER:HA	4:C:72:ARG:NH1	2.29	0.47
2:B:270:THR:HG22	2:B:286:SER:HB3	1.96	0.47
5:F:55:ARG:HG3	5:F:56:MET:H	1.78	0.47
2:B:72:LEU:HB2	2:B:357:LEU:HB2	1.95	0.47
4:C:74:ASP:N	4:C:74:ASP:OD1	2.49	0.46
1:A:263:ASP:N	1:A:263:ASP:OD1	2.47	0.46
1:A:291:ASP:OD1	1:A:291:ASP:N	2.46	0.46
1:A:251:ARG:HD2	1:A:324:ARG:NH1	2.31	0.46
1:A:186:PHE:CE2	1:A:203:GLY:HA3	2.51	0.46
5:F:99:TYR:OH	5:F:157:GLU:OE2	2.24	0.46
2:B:93:SER:OG	2:B:357:LEU:HD11	2.16	0.45
5:F:232:PHE:HA	5:F:257:SER:HB2	1.99	0.45
1:A:209:ARG:HH21	6:E:108:PHE:HE1	1.64	0.45
4:C:36:TRP:HE1	4:C:79:LEU:HD23	1.82	0.45
5:F:38:SER:HA	5:F:76:LEU:HD22	1.97	0.45
5:F:79:ARG:N	5:F:102:MET:HE2	2.32	0.44
5:F:157:GLU:OE1	7:F:501:U2U:N3	2.50	0.44
5:F:270:ILE:O	5:F:274:PHE:HB2	2.18	0.44
4:C:32:PHE:CD1	4:C:100:ILE:HB	2.51	0.44
4:C:50:TYR:HD2	4:C:59:TYR:HD2	1.64	0.44
1:A:251:ARG:HD2	1:A:324:ARG:HH12	1.83	0.44
5:F:56:MET:SD	5:F:57:ARG:HG3	2.58	0.44
5:F:228:CYS:HB3	5:F:264:ASN:HB2	1.99	0.44
6:E:37:VAL:HG11	6:E:111:THR:HG22	2.00	0.44
1:A:324:ARG:HE	1:A:324:ARG:HB2	1.59	0.44
5:F:228:CYS:CB	5:F:264:ASN:HB2	2.48	0.44
6:E:109:ASP:HB2	6:E:112:SER:OG	2.18	0.44
5:F:255:LEU:HD22	5:F:255:LEU:H	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:LEU:HB3	1:A:329:PRO:HA	2.00	0.44
5:F:27:THR:HG21	5:F:30:LEU:CG	2.48	0.44
2:B:240:ARG:HG3	2:B:240:ARG:HH11	1.82	0.43
5:F:79:ARG:HA	5:F:102:MET:CE	2.48	0.43
5:F:28:LEU:O	5:F:32:VAL:HG23	2.18	0.43
6:E:91:THR:O	6:E:91:THR:CG2	2.66	0.43
2:B:311:ASP:OD1	2:B:335:ARG:NE	2.52	0.43
4:C:64:VAL:HG12	4:C:67:ARG:NH2	2.34	0.43
5:F:27:THR:CG2	5:F:30:LEU:CG	2.97	0.43
6:E:61:THR:HG22	6:E:64:VAL:HG22	2.00	0.43
2:B:82:MET:HE1	2:B:349:ALA:HB3	2.00	0.43
2:B:138:LEU:HD12	2:B:166:TYR:HB3	2.00	0.43
5:F:27:THR:HG22	5:F:30:LEU:HG	2.00	0.43
5:F:188:CYS:HB2	5:F:230:LEU:HD21	2.01	0.43
5:F:242:ILE:HG22	5:F:244:VAL:HG22	2.01	0.43
2:B:96:GLN:HE21	2:B:120:TRP:HE3	1.65	0.42
4:C:53:SER:HA	4:C:72:ARG:HH12	1.84	0.42
5:F:156:LEU:HD13	5:F:160:LEU:HB3	2.01	0.42
1:A:268:LYS:O	1:A:274:SER:OG	2.37	0.42
2:B:300:SER:HB2	2:B:305:LEU:HB2	2.00	0.42
4:C:244:THR:O	4:C:244:THR:OG1	2.36	0.42
5:F:141:VAL:O	5:F:144:VAL:HG22	2.20	0.42
6:E:86:LEU:HB3	6:E:126:VAL:HG11	2.00	0.42
2:B:248:SER:OG	2:B:249:ASP:N	2.52	0.42
4:C:19:LYS:HG3	4:C:82:GLN:HG2	2.01	0.42
6:E:47:TRP:CZ2	6:E:50:ASP:HB2	2.54	0.42
6:E:115:TYR:HD2	6:E:118:ARG:HB2	1.85	0.42
1:A:294:PRO:HD2	1:A:307:TYR:OH	2.20	0.42
2:B:78:LYS:HB2	2:B:353:TRP:CD1	2.55	0.41
2:B:240:ARG:HG3	2:B:240:ARG:NH1	2.35	0.41
5:F:96:LYS:HD3	7:F:501:U2U:O2	2.20	0.41
1:A:247:ASN:HD22	1:A:250:LEU:HD22	1.85	0.41
2:B:171:ARG:HD3	2:B:171:ARG:HA	1.93	0.41
2:B:173:LEU:HD23	2:B:213:LEU:HD21	2.02	0.41
1:A:254:SER:HB2	1:A:326:ILE:O	2.19	0.41
6:E:100:PRO:HD2	6:E:107:CYS:SG	2.60	0.41
6:E:102:PRO:O	6:E:104:THR:HG23	2.20	0.41
2:B:301:LYS:HB3	3:D:48:ASP:HB3	2.03	0.41
4:C:74:ASP:HB2	4:C:75:PRO:HD3	2.03	0.40
1:A:302:VAL:O	1:A:306:LYS:HG3	2.22	0.40
6:E:65:LYS:HE3	6:E:65:LYS:HB2	1.90	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	229/362 (63%)	216 (94%)	13 (6%)	0	100	100
2	B	335/384 (87%)	320 (96%)	15 (4%)	0	100	100
3	D	49/71 (69%)	48 (98%)	1 (2%)	0	100	100
4	C	228/259 (88%)	220 (96%)	8 (4%)	0	100	100
5	F	248/637 (39%)	228 (92%)	20 (8%)	0	100	100
6	E	125/157 (80%)	117 (94%)	8 (6%)	0	100	100
All	All	1214/1870 (65%)	1149 (95%)	65 (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	211/317 (67%)	209 (99%)	2 (1%)	78	92
2	B	280/315 (89%)	272 (97%)	8 (3%)	42	76
3	D	42/58 (72%)	41 (98%)	1 (2%)	49	79
4	C	196/209 (94%)	192 (98%)	4 (2%)	55	83
5	F	226/557 (41%)	222 (98%)	4 (2%)	59	85
6	E	105/127 (83%)	100 (95%)	5 (5%)	25	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1060/1583 (67%)	1036 (98%)	24 (2%)	53 80

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	LYS
1	A	231	TYR
2	B	63	ARG
2	B	65	GLN
2	B	80	TYR
2	B	126	TYR
2	B	235	ARG
2	B	255	PHE
2	B	288	ASP
2	B	361	ASN
3	D	59	ASN
4	C	11	LEU
4	C	74	ASP
4	C	161	ARG
4	C	187	GLN
5	F	55	ARG
5	F	133	HIS
5	F	163	PHE
5	F	266	SER
6	E	31	ASN
6	E	71	SER
6	E	83	MET
6	E	85	SER
6	E	117	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
3	D	59	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	U2U	F	501	-	34,34,34	1.85	8 (23%)	49,49,49	2.41	11 (22%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	U2U	F	501	-	-	8/17/17/17	0/4/4/4

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	F	501	U2U	C22-C17	-6.33	1.39	1.45
7	F	501	U2U	S1-N1	4.12	1.70	1.63
7	F	501	U2U	C22-N3	3.00	1.45	1.34
7	F	501	U2U	C17-C18	-2.79	1.37	1.43
7	F	501	U2U	O3-S1	2.56	1.46	1.43
7	F	501	U2U	O2-S1	2.45	1.46	1.43
7	F	501	U2U	C7-S1	2.37	1.81	1.77
7	F	501	U2U	C20-C18	-2.06	1.37	1.41

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	F	501	U2U	O3-S1-O2	-13.44	103.02	119.55
7	F	501	U2U	O1-C2-C7	3.79	119.44	116.50
7	F	501	U2U	C1-O1-C2	-3.12	112.82	117.53
7	F	501	U2U	C7-S1-N1	2.87	110.62	107.27
7	F	501	U2U	C13-O4-C14	-2.53	111.69	118.00
7	F	501	U2U	C17-C22-N3	-2.42	117.79	121.54
7	F	501	U2U	O3-S1-N1	2.42	112.79	106.73
7	F	501	U2U	O1-C2-C3	-2.42	120.22	124.37
7	F	501	U2U	C20-C18-C19	-2.17	118.18	122.02
7	F	501	U2U	O3-S1-C7	2.15	111.20	107.66
7	F	501	U2U	C6-C7-S1	2.07	120.22	117.42

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	F	501	U2U	C2-C7-S1-O2
7	F	501	U2U	C3-C2-O1-C1
7	F	501	U2U	C7-C2-O1-C1
7	F	501	U2U	C8-N1-S1-O2
7	F	501	U2U	C6-C7-S1-O2
7	F	501	U2U	C2-C7-S1-N1
7	F	501	U2U	C6-C7-S1-N1
7	F	501	U2U	C8-N1-S1-C7

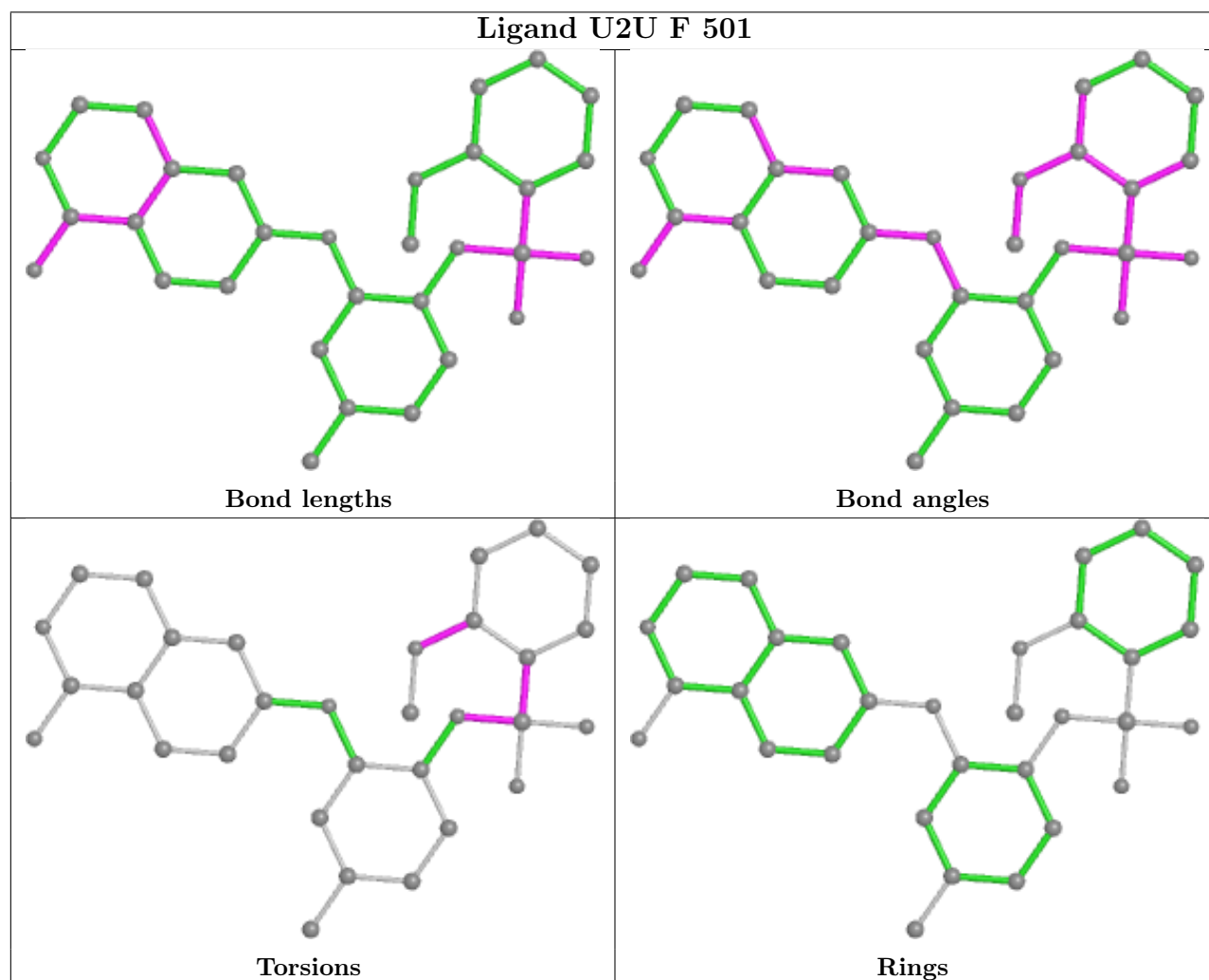
There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	F	501	U2U	2	0

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

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



5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

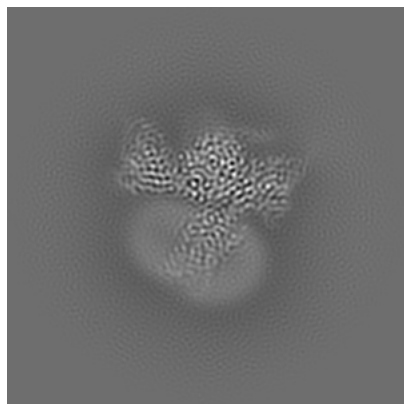
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-34833. These allow visual inspection of the internal detail of the map and identification of artifacts.

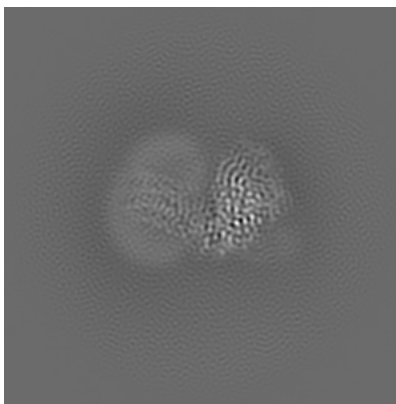
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

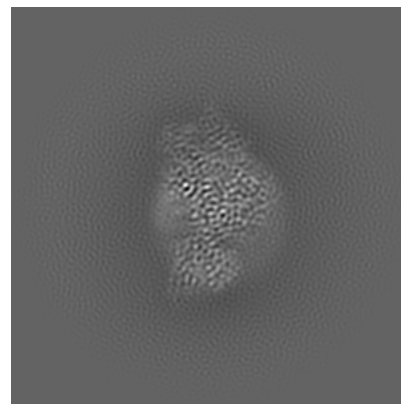
6.1.1 Primary map



X

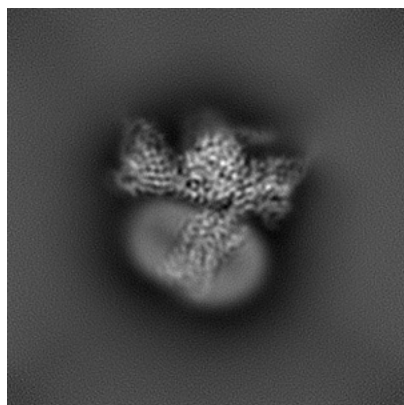


Y

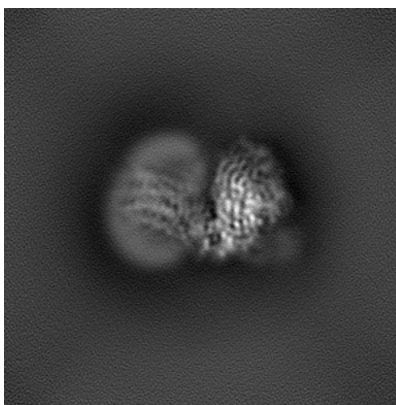


Z

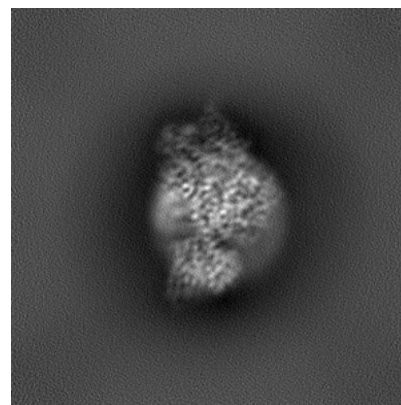
6.1.2 Raw map



X



Y

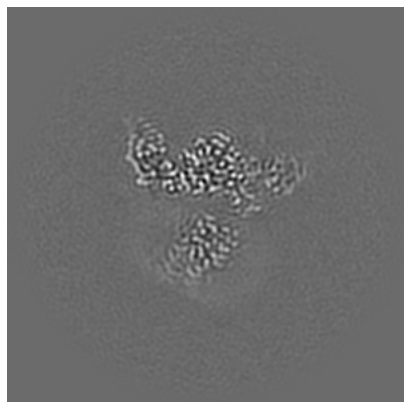


Z

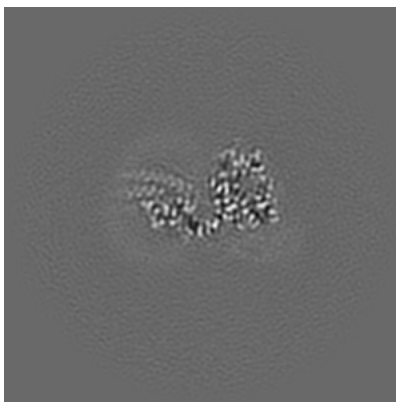
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

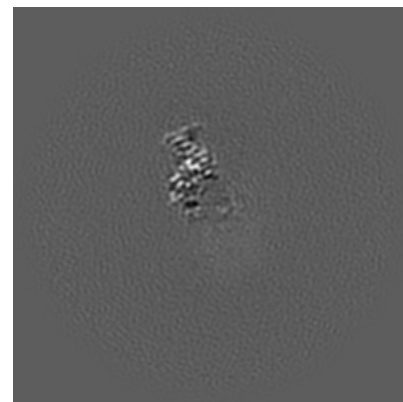
6.2.1 Primary map



X Index: 144

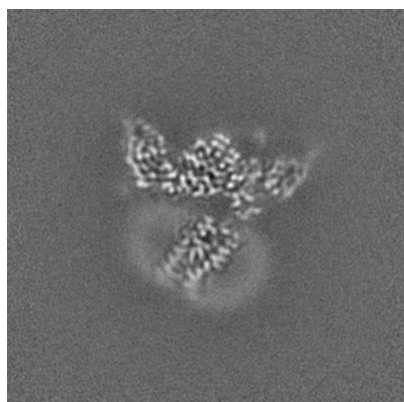


Y Index: 144

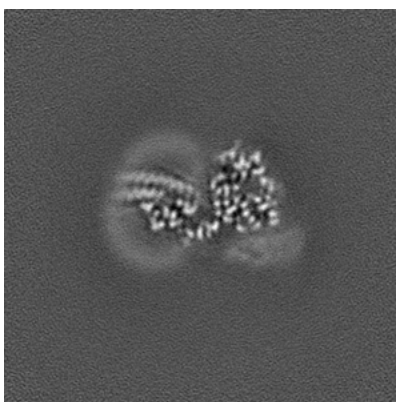


Z Index: 144

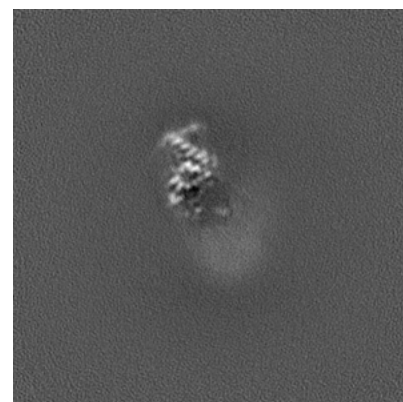
6.2.2 Raw map



X Index: 144



Y Index: 144

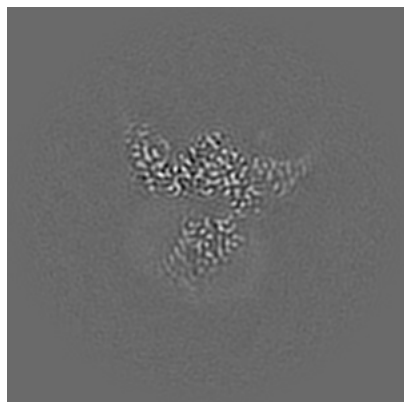


Z Index: 144

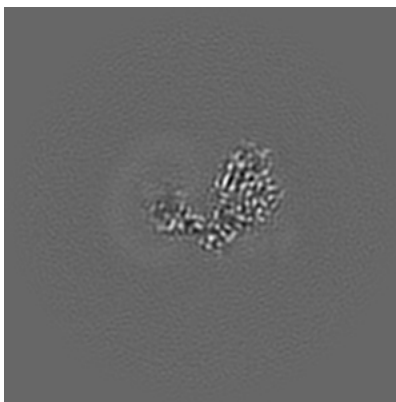
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

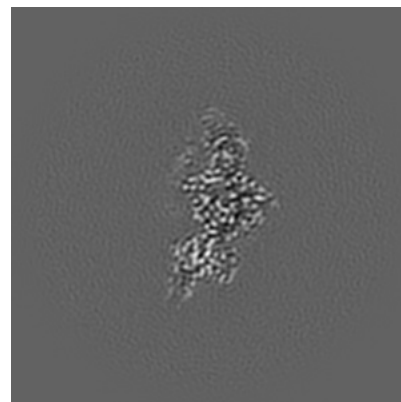
6.3.1 Primary map



X Index: 141

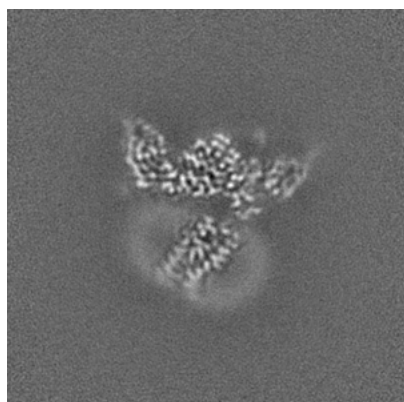


Y Index: 156

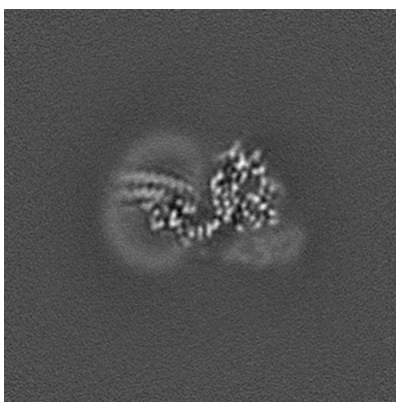


Z Index: 167

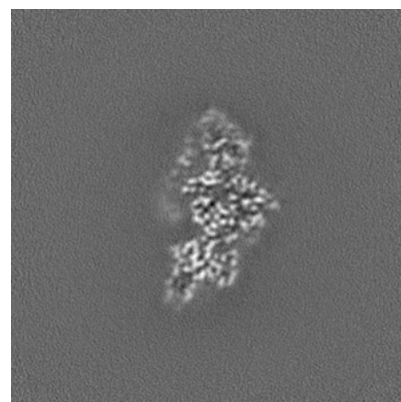
6.3.2 Raw map



X Index: 144



Y Index: 145

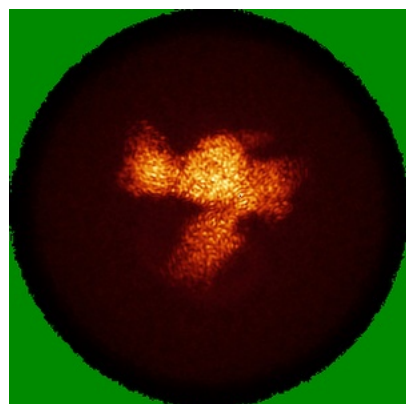


Z Index: 167

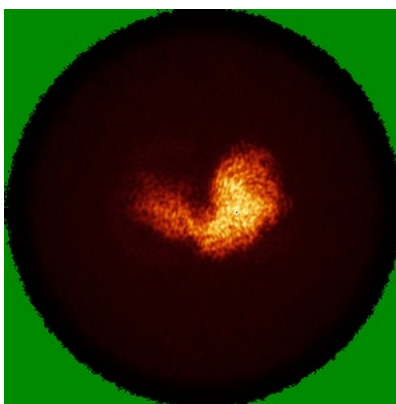
The images above show the largest variance slices of the map in three orthogonal directions.

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

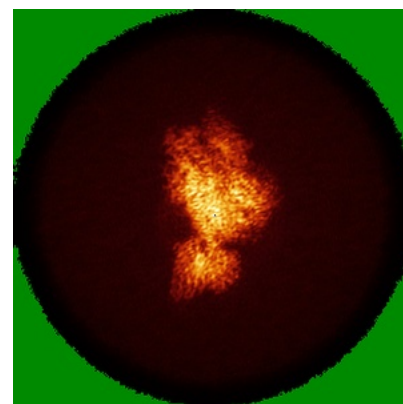
6.4.1 Primary map



X

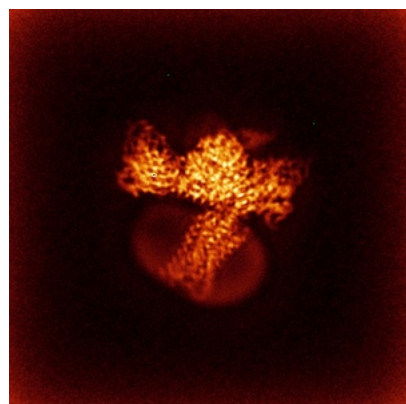


Y

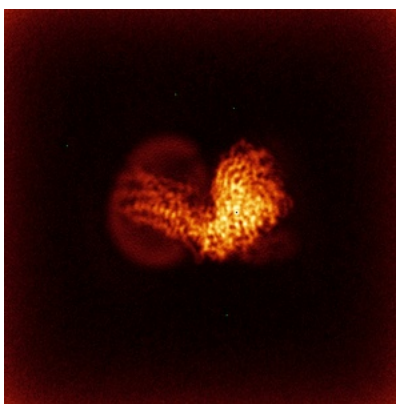


Z

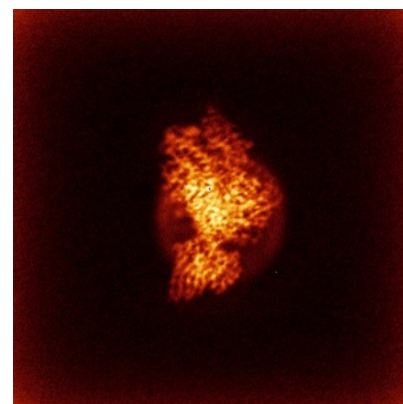
6.4.2 Raw map



X



Y

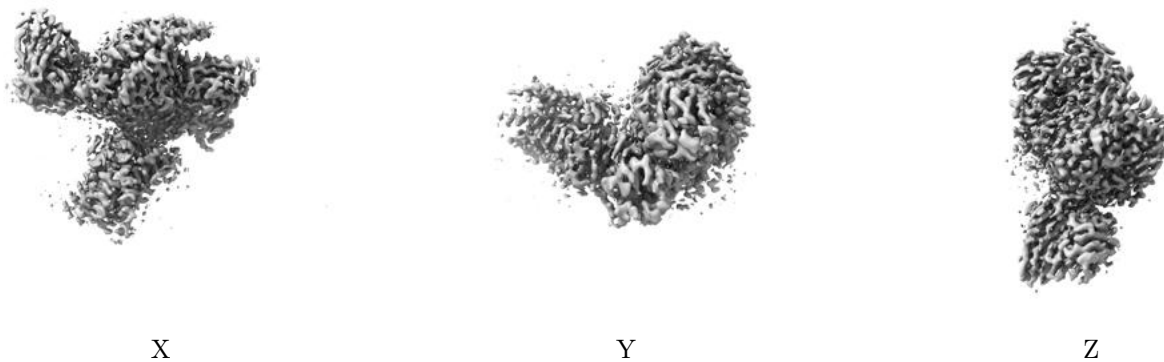


Z

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.

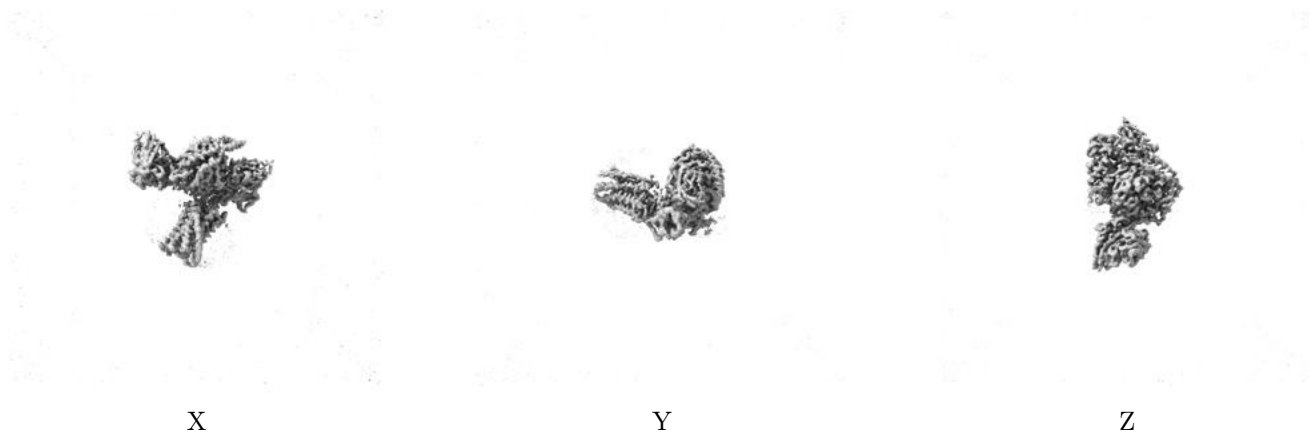
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.174. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

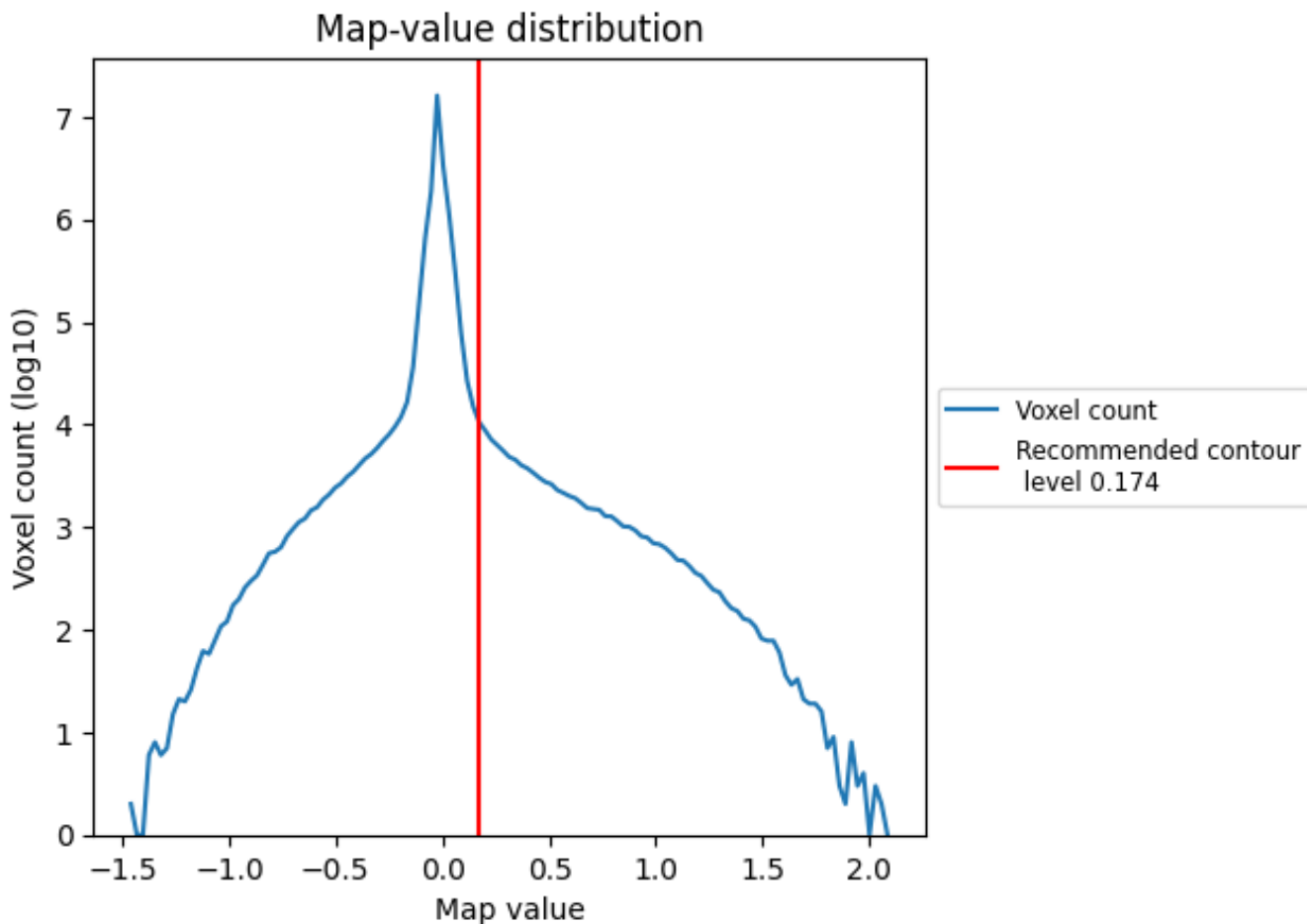
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

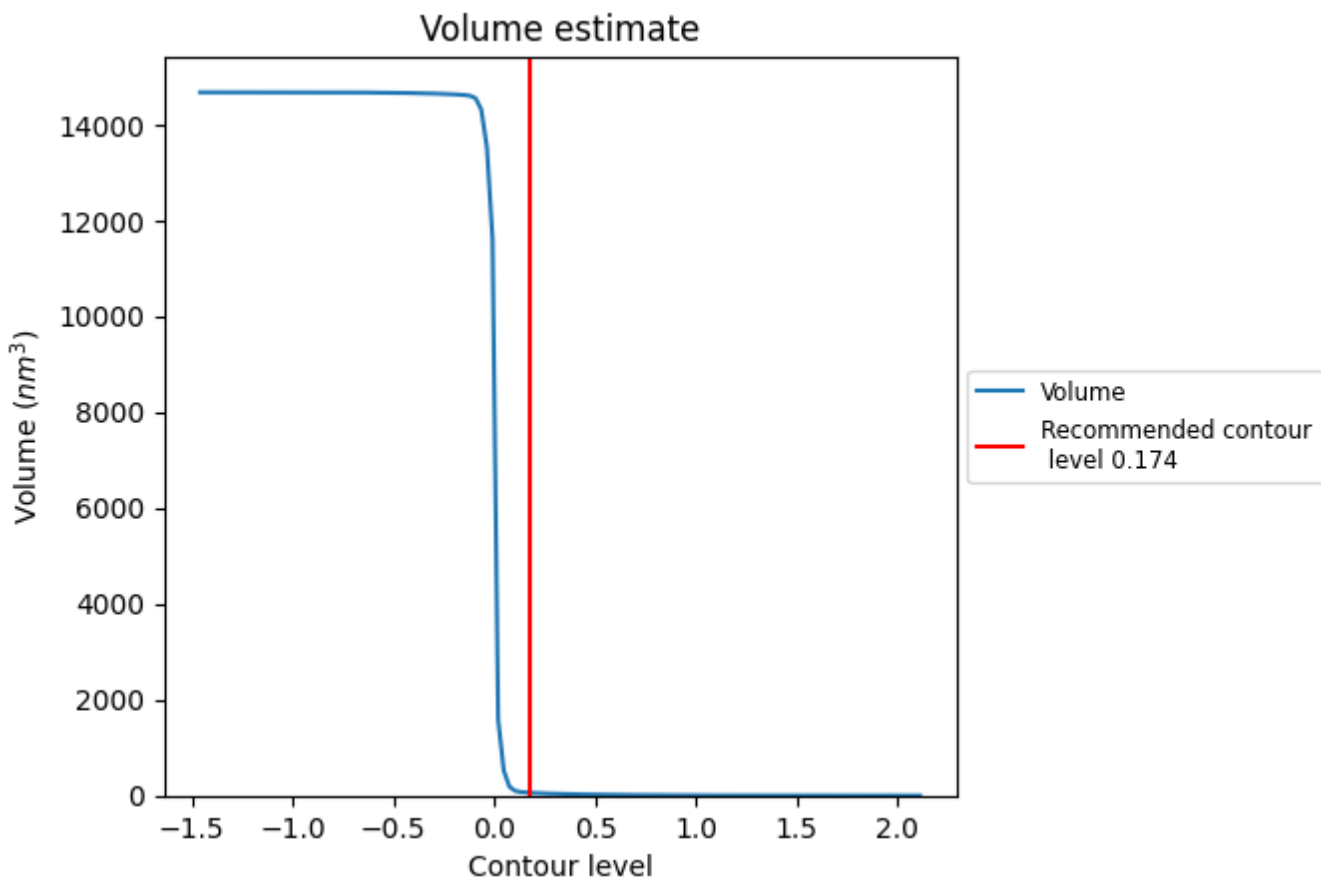
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

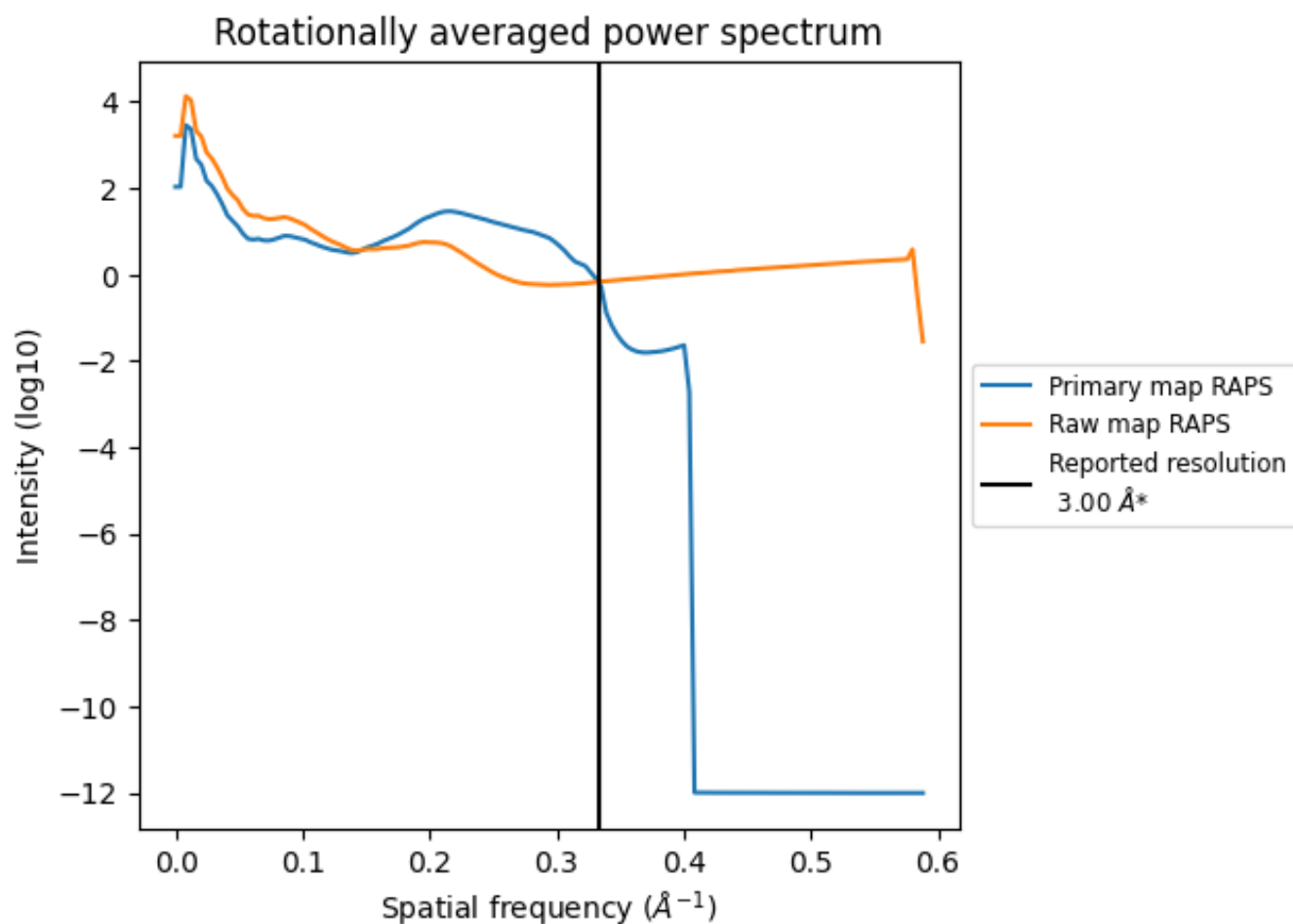
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 59 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 [i](#)

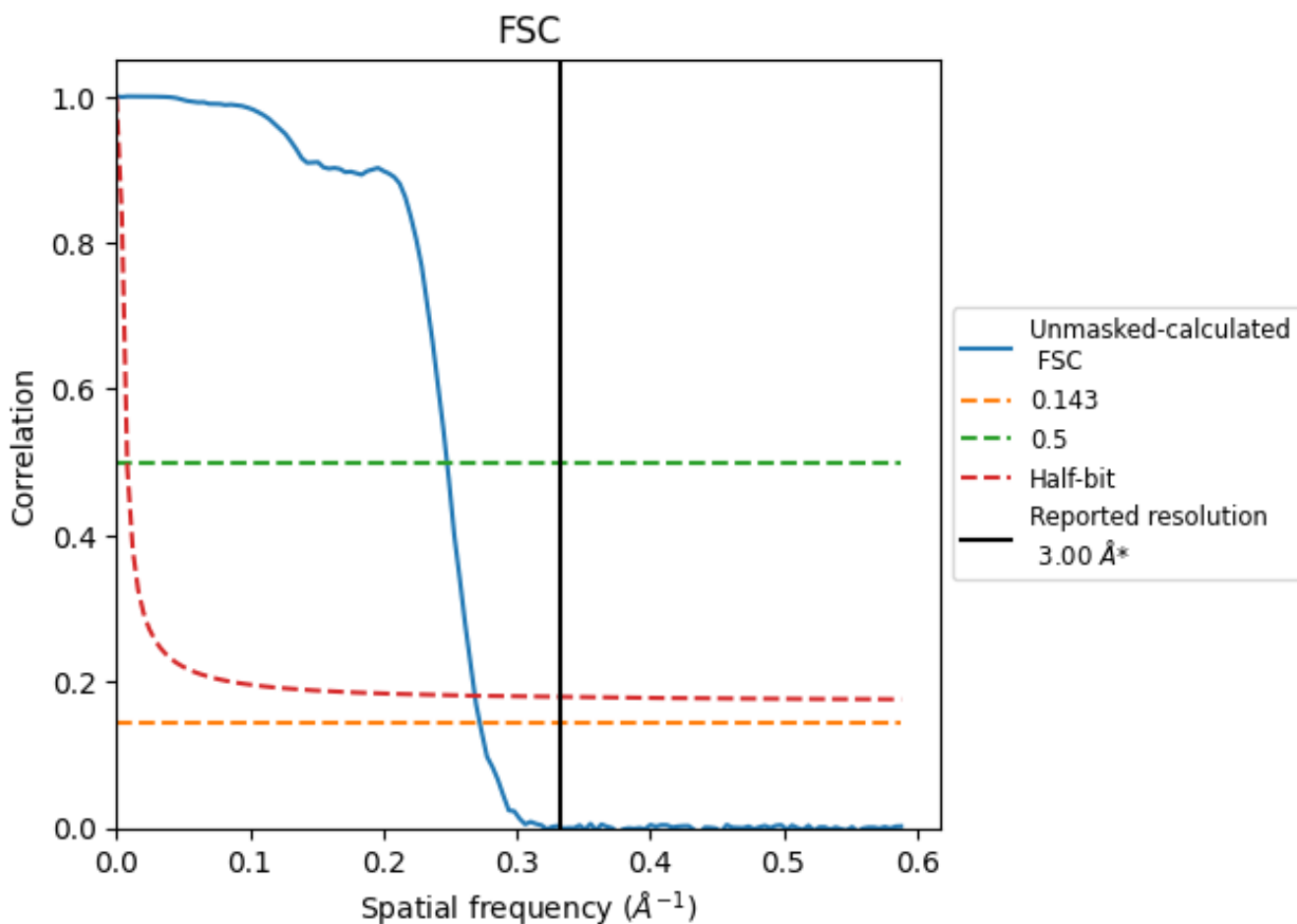


*Reported resolution corresponds to spatial frequency of 0.333 \AA^{-1}

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 0.333 Å⁻¹

8.2 Resolution estimates [i](#)

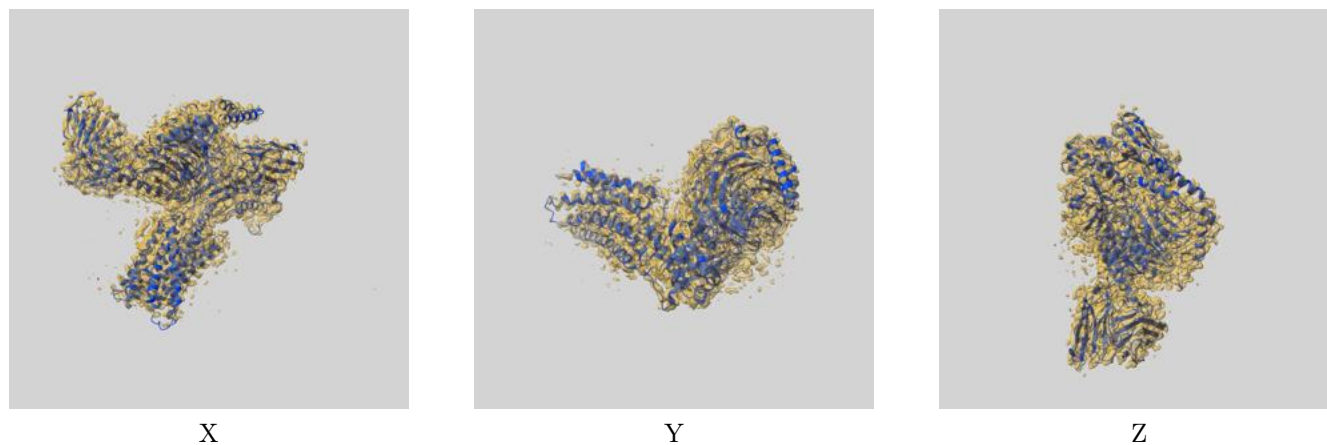
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.67	4.04	3.72

*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 3.67 differs from the reported value 3.0 by more than 10 %

9 Map-model fit [i](#)

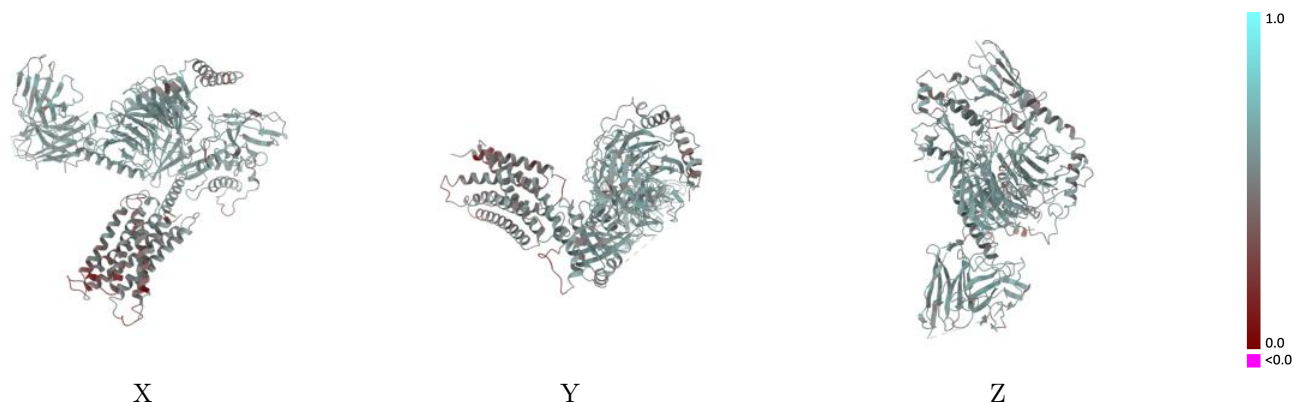
This section contains information regarding the fit between EMDB map EMD-34833 and PDB model 8HJ5. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



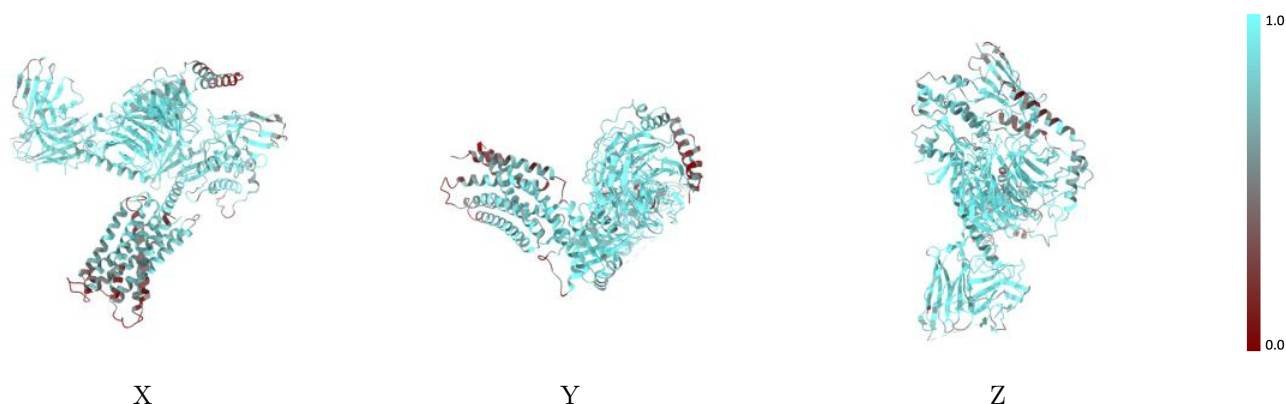
The images above show the 3D surface view of the map at the recommended contour level 0.174 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



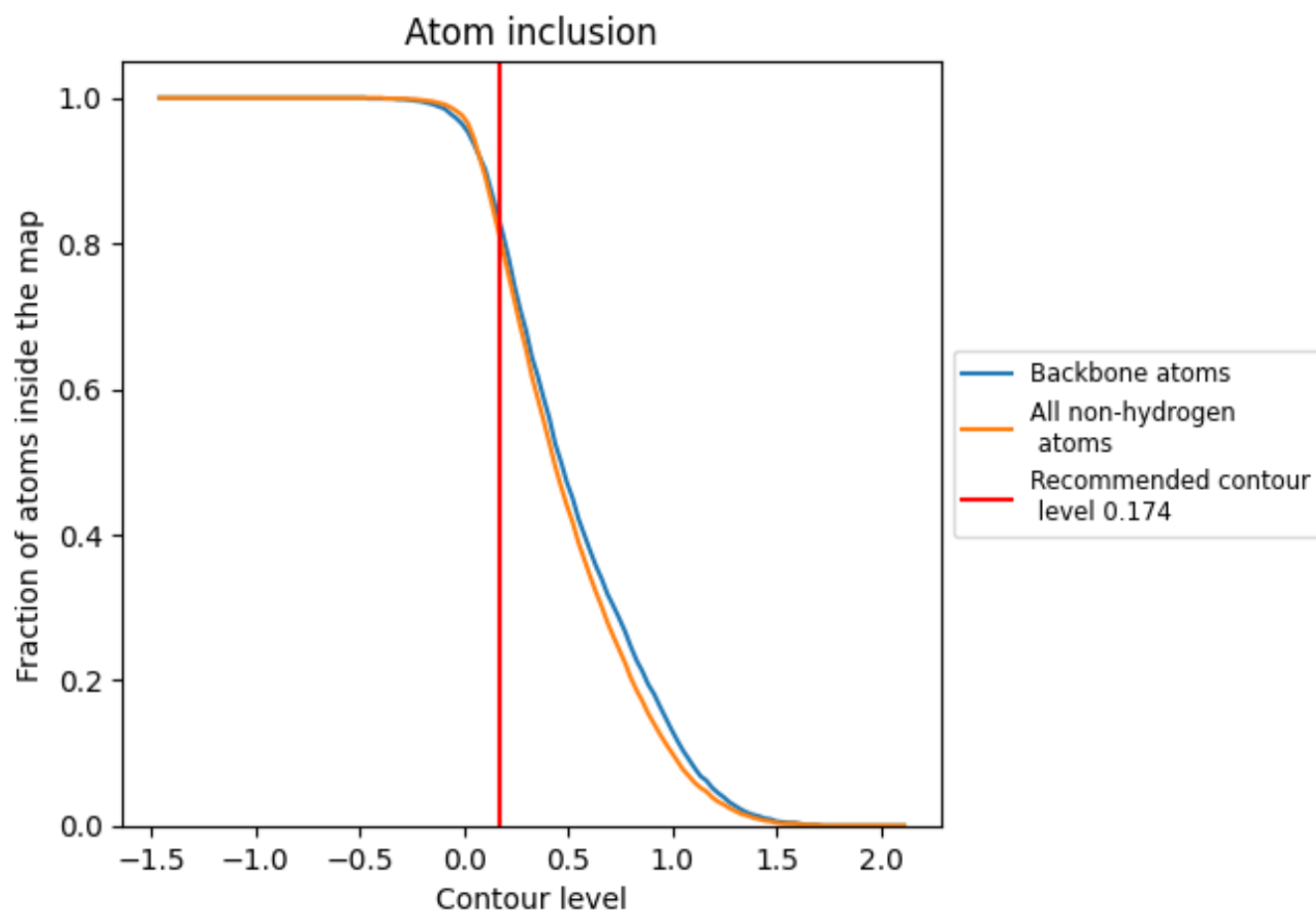
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.174).















9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 81% 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 (0.174) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8070	 0.5340
A	 0.8550	 0.5520
B	 0.8890	 0.5700
C	 0.8580	 0.5580
D	 0.6940	 0.5180
E	 0.7970	 0.5380
F	 0.6410	 0.4490

