Full wwPDB EM Validation Report ⓘ

Mar 10, 2025 – 10:03 PM JST

PDB ID	:	9L0D
EMDB ID	:	EMD-62697
Title	:	Cryo-EM structure of the human MON1A/CCZ1/C18orf8 complex
Authors	:	Tang, Y.; Han, Y.; Zhang, Y.; Pan, L.
Deposited on	:	2024-12-12
Resolution	:	3.41 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:

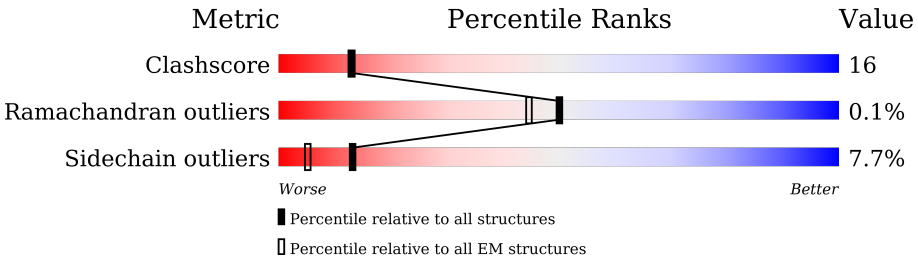
EMDB validation analysis	:	0.0.1.dev117
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41.2

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 3.41 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 <=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	418	26% 49% 45% 6%
2	B	482	15% 67% 27%
3	C	657	31% 64% 33%
4	D	207	66% 51% 31% 14%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 13894 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 Vacuolar fusion protein MON1 homolog A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	417	3349	2136	593	609	11	0	0

- Molecule 2 is a protein called Vacuolar fusion protein CCZ1 homolog B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	466	3837	2465	642	707	23	0	0

- Molecule 3 is a protein called Regulator of MON1-CCZ1 complex.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	657	5280	3391	900	960	29	0	0

- Molecule 4 is a protein called Ras-related protein Rab-7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	178	1428	908	241	273	6	0	0

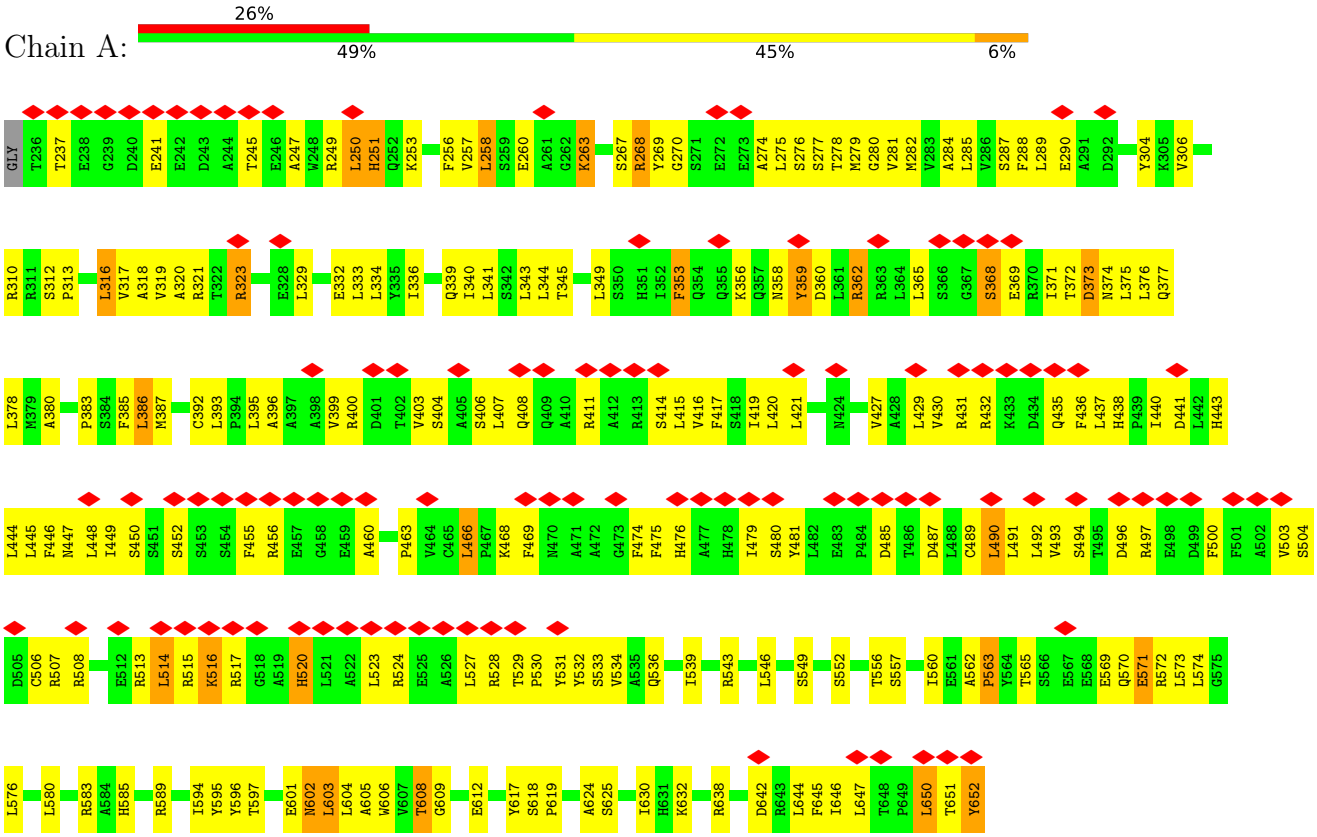
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	22	ASN	THR	conflict	UNP P51149

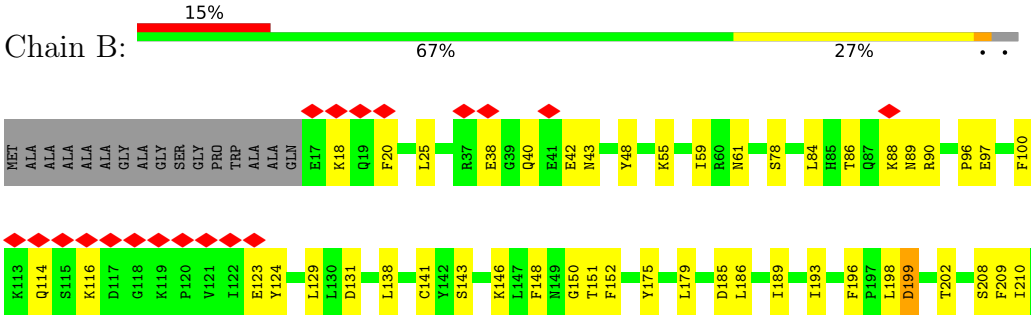
3 Residue-property plots (i)

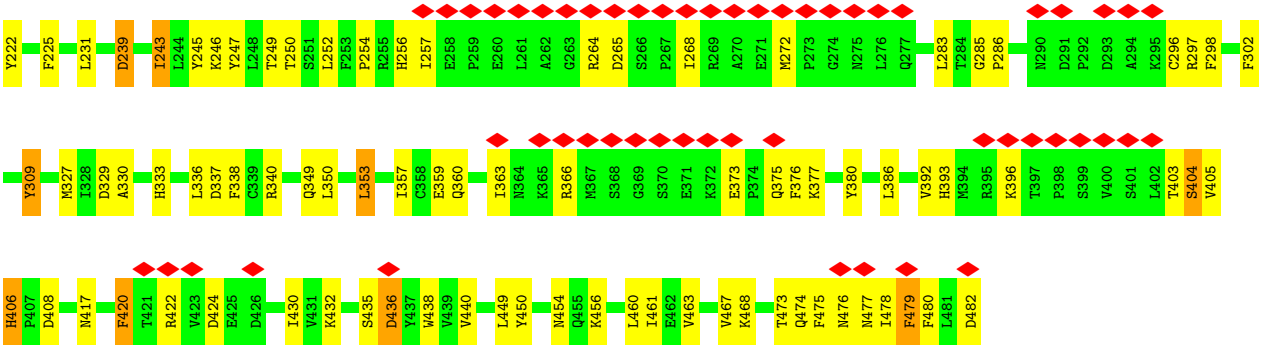
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Vacuolar fusion protein MON1 homolog A



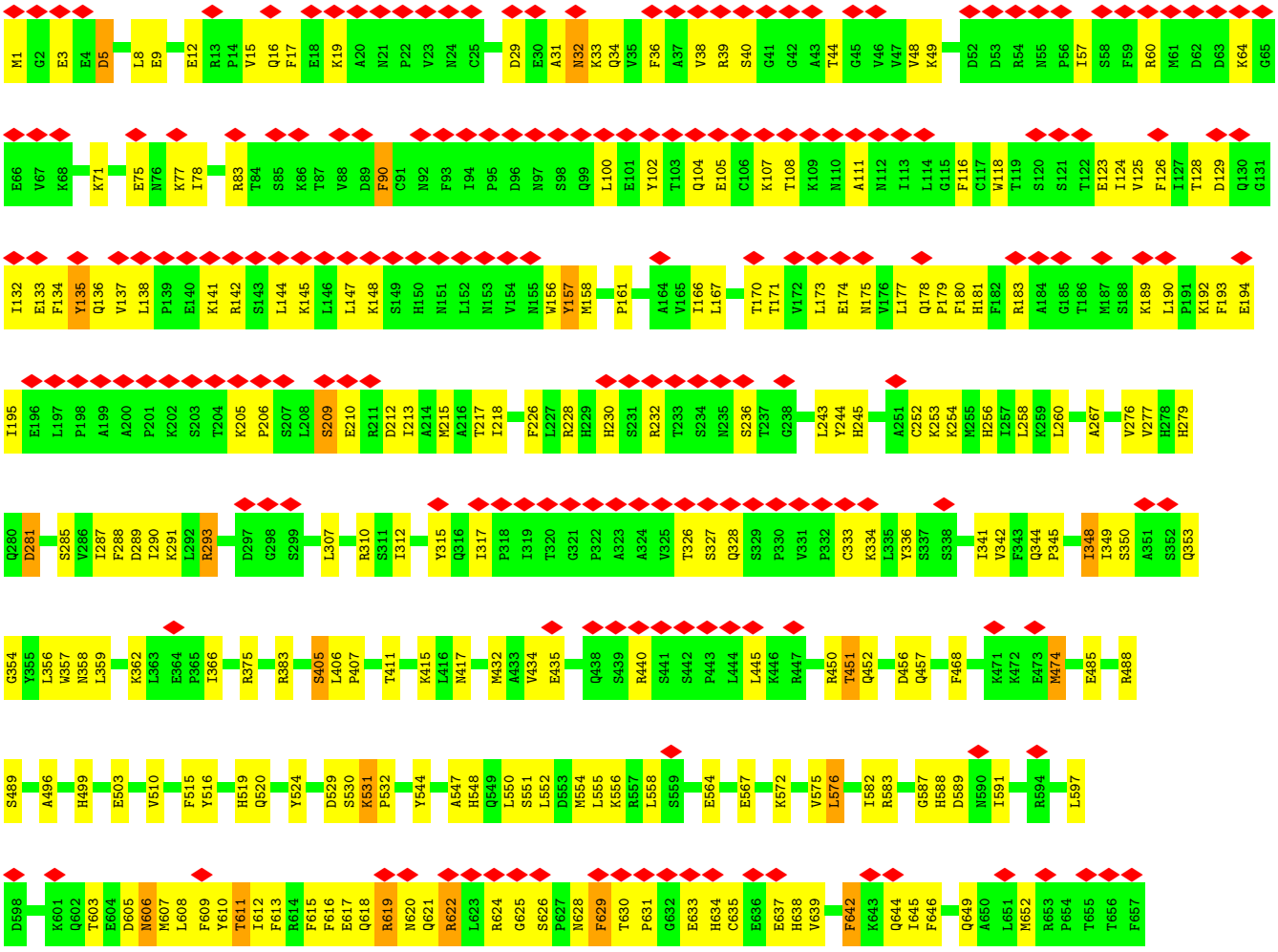
• Molecule 2: Vacuolar fusion protein CCZ1 homolog B





• Molecule 3: Regulator of MON1-CCZ1 complex

Chain C:



• Molecule 4: Ras-related protein Rab-7a

Chain D:


MET THR SER ARG LYS LYS VAL L8 L9 K10 V11 G15 D16 S17 G18 V19 G20 K21 N22 S23 L24 M25 N26 Q27 Y28 V29 N30 K31 K32 F33 S34 N35 Q36 Y37 K38 A39 T40 I41 G42 A43 D44 F45 L46 T47 K48 E49 V50 M51 V52 D53 D54 R55 L56 V57 T58 M59 Q60 I61 W62
D63 T64 A65 G66 Q67 E68 R69 F70 Q71 G74 Y78 R79 C80 A81 D82 C83 C84 V85 L86 V87 F88 D89 V90 T91 A92 P93 N94 T95 F96 K97 T98 L99 D100 S101 W102 R103 D104 E105 F106 L107 I108 Q109 A110 S111 P112 R113 D114 P115 E116 N117 F118 P119 F120 V121 V122 L123 G124 N125
K126 I127 D128 L129 E130 N131 R132 Q133 V134 A135 T136 K137 R138 A139 Q140 A141 W142 C143 Y144 S145 K146 N147 N148 I149 P150 Y151 F152 E153 T154 S155 A156 K157 E158 A159 I160 N161 V162 E163 Q164 A165 F166 Q167 T168 I169 A170 R171 N172 A173 L174 K175 Q176 E177 T178 E179 V180 E181 L182 Y183 N184 E185
PHE PRO GLU PRO ILE LYS LEU ASP LYS ASN ASP ARG ALA LYS ALA SER ALA GLU SER CYS SER CYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	77193	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI SPIRIT	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	49.4	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.503	Depositor
Minimum map value	-3.204	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.071	Depositor
Recommended contour level	0.459	Depositor
Map size (Å)	316.49997, 316.49997, 316.49997	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.055, 1.055, 1.055	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	0.32	0/3423	0.49	0/4636
2	B	0.36	0/3927	0.47	0/5298
3	C	0.29	0/5404	0.47	0/7319
4	D	0.31	0/1455	0.50	1/1970 (0.1%)
All	All	0.32	0/14209	0.48	1/19223 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
3	C	0	2
All	All	0	4

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	24	LEU	CA-CB-CG	5.70	128.41	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	275	LEU	Peptide
1	A	277	SER	Peptide
3	C	611	THR	Peptide
3	C	649	GLN	Peptide

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	3349	0	3361	143	0
2	B	3837	0	3809	89	0
3	C	5280	0	5310	177	0
4	D	1428	0	1405	52	0
All	All	13894	0	13885	449	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 16.

All (449) 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:339:GLN:HE22	1:A:371:ILE:HG22	1.43	0.83
4:D:34:SER:HB3	4:D:46:LEU:HB3	1.62	0.81
1:A:455:PHE:HD1	1:A:479:ILE:HG12	1.45	0.81
3:C:519:HIS:HD1	3:C:544:TYR:HH	1.25	0.80
3:C:612:ILE:O	3:C:616:PHE:N	2.13	0.80
3:C:607:MET:O	3:C:611:THR:OG1	2.00	0.79
3:C:167:LEU:HD11	3:C:177:LEU:HB3	1.65	0.79
1:A:374:ASN:OD1	1:A:447:ASN:ND2	2.18	0.76
3:C:334:LYS:H	3:C:353:GLN:HE22	1.33	0.76
4:D:166:PHE:HA	4:D:169:ILE:HD12	1.68	0.75
2:B:186:LEU:HD12	2:B:189:ILE:HD12	1.68	0.74
2:B:212:ARG:NH1	2:B:349:GLN:OE1	2.20	0.74
2:B:468:LYS:HE2	2:B:482:ASP:HB3	1.71	0.73
1:A:597:THR:HA	1:A:602:ASN:HB2	1.69	0.72
2:B:286:PRO:HD3	2:B:296:CYS:HA	1.71	0.72
3:C:289:ASP:OD2	3:C:383:ARG:NH2	2.23	0.71
3:C:276:VAL:HG22	3:C:287:ILE:HG22	1.72	0.71
1:A:318:ALA:HB2	1:A:333:LEU:HD21	1.71	0.71
2:B:435:SER:O	2:B:456:LYS:NZ	2.24	0.71
2:B:202:THR:OG1	2:B:360:GLN:OE1	2.09	0.70
2:B:475:PHE:HB3	2:B:478:ILE:HB	1.73	0.70
1:A:562:ALA:HB3	1:A:563:PRO:HD3	1.72	0.70
3:C:605:ASP:O	3:C:608:LEU:N	2.21	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:20:PHE:HB2	2:B:110:ILE:HB	1.74	0.70
3:C:617:GLU:O	3:C:622:ARG:NH2	2.24	0.70
2:B:38:GLU:OE1	4:D:67:GLN:NE2	2.24	0.70
2:B:18:LYS:HB3	2:B:112:GLU:HB3	1.72	0.69
1:A:580:LEU:HD11	1:A:603:LEU:HD13	1.74	0.69
1:A:416:VAL:HG13	1:A:493:VAL:HG23	1.73	0.69
1:A:608:THR:OG1	1:A:609:GLY:N	2.23	0.69
3:C:17:PHE:HB3	3:C:49:LYS:HD2	1.75	0.69
4:D:17:SER:HA	4:D:21:LYS:HG3	1.74	0.69
4:D:33:PHE:O	4:D:37:TYR:OH	2.11	0.69
1:A:432:ARG:HH21	1:A:652:TYR:HB3	1.57	0.69
2:B:473:THR:HG22	2:B:474:GLN:HG2	1.74	0.69
1:A:393:LEU:O	1:A:400:ARG:NH2	2.21	0.68
1:A:431:ARG:NH1	1:A:435:GLN:O	2.27	0.68
4:D:8:LEU:HB2	4:D:58:THR:HB	1.76	0.67
3:C:125:VAL:HB	3:C:132:ILE:HD11	1.76	0.67
3:C:138:LEU:HD12	3:C:141:LYS:HD3	1.77	0.67
3:C:582:ILE:HD12	3:C:591:ILE:HG21	1.76	0.67
4:D:29:VAL:HG11	4:D:46:LEU:HD12	1.77	0.67
2:B:436:ASP:HB2	2:B:456:LYS:HD2	1.78	0.66
2:B:86:THR:OG1	2:B:89:ASN:O	2.14	0.66
3:C:642:PHE:HA	3:C:645:ILE:HD13	1.77	0.66
2:B:377:LYS:NZ	2:B:404:SER:OG	2.28	0.66
4:D:46:LEU:O	4:D:61:ILE:HB	1.96	0.66
1:A:403:VAL:HG23	1:A:514:LEU:HD11	1.77	0.65
3:C:326:THR:HG23	3:C:328:GLN:HG3	1.79	0.65
4:D:88:PHE:HD2	4:D:95:THR:HG23	1.62	0.65
4:D:11:VAL:HG22	4:D:83:CYS:HB3	1.78	0.64
1:A:407:LEU:HD23	1:A:430:VAL:HG23	1.78	0.64
3:C:147:LEU:HD23	3:C:148:LYS:HB2	1.80	0.64
1:A:419:ILE:O	1:A:491:LEU:N	2.26	0.64
4:D:94:ASN:HA	4:D:97:LYS:HD2	1.80	0.64
1:A:419:ILE:HD13	1:A:429:LEU:HB2	1.81	0.63
3:C:307:LEU:HD11	3:C:366:ILE:HG23	1.81	0.62
4:D:120:PHE:HB2	4:D:149:ILE:HD13	1.81	0.62
3:C:624:ARG:HH22	3:C:626:SER:HB2	1.65	0.62
3:C:616:PHE:O	3:C:619:ARG:NE	2.33	0.62
3:C:8:LEU:HB3	3:C:359:LEU:HD11	1.80	0.62
1:A:572:ARG:NH1	1:A:601:GLU:OE1	2.33	0.61
3:C:285:SER:N	3:C:310:ARG:O	2.30	0.61
2:B:239:ASP:N	2:B:239:ASP:OD2	2.33	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:377:LYS:HB3	2:B:392:VAL:HG12	1.81	0.61
4:D:17:SER:OG	4:D:67:GLN:NE2	2.34	0.60
3:C:135:TYR:HB2	3:C:144:LEU:HD22	1.82	0.60
1:A:404:SER:OG	1:A:650:LEU:HG	2.02	0.60
3:C:624:ARG:NH2	3:C:626:SER:HB2	2.17	0.60
3:C:589:ASP:O	3:C:619:ARG:NH1	2.34	0.60
4:D:78:TYR:HB3	4:D:110:ALA:HB2	1.84	0.60
3:C:547:ALA:HA	3:C:550:LEU:HB2	1.83	0.60
3:C:607:MET:HB2	3:C:646:PHE:HZ	1.66	0.59
3:C:621:GLN:HE22	3:C:625:GLY:HA2	1.67	0.59
3:C:29:ASP:O	3:C:33:LYS:N	2.36	0.59
3:C:181:HIS:HE1	3:C:183:ARG:HB3	1.66	0.59
3:C:1:MET:SD	3:C:310:ARG:NH1	2.75	0.59
2:B:329:ASP:OD1	2:B:330:ALA:N	2.30	0.58
1:A:276:SER:O	1:A:280:GLY:N	2.36	0.58
1:A:460:ALA:HB3	1:A:479:ILE:HD11	1.84	0.58
1:A:267:SER:OG	1:A:270:GLY:O	2.19	0.58
1:A:279:MET:HA	1:A:282:MET:HB2	1.85	0.58
3:C:583:ARG:HA	3:C:588:HIS:HB3	1.86	0.58
1:A:339:GLN:NE2	1:A:371:ILE:O	2.37	0.58
1:A:455:PHE:CD1	1:A:479:ILE:HG12	2.34	0.58
3:C:179:PRO:HB2	3:C:190:LEU:HD12	1.85	0.58
3:C:621:GLN:HB3	3:C:622:ARG:HH21	1.69	0.57
4:D:100:ASP:OD1	4:D:142:TRP:NE1	2.37	0.57
3:C:451:THR:OG1	3:C:452:GLN:N	2.37	0.57
1:A:569:GLU:OE2	1:A:572:ARG:NE	2.33	0.57
1:A:481:TYR:CD2	1:A:489:CYS:HB2	2.40	0.57
3:C:16:GLN:O	3:C:49:LYS:NZ	2.30	0.57
3:C:350:SER:O	3:C:354:GLY:N	2.38	0.57
3:C:348:ILE:HG13	3:C:357:TRP:HB2	1.86	0.56
1:A:249:ARG:O	1:A:321:ARG:NH2	2.38	0.56
3:C:610:TYR:C	3:C:612:ILE:H	2.08	0.56
1:A:290:GLU:OE1	1:A:310:ARG:NH1	2.38	0.56
2:B:111:ILE:HG13	2:B:123:GLU:HB3	1.86	0.56
2:B:479:PHE:CE1	3:C:556:LYS:HB2	2.40	0.56
3:C:616:PHE:HA	3:C:619:ARG:HE	1.70	0.56
1:A:515:ARG:HA	1:A:520:HIS:HB3	1.87	0.56
3:C:606:ASN:O	3:C:610:TYR:N	2.38	0.56
3:C:612:ILE:HA	3:C:615:PHE:HB3	1.87	0.56
2:B:219:ILE:HD11	2:B:338:PHE:CE2	2.40	0.56
3:C:551:SER:O	3:C:554:MET:HB3	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:549:SER:OG	1:A:552:SER:OG	2.20	0.56
3:C:245:HIS:HB3	3:C:253:LYS:HG3	1.88	0.56
1:A:481:TYR:CE2	1:A:489:CYS:HB2	2.41	0.56
1:A:485:ASP:OD1	1:A:485:ASP:N	2.33	0.56
1:A:396:ALA:HB3	1:A:399:VAL:HB	1.87	0.55
1:A:400:ARG:HD3	1:A:646:ILE:HG12	1.89	0.55
1:A:606:TRP:HB2	1:A:630:ILE:HD11	1.88	0.55
3:C:218:ILE:HG21	3:C:290:ILE:HD13	1.88	0.55
4:D:17:SER:HA	4:D:21:LYS:CG	2.37	0.55
1:A:380:ALA:HB1	1:A:571:GLU:HG2	1.89	0.55
1:A:589:ARG:NE	2:B:408:ASP:HB3	2.21	0.55
3:C:138:LEU:O	3:C:142:ARG:N	2.40	0.55
1:A:263:LYS:HE3	4:D:8:LEU:HD21	1.88	0.54
1:A:395:LEU:H	1:A:400:ARG:NH2	2.05	0.54
3:C:564:GLU:OE2	3:C:564:GLU:N	2.38	0.54
1:A:312:SER:OG	1:A:313:PRO:HD3	2.07	0.54
3:C:107:LYS:NZ	3:C:108:THR:OG1	2.41	0.54
3:C:405:SER:OG	3:C:407:PRO:HD2	2.08	0.54
1:A:374:ASN:OD1	1:A:375:LEU:N	2.40	0.54
1:A:260:GLU:OE2	1:A:310:ARG:NH2	2.41	0.54
1:A:323:ARG:HE	2:B:422:ARG:HD3	1.73	0.54
3:C:450:ARG:NH1	3:C:456:ASP:OD2	2.38	0.54
3:C:474:MET:SD	3:C:474:MET:N	2.80	0.54
3:C:615:PHE:HA	3:C:618:GLN:HB2	1.89	0.54
3:C:344:GLN:N	3:C:344:GLN:OE1	2.42	0.53
3:C:111:ALA:HB1	3:C:128:THR:HB	1.90	0.53
4:D:176:GLN:O	4:D:180:VAL:HG23	2.08	0.53
3:C:3:GLU:OE2	3:C:362:LYS:NZ	2.29	0.53
3:C:267:ALA:HB1	3:C:342:VAL:HG11	1.88	0.53
2:B:476:ASN:O	3:C:556:LYS:NZ	2.34	0.53
3:C:457:GLN:NE2	3:C:496:ALA:O	2.34	0.53
2:B:246:LYS:O	2:B:250:THR:OG1	2.19	0.53
1:A:284:ALA:O	1:A:288:PHE:N	2.38	0.53
3:C:39:ARG:O	3:C:44:THR:HA	2.09	0.53
3:C:32:ASN:O	3:C:34:GLN:NE2	2.39	0.53
3:C:180:PHE:HE1	3:C:189:LYS:HG2	1.74	0.53
3:C:440:ARG:NH1	3:C:445:LEU:O	2.38	0.53
4:D:52:VAL:HG21	4:D:170:ALA:HB3	1.91	0.53
1:A:516:LYS:HE3	1:A:517:ARG:HH21	1.74	0.53
3:C:630:THR:HB	3:C:631:PRO:HD2	1.90	0.53
3:C:64:LYS:HE2	3:C:83:ARG:HD2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:279:HIS:CE1	3:C:281:ASP:HB2	2.44	0.52
1:A:437:LEU:HD12	1:A:438:HIS:H	1.74	0.52
3:C:40:SER:HA	3:C:44:THR:HG22	1.90	0.52
3:C:260:LEU:HD11	3:C:277:VAL:HG11	1.91	0.52
3:C:100:LEU:HD22	3:C:142:ARG:HD3	1.91	0.52
4:D:96:PHE:HE2	4:D:139:ALA:HA	1.75	0.52
2:B:404:SER:OG	2:B:404:SER:O	2.26	0.52
3:C:157:TYR:HB2	3:C:166:ILE:HD11	1.92	0.52
1:A:358:ASN:O	1:A:358:ASN:ND2	2.43	0.52
2:B:208:SER:OG	3:C:485:GLU:OE2	2.28	0.52
4:D:36:GLN:HA	4:D:39:ALA:HB3	1.90	0.52
3:C:205:LYS:HD2	3:C:206:PRO:HD2	1.92	0.52
1:A:530:PRO:HG2	1:A:531:TYR:HD2	1.75	0.52
1:A:456:ARG:HG2	1:A:481:TYR:CE1	2.45	0.51
3:C:48:VAL:HB	3:C:57:ILE:HB	1.92	0.51
3:C:613:PHE:HA	3:C:616:PHE:HD2	1.74	0.51
3:C:177:LEU:HD11	3:C:195:ILE:HG12	1.92	0.51
3:C:605:ASP:O	3:C:607:MET:N	2.44	0.51
1:A:585:HIS:NE2	1:A:612:GLU:OE2	2.32	0.51
3:C:136:GLN:OE1	3:C:147:LEU:HB2	2.10	0.51
1:A:276:SER:O	1:A:278:THR:O	2.28	0.51
1:A:400:ARG:NH1	1:A:427:VAL:O	2.44	0.51
2:B:417:ASN:ND2	2:B:450:TYR:OH	2.44	0.51
3:C:411:THR:O	3:C:415:LYS:HG3	2.11	0.51
2:B:185:ASP:N	2:B:185:ASP:OD1	2.44	0.51
3:C:104:GLN:NE2	3:C:105:GLU:O	2.44	0.51
3:C:434:VAL:HG23	3:C:445:LEU:HD11	1.93	0.51
2:B:373:GLU:O	2:B:375:GLN:NE2	2.44	0.51
1:A:247:ALA:HA	1:A:250:LEU:HD11	1.92	0.51
3:C:342:VAL:HG12	3:C:348:ILE:HG22	1.93	0.51
1:A:368:SER:O	1:A:368:SER:OG	2.27	0.50
2:B:199:ASP:OD1	2:B:199:ASP:N	2.33	0.50
4:D:104:ASP:O	4:D:108:ILE:HG12	2.11	0.50
1:A:417:PHE:CE2	1:A:437:LEU:HD13	2.47	0.50
2:B:265:ASP:OD1	2:B:265:ASP:N	2.43	0.50
1:A:543:ARG:NE	1:A:618:SER:OG	2.42	0.50
2:B:336:LEU:O	2:B:340:ARG:HG3	2.12	0.50
1:A:304:TYR:HB2	1:A:320:ALA:O	2.11	0.50
2:B:193:ILE:HG21	2:B:231:LEU:HD22	1.93	0.50
3:C:548:HIS:CE1	3:C:572:LYS:HD3	2.46	0.50
1:A:360:ASP:OD2	1:A:362:ARG:HG2	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:419:ILE:HB	1:A:491:LEU:HB2	1.94	0.50
1:A:513:ARG:HB2	1:A:517:ARG:NH2	2.27	0.50
1:A:446:PHE:O	1:A:450:SER:OG	2.27	0.50
2:B:88:LYS:HG2	2:B:124:TYR:CE2	2.47	0.49
3:C:123:GLU:HB3	3:C:134:PHE:CE2	2.47	0.49
3:C:613:PHE:O	3:C:616:PHE:HB2	2.11	0.49
1:A:411:ARG:NH1	1:A:652:TYR:OXT	2.45	0.49
3:C:499:HIS:O	3:C:503:GLU:HG2	2.13	0.49
1:A:416:VAL:HA	1:A:432:ARG:HG3	1.93	0.49
1:A:619:PRO:HB2	3:C:576:LEU:HD11	1.93	0.49
2:B:245:TYR:O	2:B:249:THR:HG22	2.13	0.49
4:D:52:VAL:HG22	4:D:167:GLN:HE22	1.77	0.49
4:D:88:PHE:HB2	4:D:95:THR:OG1	2.12	0.49
1:A:466:LEU:HD13	1:A:469:PHE:HB3	1.94	0.49
1:A:487:ASP:OD1	1:A:487:ASP:N	2.42	0.49
3:C:624:ARG:HH21	3:C:630:THR:H	1.60	0.49
1:A:500:PHE:O	1:A:504:SER:HB2	2.13	0.49
1:A:573:LEU:HA	1:A:576:LEU:HD12	1.94	0.49
4:D:99:LEU:HD12	4:D:102:TRP:HD1	1.77	0.48
2:B:148:PHE:HZ	2:B:247:TYR:CZ	2.30	0.48
1:A:449:ILE:HD11	1:A:491:LEU:HD21	1.95	0.48
2:B:86:THR:OG1	2:B:89:ASN:OD1	2.27	0.48
3:C:258:LEU:HB3	3:C:288:PHE:CE1	2.49	0.48
1:A:455:PHE:HA	1:A:479:ILE:HD13	1.95	0.48
2:B:104:MET:HB2	2:B:138:LEU:HD13	1.95	0.48
3:C:243:LEU:HB2	3:C:256:HIS:HB2	1.95	0.48
3:C:510:VAL:HG23	3:C:515:PHE:CE1	2.49	0.48
4:D:21:LYS:HD2	4:D:21:LYS:HA	1.66	0.48
2:B:454:ASN:O	2:B:454:ASN:ND2	2.47	0.48
3:C:622:ARG:H	3:C:622:ARG:NE	2.12	0.48
4:D:39:ALA:C	4:D:41:ILE:H	2.17	0.48
1:A:533:SER:OG	1:A:534:VAL:N	2.47	0.48
3:C:624:ARG:HG3	3:C:625:GLY:H	1.79	0.48
3:C:71:LYS:HB2	3:C:116:PHE:CE2	2.49	0.47
4:D:126:LYS:HD3	4:D:129:LEU:HD13	1.96	0.47
1:A:356:LYS:HE3	1:A:358:ASN:HB3	1.96	0.47
3:C:312:ILE:HG13	3:C:336:TYR:OH	2.14	0.47
4:D:15:GLY:HA3	4:D:21:LYS:NZ	2.28	0.47
1:A:356:LYS:HG2	4:D:180:VAL:HG13	1.96	0.47
1:A:386:LEU:HG	1:A:387:MET:HG2	1.96	0.47
3:C:175:ASN:ND2	3:C:194:GLU:OE1	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:9:LEU:HD23	4:D:82:ASP:OD2	2.15	0.47
1:A:344:LEU:HD13	1:A:365:LEU:HD21	1.97	0.47
1:A:594:ILE:HG22	1:A:595:TYR:H	1.79	0.47
3:C:32:ASN:HB2	3:C:34:GLN:HG2	1.96	0.47
3:C:129:ASP:OD2	3:C:129:ASP:N	2.46	0.47
3:C:516:TYR:O	3:C:520:GLN:HG3	2.15	0.47
1:A:430:VAL:HG13	1:A:650:LEU:HB3	1.96	0.47
1:A:466:LEU:HD11	1:A:475:PHE:CD1	2.49	0.47
1:A:604:LEU:HD23	1:A:605:ALA:N	2.29	0.47
2:B:210:ILE:HD11	2:B:225:PHE:HB2	1.97	0.47
3:C:12:GLU:OE1	3:C:12:GLU:N	2.47	0.47
3:C:317:ILE:HD11	3:C:333:CYS:HB3	1.96	0.47
3:C:171:THR:HG22	3:C:173:LEU:H	1.79	0.47
4:D:39:ALA:HB1	4:D:44:ASP:OD1	2.15	0.47
3:C:133:GLU:OE2	3:C:135:TYR:OH	2.27	0.47
3:C:245:HIS:N	3:C:253:LYS:O	2.48	0.47
3:C:417:ASN:HD22	3:C:489:SER:HB2	1.80	0.47
4:D:46:LEU:HD21	4:D:63:ASP:OD1	2.14	0.46
2:B:302:PHE:HD1	2:B:309:TYR:HE1	1.62	0.46
3:C:29:ASP:O	3:C:33:LYS:CA	2.64	0.46
3:C:181:HIS:CE1	3:C:183:ARG:HE	2.33	0.46
3:C:315:TYR:HB3	3:C:333:CYS:SG	2.55	0.46
3:C:610:TYR:C	3:C:612:ILE:N	2.69	0.46
2:B:185:ASP:OD2	2:B:393:HIS:NE2	2.37	0.46
2:B:217:LEU:O	2:B:219:ILE:N	2.48	0.46
3:C:344:GLN:HA	3:C:345:PRO:HA	1.66	0.46
1:A:432:ARG:NH2	1:A:652:TYR:HB3	2.29	0.46
2:B:243:ILE:H	2:B:243:ILE:HG12	1.46	0.46
2:B:440:VAL:HG11	2:B:467:VAL:HG21	1.98	0.46
3:C:209:SER:OG	3:C:210:GLU:N	2.49	0.46
1:A:344:LEU:HD22	1:A:365:LEU:HD21	1.98	0.46
2:B:48:TYR:OH	2:B:61:ASN:ND2	2.48	0.46
4:D:38:LYS:O	4:D:43:ALA:N	2.43	0.46
1:A:524:ARG:O	1:A:528:ARG:NH1	2.48	0.46
2:B:146:LYS:HA	2:B:150:GLY:O	2.16	0.46
3:C:629:PHE:HB3	3:C:635:CYS:HB2	1.97	0.46
1:A:274:ALA:O	1:A:276:SER:N	2.47	0.46
1:A:374:ASN:O	1:A:377:GLN:N	2.48	0.46
1:A:392:CYS:SG	1:A:645:PHE:HA	2.56	0.46
1:A:546:LEU:HD23	1:A:557:SER:HB2	1.97	0.46
3:C:158:MET:O	3:C:166:ILE:HD12	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:500:PHE:O	1:A:504:SER:CB	2.64	0.46
2:B:42:GLU:OE1	2:B:55:LYS:NZ	2.39	0.46
3:C:5:ASP:HB3	3:C:310:ARG:NH1	2.30	0.46
3:C:181:HIS:CE1	3:C:183:ARG:HB3	2.48	0.46
3:C:613:PHE:HA	3:C:616:PHE:CD2	2.51	0.46
3:C:624:ARG:NH2	3:C:629:PHE:HA	2.31	0.46
1:A:624:ALA:HA	2:B:461:ILE:HD11	1.97	0.45
1:A:452:SER:HB3	1:A:455:PHE:CE2	2.51	0.45
2:B:59:ILE:HD12	4:D:69:ARG:HH11	1.82	0.45
2:B:90:ARG:HD2	2:B:129:LEU:HD12	1.98	0.45
3:C:633:GLU:HG3	3:C:633:GLU:O	2.17	0.45
4:D:59:MET:HE2	4:D:61:ILE:HD11	1.98	0.45
1:A:241:GLU:O	1:A:245:THR:HG22	2.17	0.45
1:A:336:ILE:HD11	1:A:376:LEU:HD21	1.98	0.45
2:B:96:PRO:HD2	2:B:100:PHE:O	2.16	0.45
4:D:86:LEU:HD13	4:D:122:VAL:HG22	1.99	0.45
2:B:141:CYS:HA	2:B:175:TYR:HE1	1.82	0.45
3:C:519:HIS:ND1	3:C:544:TYR:OH	2.23	0.45
4:D:10:LYS:HD3	4:D:80:GLY:O	2.16	0.45
1:A:440:ILE:O	1:A:444:LEU:HG	2.17	0.45
1:A:480:SER:OG	1:A:507:ARG:NE	2.50	0.45
2:B:143:SER:HB3	2:B:243:ILE:HD12	1.98	0.45
2:B:222:TYR:HB2	2:B:327:MET:HB2	1.99	0.45
3:C:180:PHE:CE1	3:C:189:LYS:HG2	2.51	0.45
1:A:281:VAL:HG12	1:A:285:LEU:HD13	1.99	0.45
2:B:141:CYS:SG	2:B:179:LEU:HD11	2.57	0.45
1:A:282:MET:SD	1:A:317:VAL:HG11	2.56	0.44
1:A:276:SER:O	1:A:278:THR:C	2.56	0.44
1:A:602:ASN:O	1:A:617:TYR:HB2	2.17	0.44
2:B:430:ILE:HD12	2:B:460:LEU:HD11	2.00	0.44
3:C:141:LYS:HD2	3:C:141:LYS:N	2.32	0.44
3:C:622:ARG:H	3:C:622:ARG:HE	1.65	0.44
4:D:84:CYS:HB2	4:D:106:PHE:CZ	2.52	0.44
1:A:378:LEU:HB3	1:A:385:PHE:HE2	1.82	0.44
2:B:353:LEU:O	2:B:357:ILE:HG13	2.17	0.44
2:B:408:ASP:OD2	2:B:408:ASP:N	2.50	0.44
3:C:138:LEU:HD23	3:C:145:LYS:HG2	2.00	0.44
1:A:320:ALA:HB3	1:A:329:LEU:HD11	2.00	0.44
1:A:369:GLU:O	1:A:373:ASP:N	2.51	0.44
2:B:216:SER:O	2:B:216:SER:OG	2.36	0.44
2:B:363:ILE:HA	2:B:366:ARG:HH11	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:635:CYS:O	3:C:638:HIS:N	2.51	0.44
1:A:463:PRO:HB2	1:A:474:PHE:CD1	2.52	0.44
1:A:383:PRO:HB3	1:A:574:LEU:HD11	1.99	0.44
1:A:449:ILE:CD1	1:A:491:LEU:HD21	2.48	0.44
2:B:359:GLU:O	2:B:363:ILE:HG12	2.18	0.44
3:C:531:LYS:HB3	3:C:532:PRO:HD3	2.00	0.44
1:A:258:LEU:HD12	1:A:279:MET:SD	2.58	0.43
1:A:594:ILE:HG22	1:A:595:TYR:N	2.33	0.43
2:B:463:VAL:O	2:B:467:VAL:HG23	2.18	0.43
3:C:31:ALA:HA	3:C:161:PRO:HG2	1.99	0.43
1:A:395:LEU:HD21	1:A:523:LEU:HD13	1.99	0.43
1:A:642:ASP:HA	1:A:647:LEU:HD21	2.00	0.43
3:C:16:GLN:NE2	3:C:17:PHE:O	2.51	0.43
3:C:178:GLN:NE2	3:C:179:PRO:O	2.51	0.43
1:A:306:VAL:HG22	1:A:319:VAL:HG13	2.01	0.43
1:A:583:ARG:HA	1:A:583:ARG:HD3	1.85	0.43
2:B:55:LYS:O	2:B:59:ILE:HG13	2.17	0.43
3:C:107:LYS:HE3	3:C:107:LYS:HB3	1.89	0.43
4:D:155:SER:O	4:D:159:ALA:N	2.52	0.43
3:C:75:GLU:HB3	3:C:77:LYS:HZ3	1.83	0.43
3:C:90:PHE:HB2	3:C:102:TYR:CZ	2.53	0.43
3:C:244:TYR:HA	3:C:254:LYS:HA	1.99	0.43
1:A:385:PHE:CE1	1:A:443:HIS:HB3	2.53	0.43
1:A:441:ASP:O	1:A:445:LEU:HG	2.18	0.43
1:A:524:ARG:O	1:A:528:ARG:HG2	2.18	0.43
2:B:424:ASP:N	2:B:424:ASP:OD1	2.52	0.43
3:C:613:PHE:CZ	3:C:629:PHE:HB2	2.54	0.43
3:C:619:ARG:HD2	3:C:620:ASN:HD22	1.84	0.43
1:A:416:VAL:HA	1:A:432:ARG:CG	2.48	0.43
1:A:524:ARG:HB3	1:A:528:ARG:NH2	2.34	0.43
2:B:247:TYR:CZ	2:B:252:LEU:HD12	2.54	0.43
3:C:137:VAL:HA	3:C:144:LEU:HD23	2.01	0.43
3:C:555:LEU:O	3:C:558:LEU:HB2	2.19	0.43
3:C:209:SER:N	3:C:212:ASP:OD2	2.51	0.43
3:C:289:ASP:OD1	3:C:291:LYS:N	2.47	0.43
3:C:617:GLU:HB3	3:C:621:GLN:HB2	2.01	0.43
3:C:618:GLN:C	3:C:622:ARG:HH22	2.21	0.43
4:D:86:LEU:HD11	4:D:120:PHE:HB3	2.00	0.43
1:A:356:LYS:HG3	1:A:358:ASN:H	1.83	0.43
1:A:415:LEU:HD12	1:A:415:LEU:HA	1.77	0.43
3:C:244:TYR:CE1	3:C:254:LYS:HB3	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:468:PHE:HE2	3:C:474:MET:HG3	1.84	0.43
1:A:415:LEU:HD21	1:A:492:LEU:HD22	2.00	0.43
1:A:596:TYR:HB3	1:A:603:LEU:HD12	2.01	0.43
2:B:196:PHE:O	3:C:524:TYR:OH	2.13	0.43
3:C:587:GLY:O	3:C:591:ILE:HG23	2.19	0.43
3:C:212:ASP:O	3:C:213:ILE:HD13	2.19	0.42
3:C:575:VAL:HG21	3:C:609:PHE:HE2	1.84	0.42
1:A:476:HIS:O	1:A:494:SER:N	2.47	0.42
2:B:393:HIS:HA	2:B:403:THR:HA	2.01	0.42
3:C:138:LEU:HB3	3:C:141:LYS:HB2	2.00	0.42
3:C:613:PHE:HZ	3:C:629:PHE:H	1.66	0.42
1:A:257:VAL:HG22	1:A:316:LEU:HB3	2.01	0.42
1:A:353:PHE:CE1	1:A:359:TYR:HB3	2.53	0.42
2:B:97:GLU:OE2	2:B:152:PHE:HB2	2.20	0.42
2:B:268:ILE:O	2:B:272:MET:HG2	2.20	0.42
3:C:293:ARG:HH12	3:C:375:ARG:HG3	1.83	0.42
4:D:16:ASP:O	4:D:21:LYS:HD3	2.19	0.42
4:D:39:ALA:HB1	4:D:44:ASP:HA	2.02	0.42
4:D:153:GLU:O	4:D:153:GLU:HG2	2.19	0.42
3:C:77:LYS:HB2	3:C:78:ILE:HD12	2.01	0.42
3:C:588:HIS:HA	3:C:591:ILE:HD13	2.00	0.42
3:C:644:GLN:H	3:C:644:GLN:CD	2.23	0.42
4:D:52:VAL:HG21	4:D:170:ALA:CB	2.50	0.42
4:D:100:ASP:CG	4:D:142:TRP:HE1	2.22	0.42
2:B:40:GLN:HB3	2:B:43:ASN:HD22	1.85	0.42
2:B:146:LYS:HE2	2:B:146:LYS:HB3	1.93	0.42
3:C:468:PHE:CE2	3:C:474:MET:HG3	2.54	0.42
3:C:558:LEU:HD23	3:C:558:LEU:HA	1.84	0.42
1:A:268:ARG:HG3	1:A:269:TYR:CD1	2.54	0.42
1:A:421:LEU:HD22	1:A:446:PHE:CE1	2.55	0.42
2:B:254:PRO:HA	2:B:257:ILE:HG22	2.02	0.42
1:A:532:TYR:OH	1:A:556:THR:OG1	2.30	0.42
2:B:198:LEU:HD23	2:B:198:LEU:HA	1.83	0.42
2:B:209:PHE:CZ	2:B:350:LEU:HD13	2.55	0.42
2:B:285:GLY:HA3	2:B:298:PHE:CE1	2.55	0.42
3:C:205:LYS:HD2	3:C:205:LYS:HA	1.87	0.42
3:C:293:ARG:NH1	3:C:375:ARG:HG3	2.35	0.42
1:A:304:TYR:HB3	1:A:321:ARG:HG3	2.02	0.42
1:A:420:LEU:O	1:A:427:VAL:HB	2.20	0.42
1:A:503:VAL:O	1:A:506:CYS:HB2	2.20	0.42
3:C:102:TYR:CD1	3:C:142:ARG:HG2	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:624:ARG:HH21	3:C:630:THR:N	2.18	0.42
4:D:38:LYS:HG3	4:D:42:GLY:HA3	2.02	0.42
1:A:251:HIS:HD2	1:A:269:TYR:CG	2.37	0.41
3:C:126:PHE:O	3:C:132:ILE:HD12	2.20	0.41
3:C:156:TRP:NE1	3:C:174:GLU:OE2	2.48	0.41
3:C:432:MET:O	3:C:435:GLU:HG3	2.19	0.41
2:B:302:PHE:CD1	2:B:309:TYR:HE1	2.38	0.41
3:C:29:ASP:O	3:C:33:LYS:HA	2.19	0.41
3:C:178:GLN:OE1	3:C:192:LYS:HG3	2.20	0.41
1:A:339:GLN:HG2	1:A:372:THR:HG23	2.02	0.41
1:A:452:SER:HB3	1:A:455:PHE:HE2	1.84	0.41
1:A:468:LYS:HD3	1:A:468:LYS:HA	1.71	0.41
1:A:574:LEU:HD12	1:A:574:LEU:HA	1.72	0.41
3:C:36:PHE:CD1	3:C:48:VAL:HG22	2.55	0.41
3:C:634:HIS:HE1	3:C:637:GLU:OE1	2.03	0.41
4:D:111:SER:O	4:D:111:SER:OG	2.35	0.41
1:A:253:LYS:NZ	1:A:332:GLU:OE2	2.53	0.41
1:A:420:LEU:HA	1:A:490:LEU:HA	2.01	0.41
3:C:327:SER:O	3:C:327:SER:OG	2.34	0.41
2:B:256:HIS:HB3	2:B:283:LEU:HD22	2.03	0.41
3:C:621:GLN:NE2	3:C:625:GLY:HA2	2.33	0.41
4:D:24:LEU:O	4:D:27:GLN:NE2	2.47	0.41
1:A:334:LEU:HD23	1:A:334:LEU:HA	1.88	0.41
1:A:529:THR:HG23	1:A:529:THR:O	2.20	0.41
2:B:380:TYR:CD1	2:B:475:PHE:HE1	2.38	0.41
2:B:420:PHE:HD1	2:B:420:PHE:HA	1.73	0.41
3:C:179:PRO:HG3	3:C:193:PHE:HE1	1.86	0.41
3:C:281:ASP:OD1	3:C:281:ASP:N	2.51	0.41
4:D:105:GLU:O	4:D:109:GLN:HG2	2.20	0.41
1:A:414:SER:OG	1:A:414:SER:O	2.37	0.41
3:C:226:PHE:CE1	3:C:228:ARG:HB2	2.55	0.41
1:A:349:LEU:HD23	1:A:349:LEU:HA	1.92	0.41
1:A:539:ILE:HD11	1:A:632:LYS:HB3	2.02	0.41
1:A:589:ARG:HA	1:A:589:ARG:NH1	2.36	0.41
2:B:151:THR:HG23	2:B:309:TYR:OH	2.21	0.41
2:B:218:ASN:OD1	2:B:218:ASN:N	2.52	0.41
2:B:393:HIS:CD2	2:B:403:THR:HG22	2.56	0.41
3:C:123:GLU:HB3	3:C:134:PHE:HE2	1.84	0.41
4:D:89:ASP:H	4:D:95:THR:HG21	1.86	0.41
1:A:263:LYS:H	1:A:263:LYS:HG2	1.57	0.40
1:A:527:LEU:O	1:A:527:LEU:HD23	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:15:VAL:HB	3:C:356:LEU:HB3	2.02	0.40
3:C:118:TRP:CE2	3:C:124:ILE:HD12	2.56	0.40
1:A:320:ALA:HB2	1:A:329:LEU:HD21	2.02	0.40
2:B:116:LYS:HB2	2:B:116:LYS:HE3	1.73	0.40
3:C:230:HIS:CE1	3:C:236:SER:HA	2.56	0.40
2:B:405:VAL:HG22	2:B:406:HIS:H	1.86	0.40
3:C:9:GLU:O	3:C:359:LEU:HD12	2.20	0.40
3:C:307:LEU:HD23	3:C:307:LEU:HA	1.83	0.40
3:C:341:ILE:HB	3:C:349:ILE:HG22	2.03	0.40
4:D:52:VAL:HG22	4:D:167:GLN:NE2	2.35	0.40
3:C:158:MET:SD	3:C:215:MET:HG3	2.61	0.40
2:B:25:LEU:HB3	2:B:105:VAL:HG12	2.04	0.40
2:B:90:ARG:HD2	2:B:129:LEU:HB2	2.02	0.40
2:B:396:LYS:HA	2:B:396:LYS:HD3	1.79	0.40
2:B:432:LYS:HD2	2:B:438:TRP:CZ2	2.56	0.40
3:C:258:LEU:HD13	3:C:288:PHE:CG	2.56	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	415/418 (99%)	388 (94%)	26 (6%)	1 (0%)	44 73
2	B	464/482 (96%)	431 (93%)	33 (7%)	0	100 100
3	C	655/657 (100%)	615 (94%)	39 (6%)	1 (0%)	44 73
4	D	176/207 (85%)	162 (92%)	14 (8%)	0	100 100
All	All	1710/1764 (97%)	1596 (93%)	112 (6%)	2 (0%)	50 78

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	606	ASN
1	A	563	PRO

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	359/359 (100%)	312 (87%)	47 (13%)	3 13
2	B	431/436 (99%)	408 (95%)	23 (5%)	19 44
3	C	593/593 (100%)	556 (94%)	37 (6%)	15 40
4	D	155/181 (86%)	143 (92%)	12 (8%)	10 33
All	All	1538/1569 (98%)	1419 (92%)	119 (8%)	13 33

All (119) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	237	THR
1	A	250	LEU
1	A	251	HIS
1	A	256	PHE
1	A	258	LEU
1	A	263	LYS
1	A	268	ARG
1	A	287	SER
1	A	289	LEU
1	A	316	LEU
1	A	323	ARG
1	A	340	ILE
1	A	341	LEU
1	A	343	LEU
1	A	345	THR
1	A	353	PHE
1	A	359	TYR
1	A	362	ARG
1	A	368	SER
1	A	373	ASP

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Mol	Chain	Res	Type
1	A	386	LEU
1	A	406	SER
1	A	408	GLN
1	A	436	PHE
1	A	448	LEU
1	A	466	LEU
1	A	490	LEU
1	A	496	ASP
1	A	497	ARG
1	A	508	ARG
1	A	514	LEU
1	A	516	LYS
1	A	520	HIS
1	A	536	GLN
1	A	560	ILE
1	A	565	THR
1	A	570	GLN
1	A	571	GLU
1	A	602	ASN
1	A	603	LEU
1	A	608	THR
1	A	625	SER
1	A	638	ARG
1	A	644	LEU
1	A	650	LEU
1	A	651	THR
1	A	652	TYR
2	B	78	SER
2	B	84	LEU
2	B	114	GLN
2	B	131	ASP
2	B	199	ASP
2	B	239	ASP
2	B	243	ILE
2	B	264	ARG
2	B	297	ARG
2	B	309	TYR
2	B	333	HIS
2	B	337	ASP
2	B	353	LEU
2	B	376	PHE
2	B	386	LEU

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Mol	Chain	Res	Type
2	B	404	SER
2	B	406	HIS
2	B	420	PHE
2	B	436	ASP
2	B	449	LEU
2	B	477	ASN
2	B	479	PHE
2	B	480	PHE
3	C	5	ASP
3	C	19	LYS
3	C	32	ASN
3	C	38	VAL
3	C	60	ARG
3	C	90	PHE
3	C	135	TYR
3	C	157	TYR
3	C	170	THR
3	C	209	SER
3	C	217	THR
3	C	232	ARG
3	C	252	CYS
3	C	281	ASP
3	C	293	ARG
3	C	348	ILE
3	C	358	ASN
3	C	405	SER
3	C	406	LEU
3	C	451	THR
3	C	474	MET
3	C	488	ARG
3	C	529	ASP
3	C	530	SER
3	C	531	LYS
3	C	552	LEU
3	C	567	GLU
3	C	576	LEU
3	C	597	LEU
3	C	603	THR
3	C	619	ARG
3	C	622	ARG
3	C	628	ASN
3	C	629	PHE

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Mol	Chain	Res	Type
3	C	639	VAL
3	C	642	PHE
3	C	652	MET
4	D	23	SER
4	D	24	LEU
4	D	32	LYS
4	D	37	TYR
4	D	38	LYS
4	D	40	THR
4	D	46	LEU
4	D	57	VAL
4	D	86	LEU
4	D	88	PHE
4	D	129	LEU
4	D	177	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	251	HIS
1	A	327	GLN
1	A	339	GLN
1	A	358	ASN
1	A	374	ASN
1	A	377	GLN
1	A	424	ASN
1	A	425	GLN
1	A	447	ASN
1	A	520	HIS
1	A	544	HIS
1	A	570	GLN
2	B	43	ASN
2	B	85	HIS
2	B	99	ASN
2	B	108	ASN
2	B	149	ASN
2	B	211	ASN
2	B	375	GLN
2	B	417	ASN
2	B	454	ASN
3	C	24	ASN
3	C	34	GLN

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Mol	Chain	Res	Type
3	C	150	HIS
3	C	155	ASN
3	C	181	HIS
3	C	245	HIS
3	C	278	HIS
3	C	353	GLN
3	C	382	GLN
3	C	511	GLN
3	C	562	ASN
3	C	620	ASN
3	C	634	HIS
4	D	22	ASN
4	D	67	GLN
4	D	148	ASN
4	D	176	GLN

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.

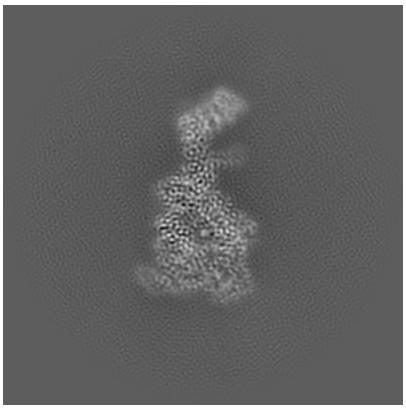
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-62697. These allow visual inspection of the internal detail of the map and identification of artifacts.

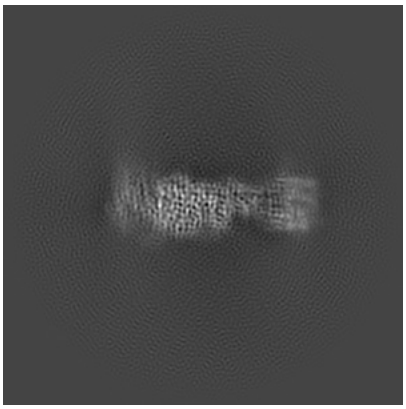
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

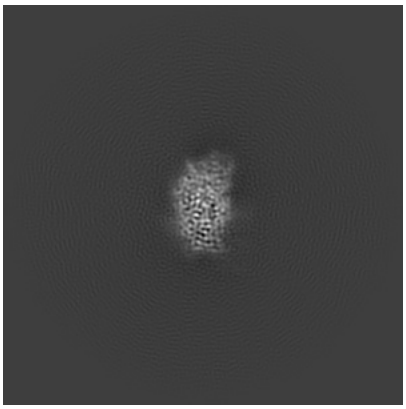
6.1.1 Primary map



X

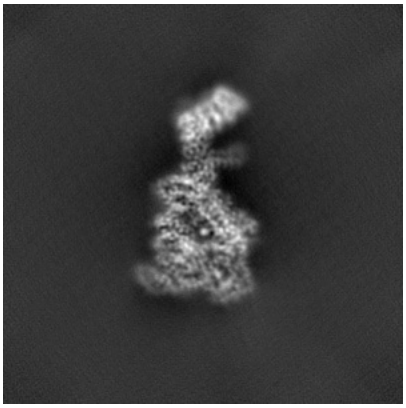


Y

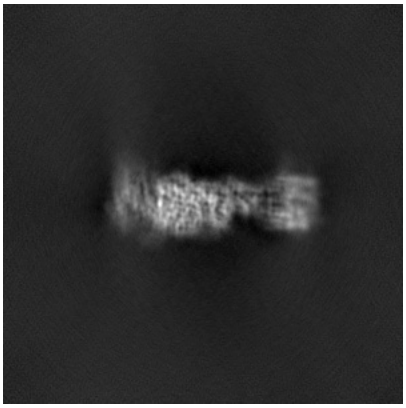


Z

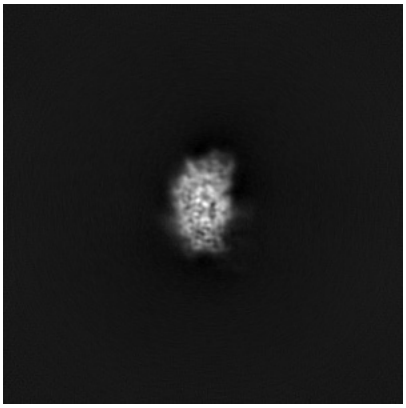
6.1.2 Raw map



X



Y

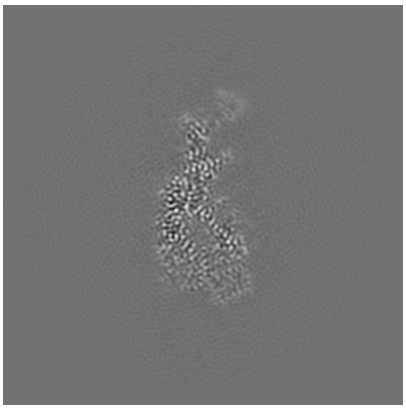


Z

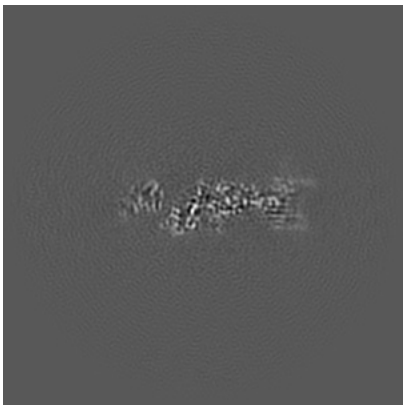
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

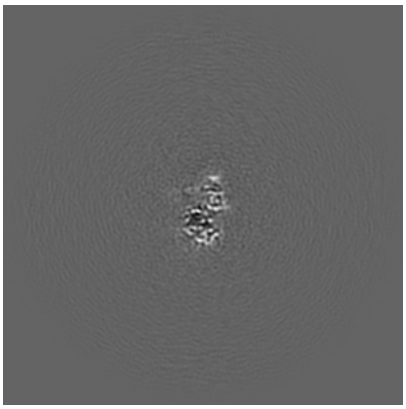
6.2.1 Primary map



X Index: 150

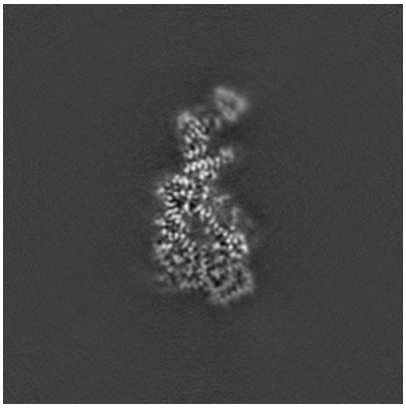


Y Index: 150

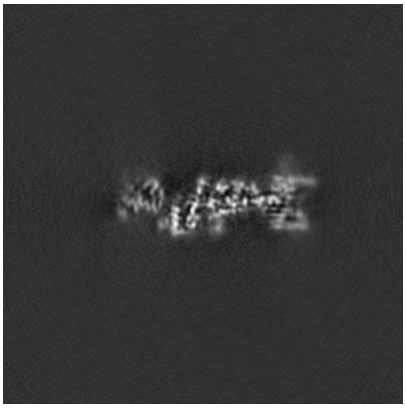


Z Index: 150

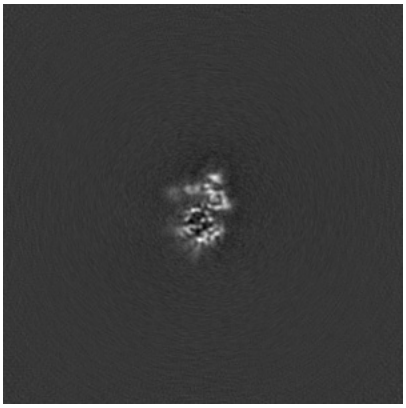
6.2.2 Raw map



X Index: 150



Y Index: 150

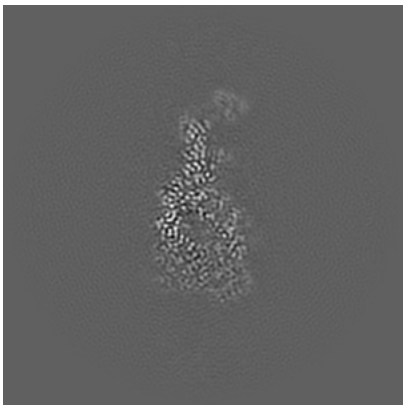


Z Index: 150

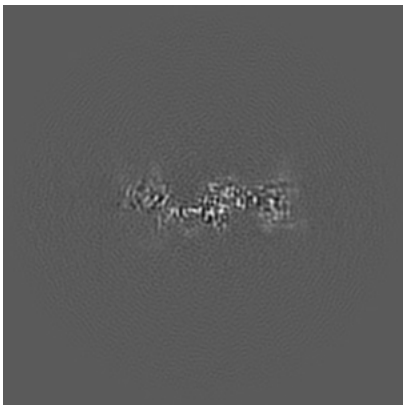
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

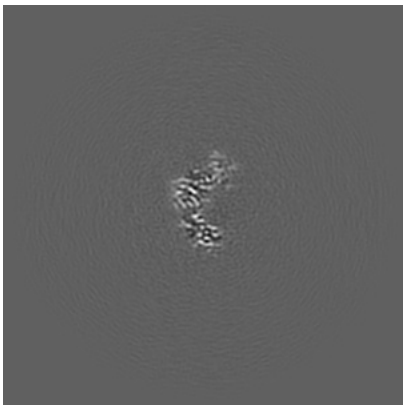
6.3.1 Primary map



X Index: 152

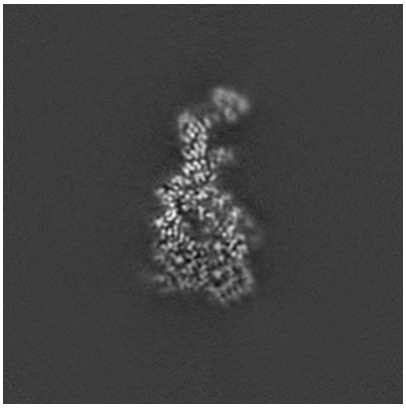


Y Index: 142

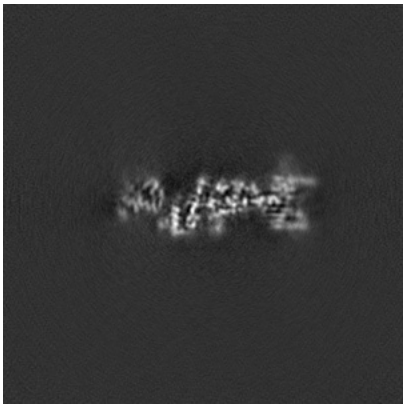


Z Index: 130

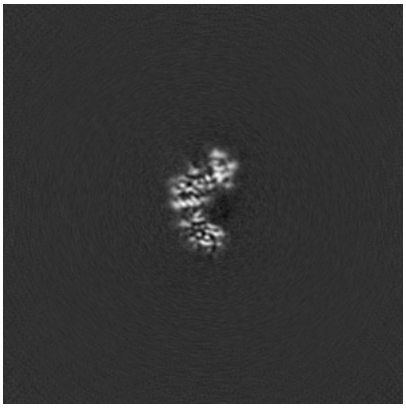
6.3.2 Raw map



X Index: 152



Y Index: 150

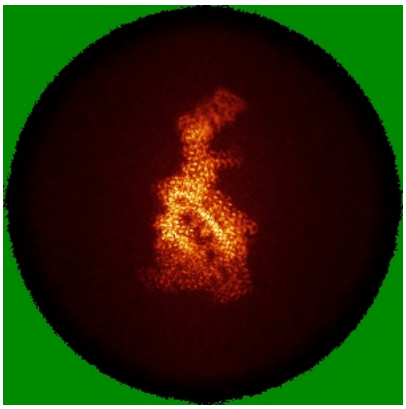


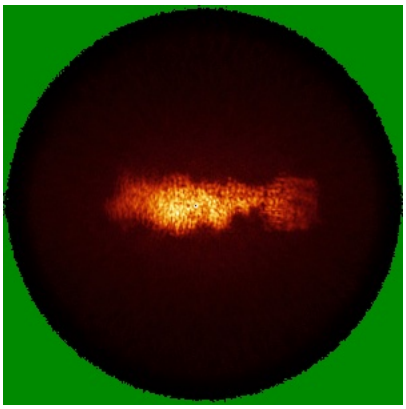
Z Index: 129

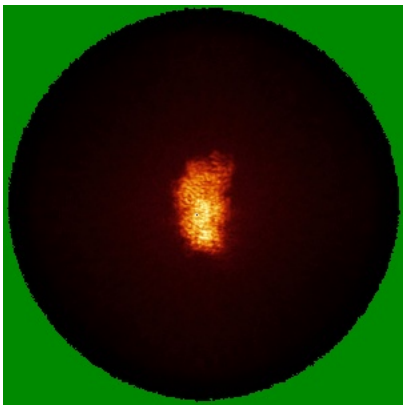
The images above show the largest variance slices of the map in three orthogonal directions.

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

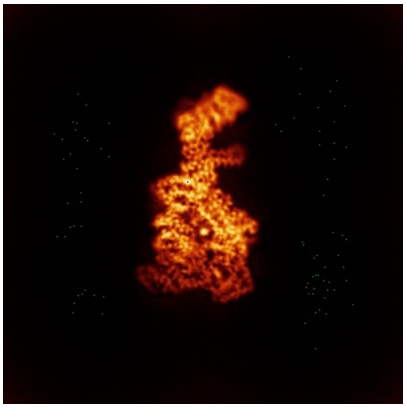
6.4.1 Primary map

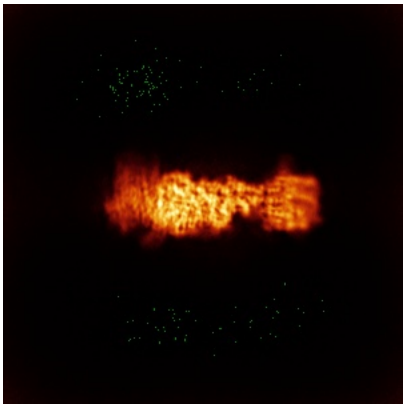

X

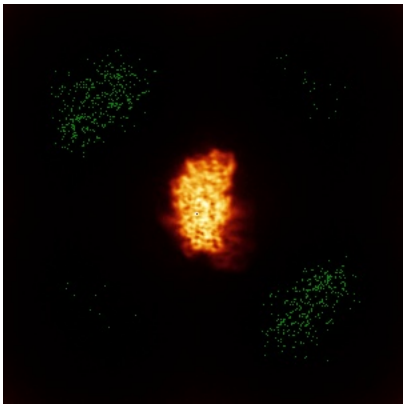

Y


Z

6.4.2 Raw map


X

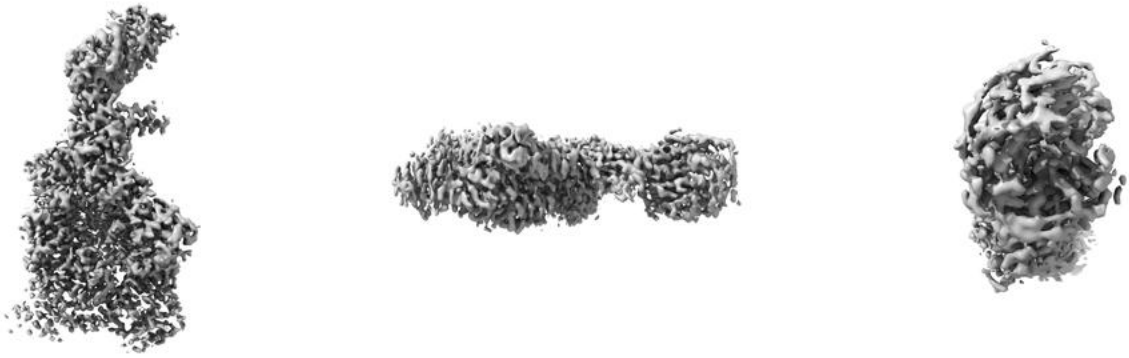

Y


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 0.459. 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.

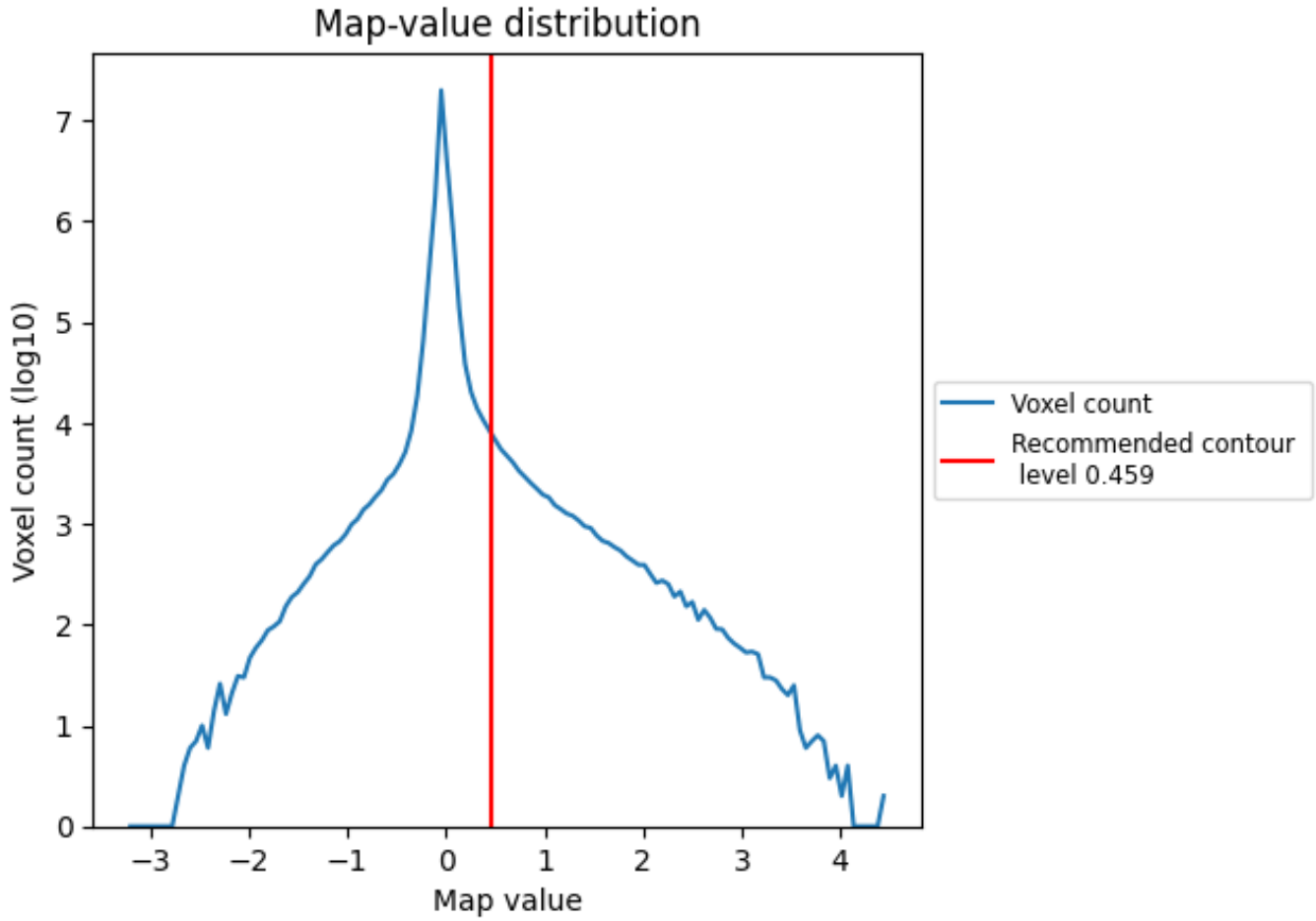
6.6 Mask visualisation (i)

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

7 Map analysis

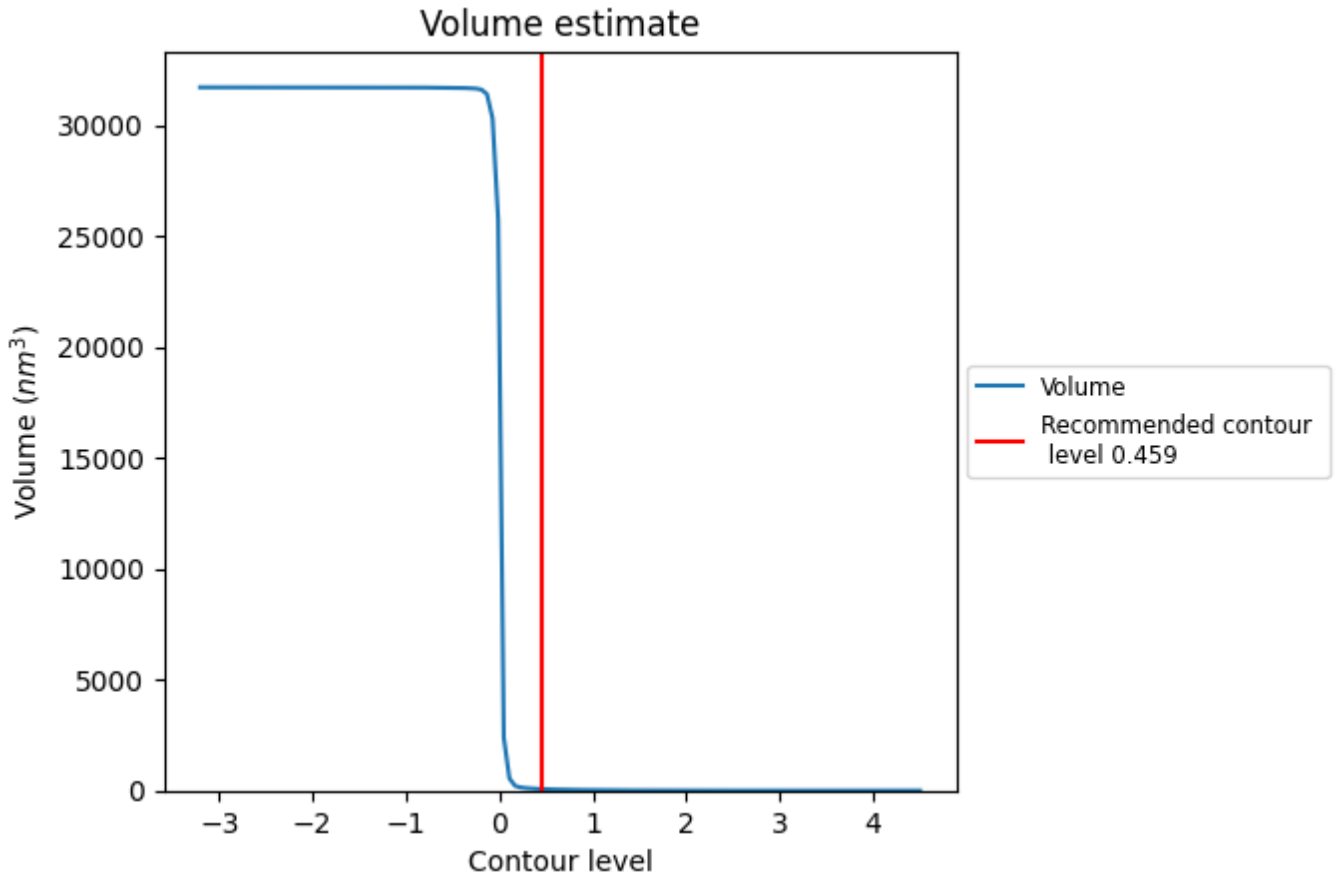
This section contains the results of statistical analysis of the map.

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.

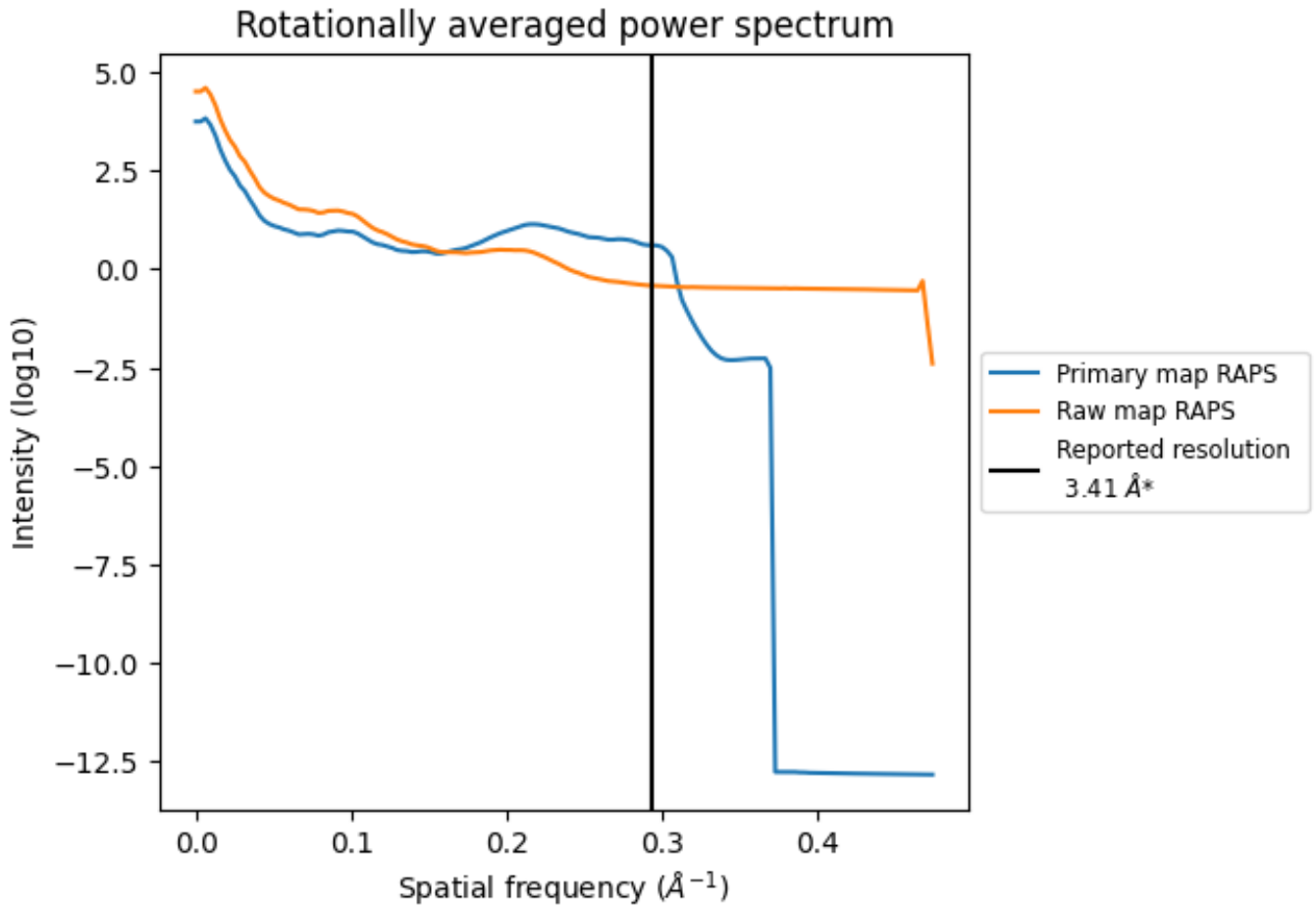
7.2 Volume estimate



The volume at the recommended contour level is 68 nm^3; this corresponds to an approximate mass of 61 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)

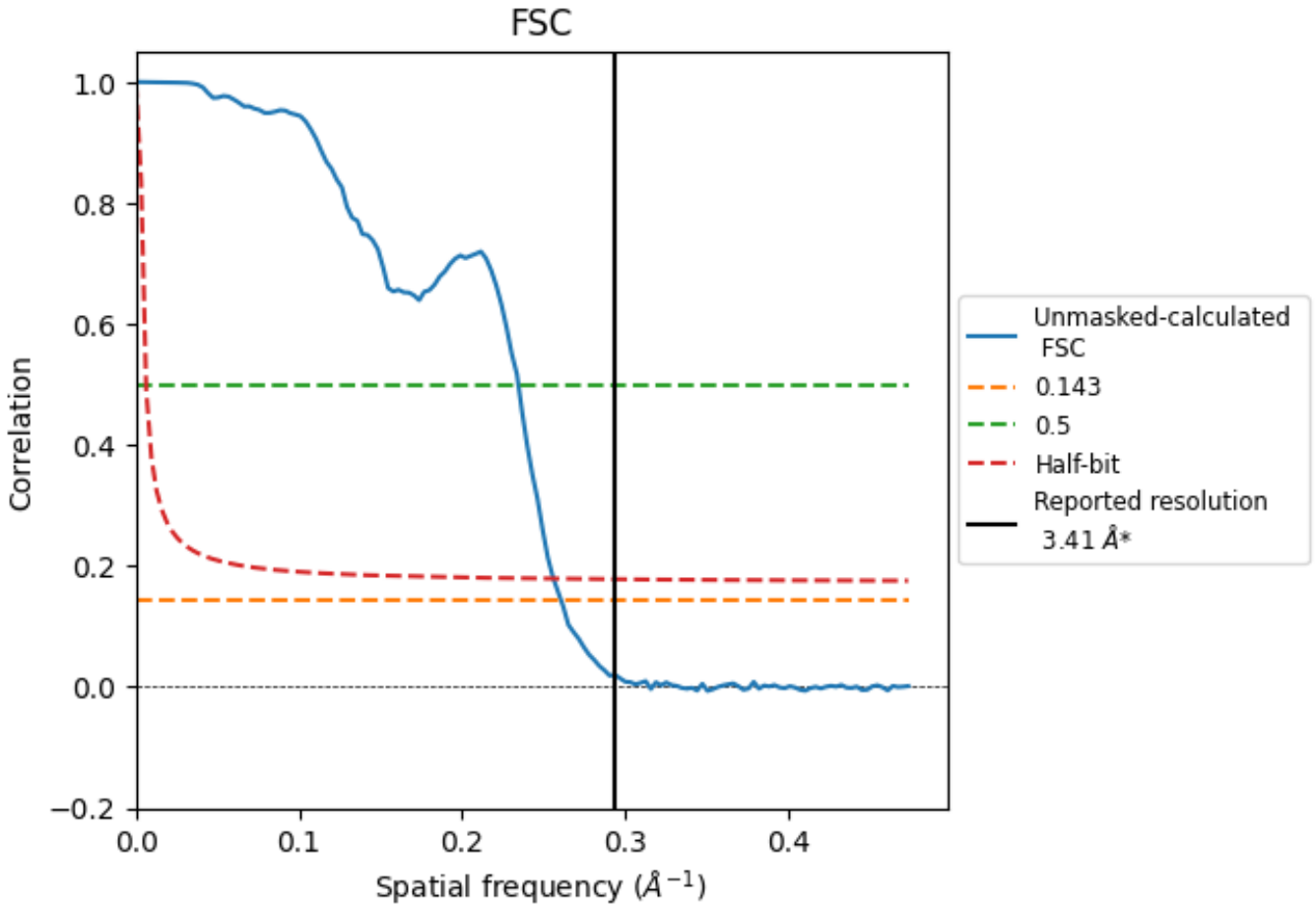


*Reported resolution corresponds to spatial frequency of 0.293 $Å^{-1}$

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 0.293 Å^{-1}

8.2 Resolution estimates (i)

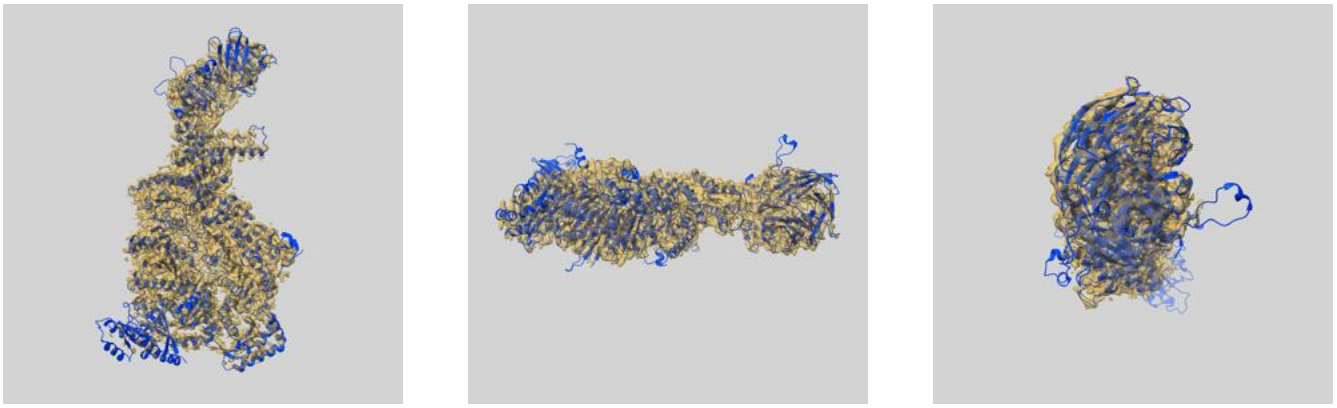
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.41	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.83	4.26	3.90

*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 3.83 differs from the reported value 3.41 by more than 10 %

9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-62697 and PDB model 9L0D. Per-residue inclusion information can be found in section 3 on page 4.

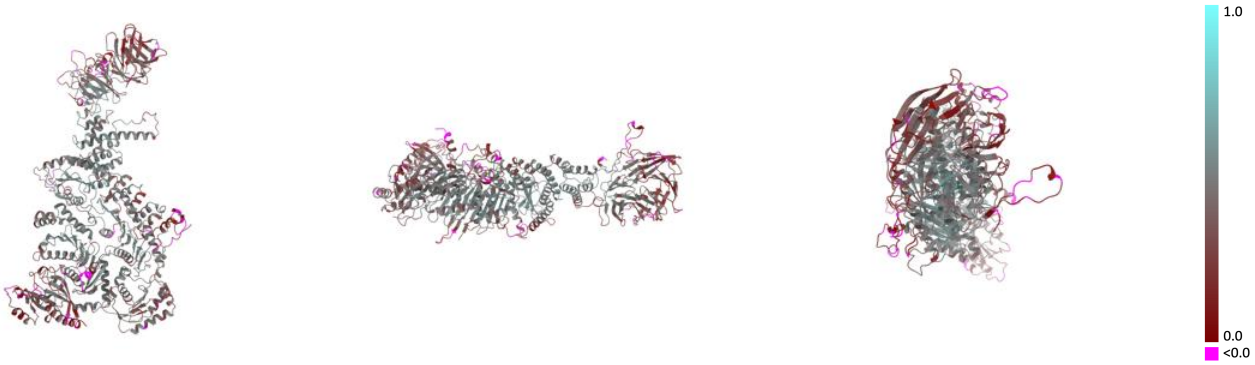
9.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.459 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.

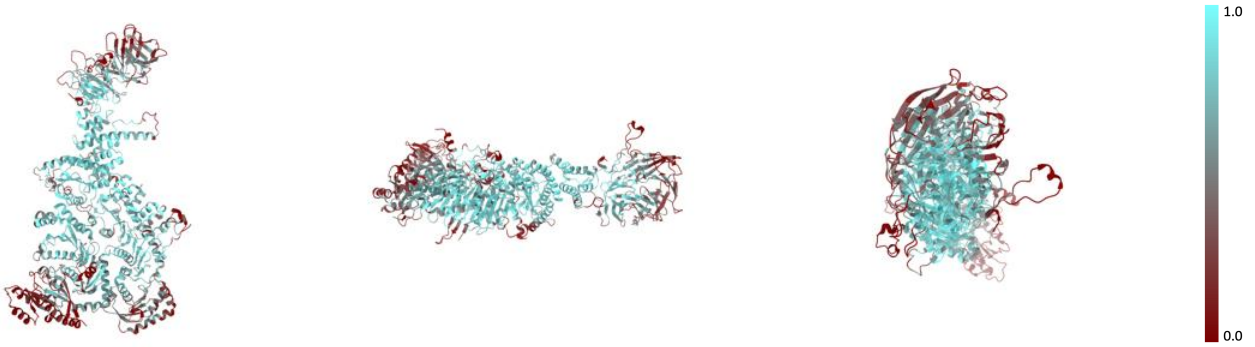
9.2 Q-score mapped to coordinate model (i)



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.

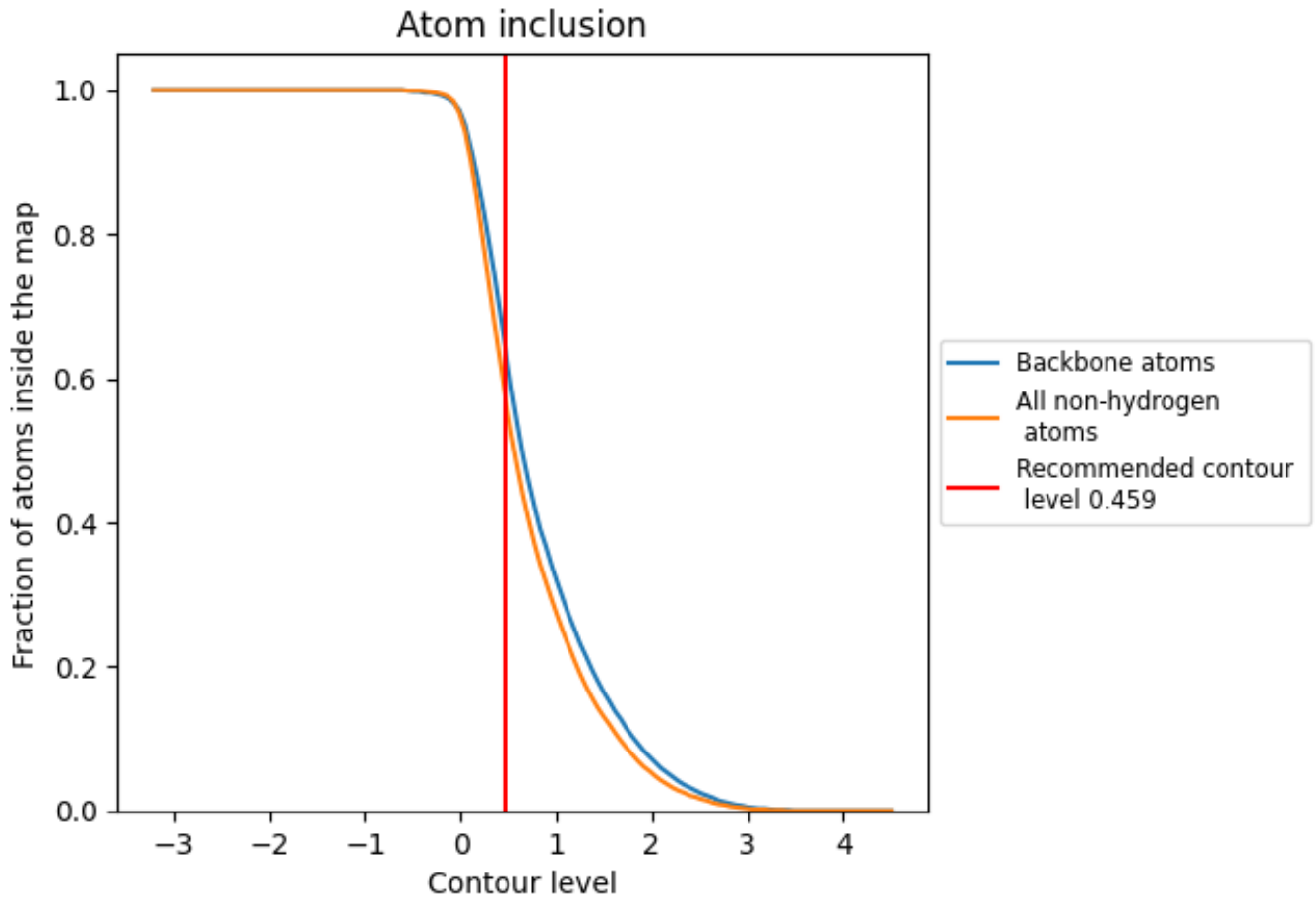
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.459).

9.4 Atom inclusion (i)



At the recommended contour level, 65% of all backbone atoms, 58% 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 (0.459) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5810	0.3900
A	0.5990	0.4240
B	0.7150	0.4430
C	0.5760	0.3610
D	0.1990	0.2750