Full wwPDB EM Validation Report

Nov 19, 2026 – 03:03 PM EST

PDB ID	:	9ZRH / pdb_00009zrh
EMDB ID	:	EMD-74616
Title	:	Cryo-EM Structure of the open tail complex of Vibrio Phage Peru-2
Authors	:	Yu, H.; Zhao, J.; Robins, W.P.; Liu, J.
Deposited on	:	2025-12-19
Resolution	:	3.92 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

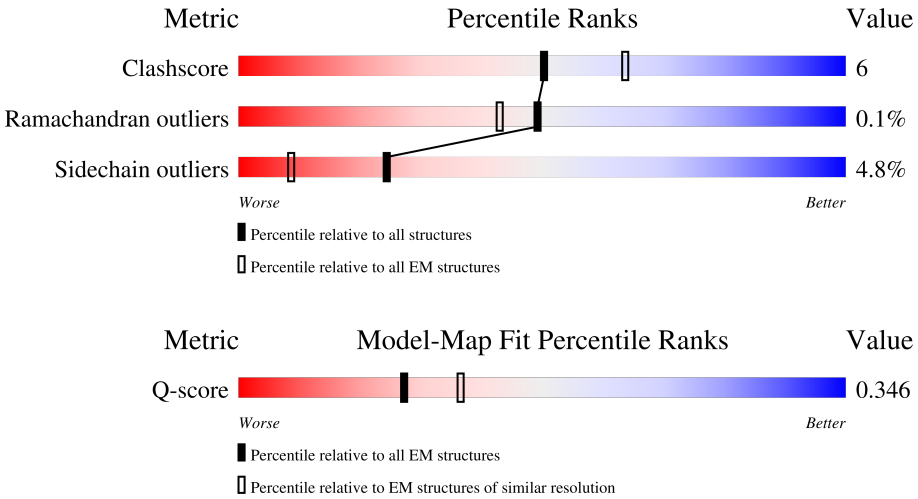
EMDB validation analysis	:	0.0.1.dev133
MolProbity	:	4-5-2 with Phenix2.2
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 3.92 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.



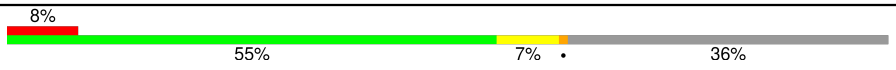
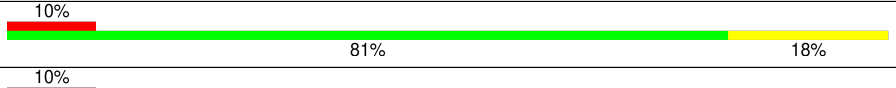
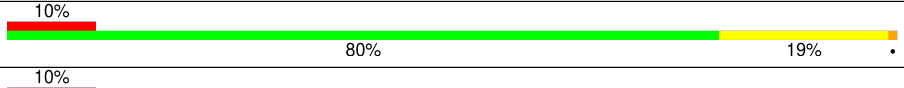
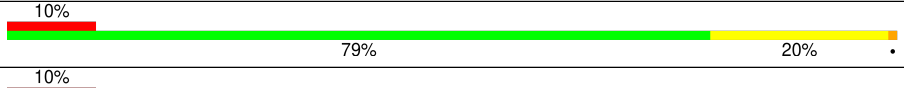
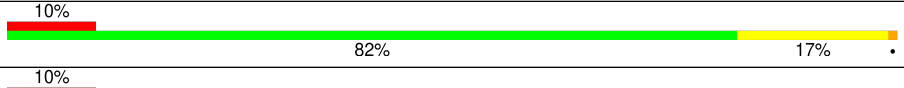
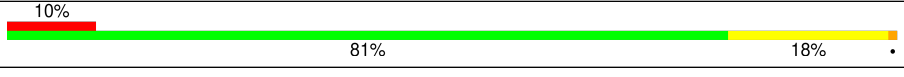
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	7862 (3.42 - 4.42)

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	179	11% 59% 5% 36%
1	B	179	11% 62% • 36%
1	C	179	13% 59% 5% 36%
1	D	179	8% 59% • • 36%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	E	179	
1	F	179	
2	G	811	
2	H	811	
2	I	811	
2	J	811	
2	K	811	
2	L	811	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 43602 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 Internal core p2_38 protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	114	Total	C	N	O	S	0	0
			854	512	152	184	6		
1	B	114	Total	C	N	O	S	0	0
			854	512	152	184	6		
1	C	114	Total	C	N	O	S	0	0
			854	512	152	184	6		
1	D	114	Total	C	N	O	S	0	0
			854	512	152	184	6		
1	E	114	Total	C	N	O	S	0	0
			854	512	152	184	6		
1	F	114	Total	C	N	O	S	0	0
			854	512	152	184	6		

- Molecule 2 is a protein called Tail knob p2_36 protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	G	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		
2	H	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		
2	I	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		
2	J	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		
2	K	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		
2	L	811	Total	C	N	O	S	0	0
			6413	4040	1117	1233	23		

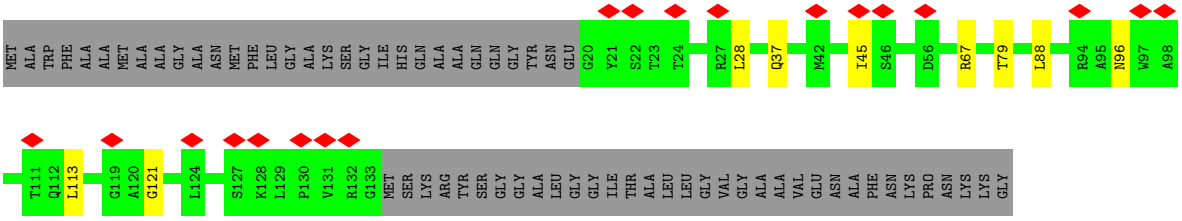
3 Residue-property plots (i)

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: Internal core p2_38 protein

Chain A:

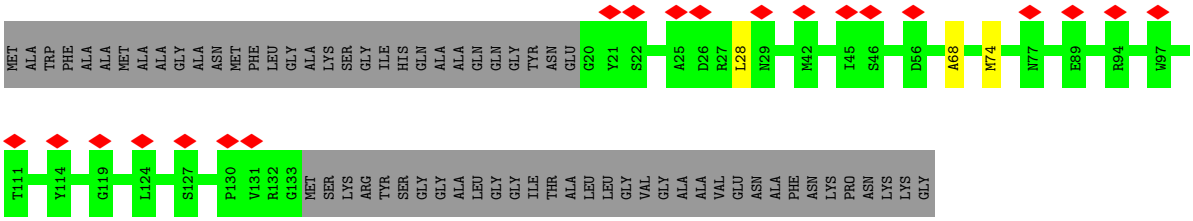




• Molecule 1: Internal core p2_38 protein

Chain B:

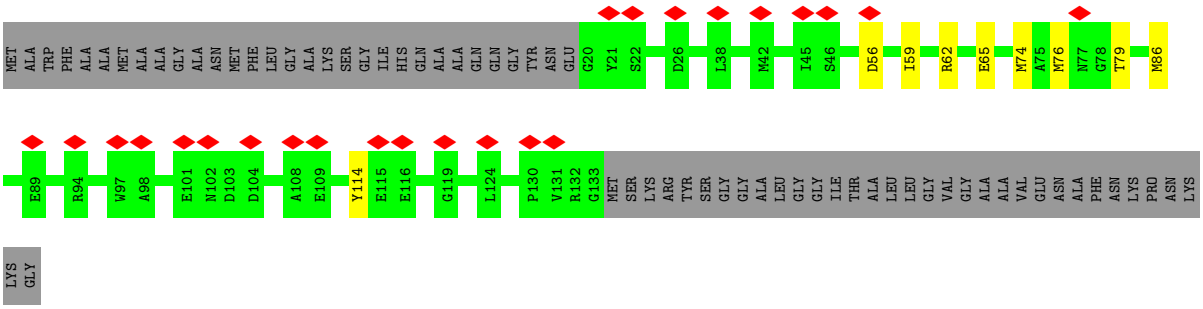




• Molecule 1: Internal core p2_38 protein

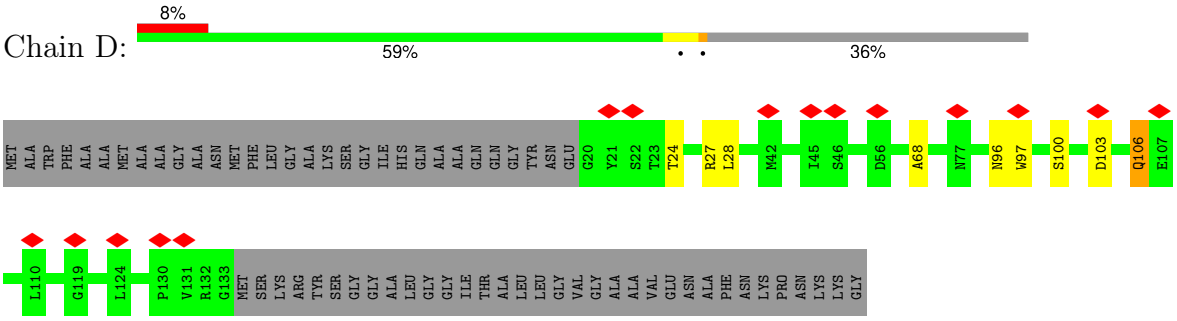
Chain C:





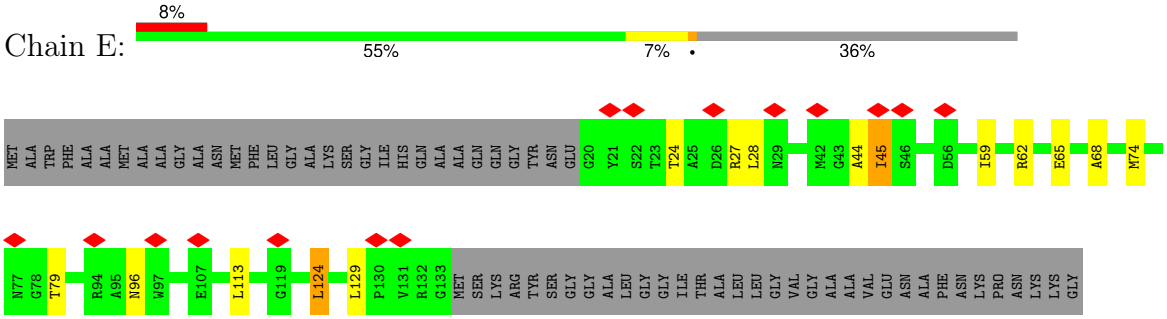
• Molecule 1: Internal core p2_38 protein

Chain D:



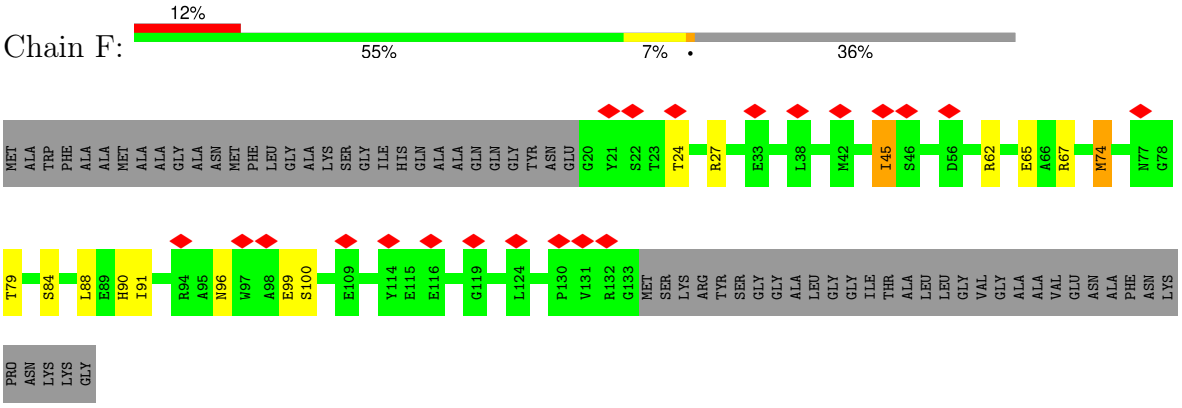
• Molecule 1: Internal core p2_38 protein

Chain E:



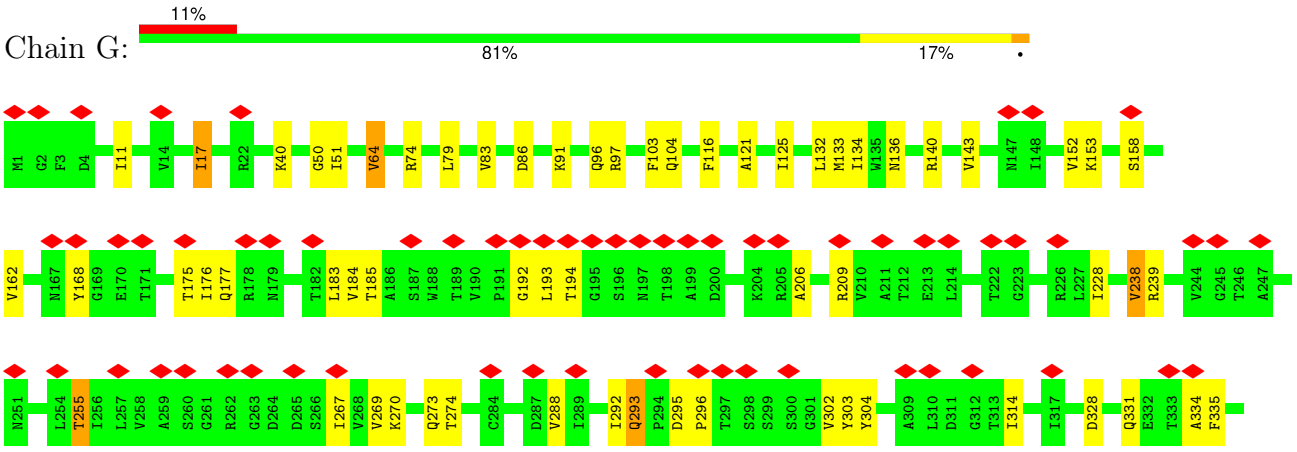
• Molecule 1: Internal core p2_38 protein

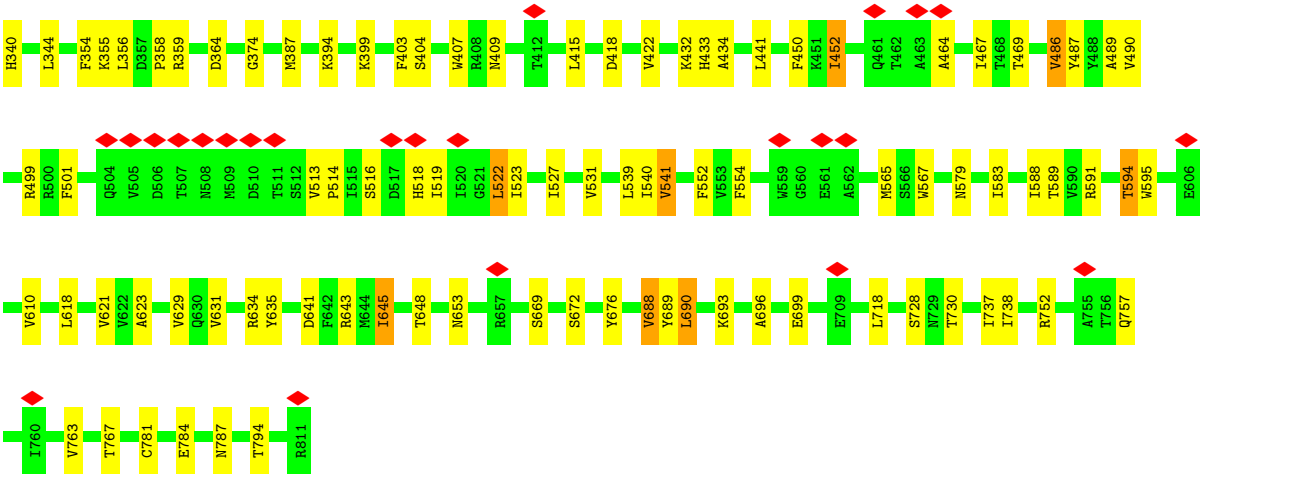
Chain F:



• Molecule 2: Tail knob p2_36 protein

Chain G:

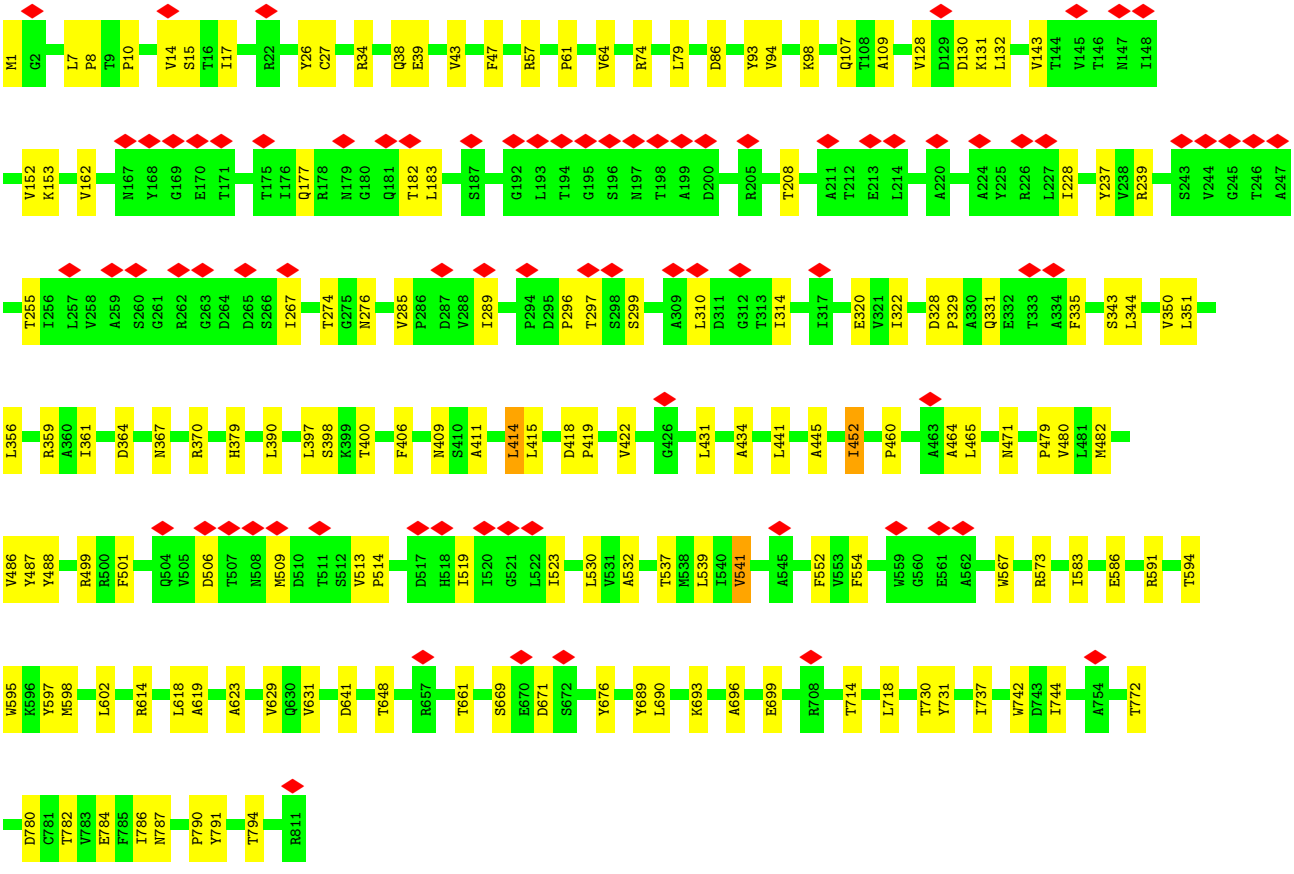




• Molecule 2: Tail knob p2_36 protein

Chain H:

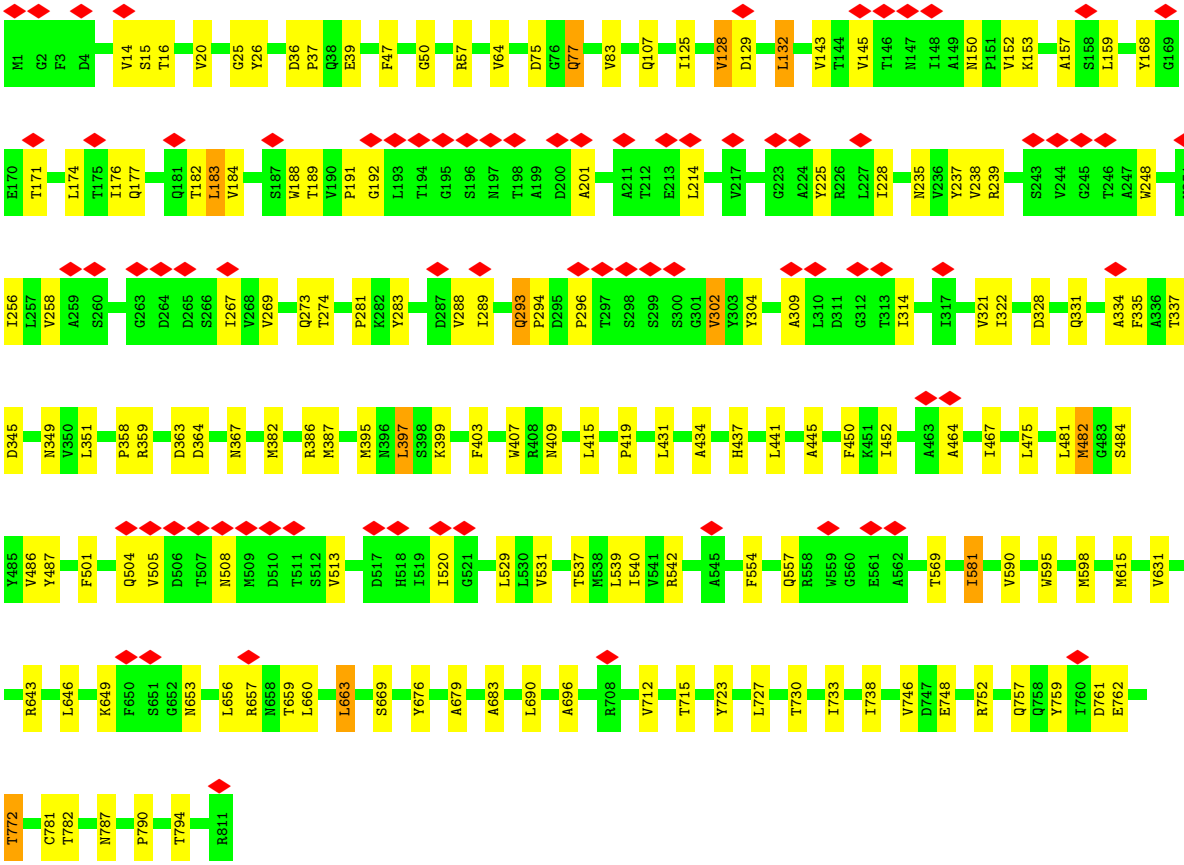




• Molecule 2: Tail knob p2_36 protein

Chain I:

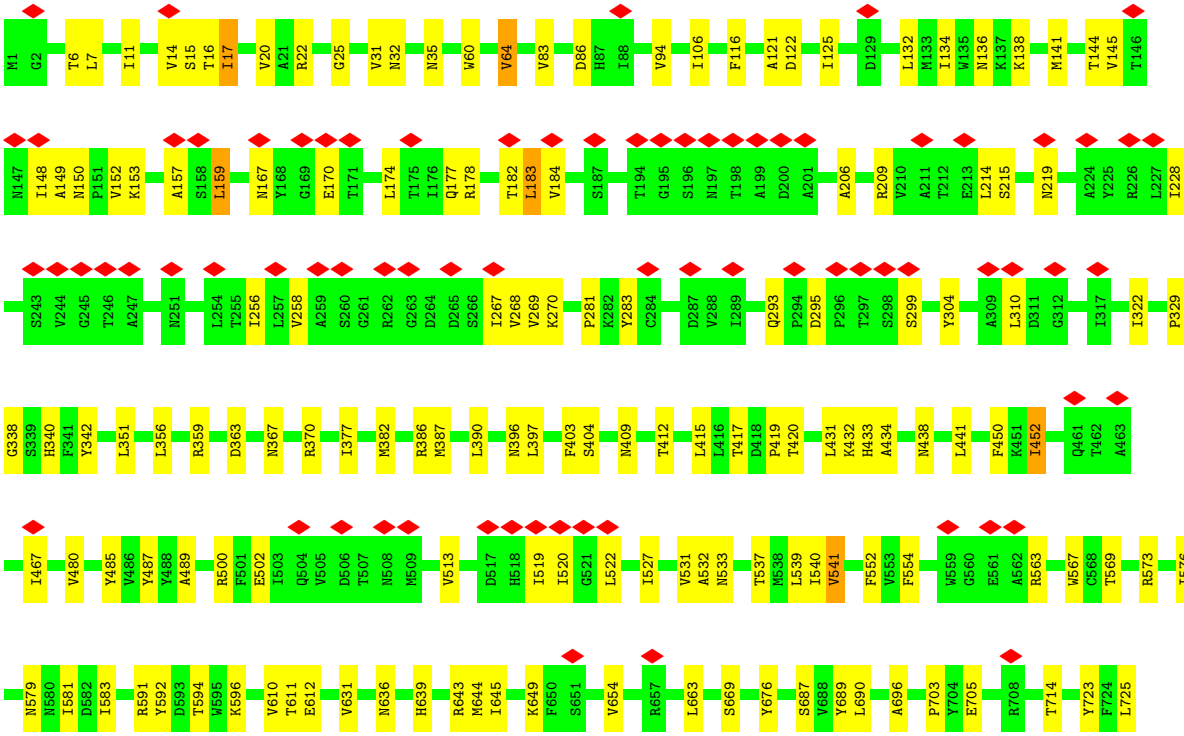


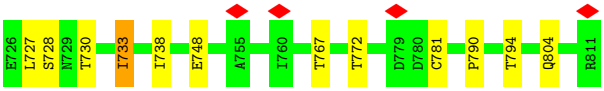


• Molecule 2: Tail knob p2_36 protein

Chain J:



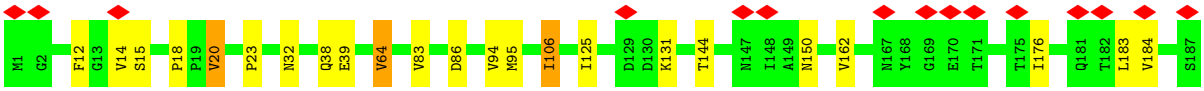


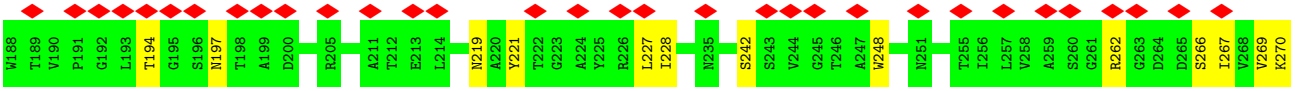


• Molecule 2: Tail knob p2_36 protein

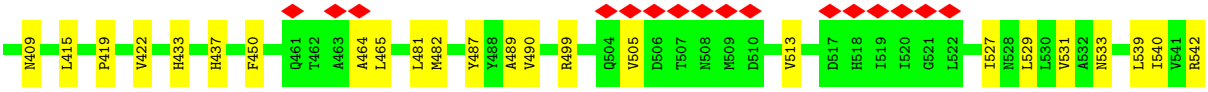
Chain K:

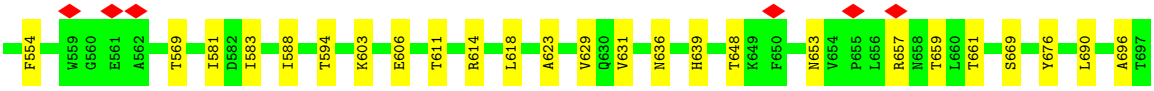


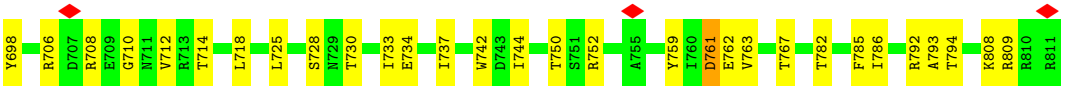










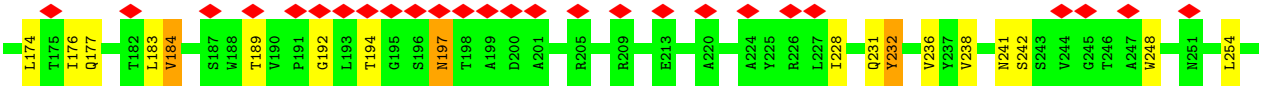


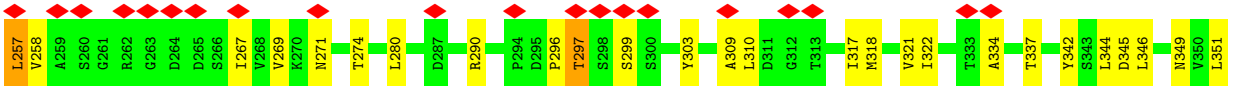
• Molecule 2: Tail knob p2_36 protein

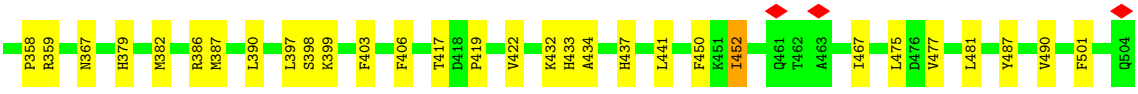
Chain L:

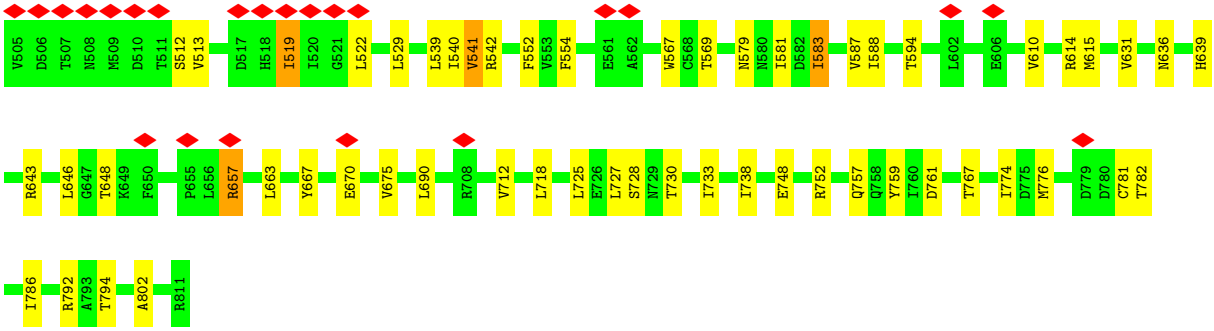











V505 D506 T507 N508 M509 D510 T511 S512 V513 D517 H518 I519 I520 G521 L522 L529 L539 I540 V541 R542 F552 V553 F554 E561 A562 W567 C568 T569 N579 N580 I581 D582 I583 V587 I588 T594 L602 E606 V610 R614 M615 V631 N636 H639
R643 L646 G647 T648 K649 F650 P655 L656 R657 L663 Y667 E670 V675 L690 R708 V712 L718 L725 E726 L727 S728 M729 T730 I733 I738 E748 R752 Q757 Q758 Y759 T760 D761 T767 I774 D775 M776 D779 D780 C781 T782
I786 R792 A793 T794 A802 R811

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	4452	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.963	Depositor
Minimum map value	-0.624	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.033	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	478.464, 478.464, 478.464	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.068, 1.068, 1.068	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	0.13	0/861	0.33	0/1161
1	B	0.14	0/861	0.35	0/1161
1	C	0.15	0/861	0.33	0/1161
1	D	0.13	0/861	0.35	0/1161
1	E	0.15	0/861	0.37	0/1161
1	F	0.15	0/861	0.31	0/1161
2	G	0.20	0/6563	0.44	0/8940
2	H	0.20	0/6563	0.44	0/8940
2	I	0.20	0/6563	0.44	1/8940 (0.0%)
2	J	0.19	0/6563	0.41	0/8940
2	K	0.19	0/6563	0.42	1/8940 (0.0%)
2	L	0.19	0/6563	0.44	1/8940 (0.0%)
All	All	0.19	0/44544	0.42	3/60606 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	K	657	ARG	N-CA-C	-5.86	107.12	114.56
2	I	657	ARG	N-CA-C	-5.80	106.83	114.31
2	L	657	ARG	N-CA-C	-5.58	106.29	114.39

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	854	0	812	3	0
1	B	854	0	812	1	0
1	C	854	0	812	5	0
1	D	854	0	812	6	0
1	E	854	0	812	11	0
1	F	854	0	812	11	0
2	G	6413	0	6256	79	0
2	H	6413	0	6256	76	0
2	I	6413	0	6256	83	0
2	J	6413	0	6256	81	0
2	K	6413	0	6256	69	0
2	L	6413	0	6256	76	0
All	All	43602	0	42408	479	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 6.

All (479) 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)
2:J:157:ALA:HA	2:J:238:VAL:O	1.63	0.96
2:L:2:GLY:HA2	2:L:802:ALA:O	1.76	0.85
2:L:397:LEU:O	2:L:419:PRO:HA	1.81	0.81
2:G:669:SER:HB2	2:G:676:TYR:HB2	1.69	0.74
1:E:96:ASN:HB3	2:G:296:PRO:HD2	1.70	0.72
2:H:539:LEU:HB2	2:H:554:PHE:HB3	1.71	0.72
2:L:539:LEU:HB2	2:L:554:PHE:HB3	1.73	0.70
2:I:50:GLY:HA2	2:I:634:ARG:HH22	1.58	0.68
2:I:669:SER:HB2	2:I:676:TYR:HB2	1.76	0.68
2:K:194:THR:H	2:K:197:ASN:HD21	1.42	0.67
2:I:539:LEU:HB2	2:I:554:PHE:HB3	1.77	0.66
2:K:183:LEU:HG	2:K:184:VAL:HG23	1.77	0.65
2:I:152:VAL:HG13	2:I:153:LYS:HG3	1.77	0.65
2:K:387:MET:HE3	2:K:403:PHE:HB3	1.79	0.65
2:H:669:SER:HB2	2:H:676:TYR:HB2	1.79	0.65
2:G:387:MET:HE3	2:G:403:PHE:HB3	1.78	0.64
2:L:299:SER:HB3	2:L:303:TYR:HE1	1.62	0.64
2:I:441:LEU:HD23	2:I:452:ILE:HD12	1.79	0.64
2:H:586:GLU:HG3	2:H:602:LEU:HB2	1.79	0.64
2:I:738:ILE:O	2:I:781:CYS:HA	1.97	0.64
2:I:304:TYR:HE2	2:I:363:ASP:HB3	1.63	0.64
2:I:143:VAL:HG12	2:I:335:PHE:HA	1.81	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:37:GLN:HE22	1:A:121:GLY:HA2	1.63	0.63
2:G:64:VAL:HA	2:G:86:ASP:HB3	1.80	0.63
2:L:614:ARG:HH21	2:L:792:ARG:HD2	1.63	0.63
2:L:387:MET:HB2	2:L:403:PHE:HB3	1.79	0.63
2:L:168:TYR:HB3	2:L:192:GLY:HA2	1.79	0.63
2:L:345:ASP:O	2:L:349:ASN:HA	1.98	0.63
2:G:50:GLY:HA2	2:G:634:ARG:HH22	1.64	0.62
2:H:359:ARG:HE	2:H:367:ASN:HD21	1.47	0.62
2:J:387:MET:HE3	2:J:403:PHE:HB3	1.80	0.62
2:K:669:SER:HB2	2:K:676:TYR:HB2	1.81	0.62
1:F:90:HIS:HB2	2:H:414:LEU:HD21	1.82	0.62
2:G:74:ARG:HD3	2:G:79:LEU:HD13	1.82	0.62
2:I:176:ILE:HB	2:I:184:VAL:HB	1.82	0.61
2:J:293:GLN:HG2	2:J:295:ASP:H	1.65	0.61
2:L:334:ALA:HA	2:L:358:PRO:HB3	1.81	0.61
2:G:539:LEU:HB2	2:G:554:PHE:HB3	1.81	0.61
2:I:294:PRO:HD3	2:I:302:VAL:HB	1.83	0.61
2:K:397:LEU:O	2:K:419:PRO:HA	2.00	0.61
2:H:397:LEU:O	2:H:419:PRO:HA	2.01	0.61
2:H:143:VAL:HG12	2:H:335:PHE:HA	1.81	0.61
2:J:519:ILE:HD12	2:J:522:LEU:HB3	1.83	0.60
2:L:231:GLN:HG2	2:L:236:VAL:HG22	1.82	0.60
2:L:614:ARG:HE	2:L:792:ARG:HG3	1.64	0.60
2:J:730:THR:HG22	2:J:794:THR:H	1.66	0.60
2:G:399:LYS:HZ3	2:G:418:ASP:HA	1.66	0.60
2:H:310:LEU:HD13	2:H:320:GLU:HG2	1.84	0.60
2:L:171:THR:HG22	2:L:189:THR:HG22	1.84	0.60
2:J:397:LEU:O	2:J:419:PRO:HA	2.01	0.60
2:L:615:MET:HE1	2:L:643:ARG:HB2	1.82	0.60
2:H:541:VAL:HG22	2:H:552:PHE:HB2	1.84	0.59
2:K:262:ARG:HE	2:K:266:SER:HA	1.66	0.59
2:I:386:ARG:HD3	2:I:397:LEU:HB3	1.84	0.59
2:I:387:MET:HB2	2:I:403:PHE:HB3	1.84	0.59
2:L:156:GLN:HE22	2:L:248:TRP:HB3	1.67	0.59
2:K:162:VAL:HG13	2:K:267:ILE:HG22	1.85	0.59
2:J:121:ALA:HB3	2:J:136:ASN:HD21	1.68	0.59
2:H:276:ASN:HA	2:H:297:THR:HG21	1.83	0.59
2:G:143:VAL:HG12	2:G:335:PHE:HA	1.85	0.59
2:G:177:GLN:HB2	2:G:255:THR:HG23	1.84	0.59
2:I:409:ASN:HB3	2:I:415:LEU:HD13	1.84	0.59
2:H:152:VAL:HG13	2:H:153:LYS:HG2	1.85	0.58

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:645:ILE:HG23	2:G:689:TYR:HB2	1.84	0.58
2:I:107:GLN:HB3	2:I:351:LEU:HD22	1.86	0.58
2:J:7:LEU:HD21	2:J:703:PRO:HB3	1.85	0.58
2:K:83:VAL:HG12	2:K:94:VAL:HG22	1.86	0.58
2:L:83:VAL:HG22	2:L:94:VAL:HG22	1.84	0.58
2:J:11:ILE:HG22	2:J:35:ASN:HB2	1.85	0.58
2:G:175:THR:HG22	2:G:185:THR:HG22	1.84	0.58
2:J:409:ASN:HB3	2:J:415:LEU:HD13	1.84	0.58
2:J:539:LEU:HB2	2:J:554:PHE:HB3	1.84	0.57
2:J:643:ARG:HD3	2:J:790:PRO:HG3	1.86	0.57
2:J:167:ASN:HB3	2:J:170:GLU:HG3	1.86	0.57
2:J:541:VAL:HG22	2:J:552:PHE:HB2	1.84	0.57
2:G:728:SER:HA	2:G:767:THR:HA	1.86	0.57
2:H:693:LYS:HE2	2:H:790:PRO:HD3	1.86	0.57
2:G:594:THR:HG1	2:G:595:TRP:CD1	2.23	0.57
2:H:57:ARG:HB2	2:H:597:TYR:HE2	1.69	0.57
2:I:128:VAL:HG23	2:I:382:MET:HB2	1.86	0.57
2:L:583:ILE:HG22	2:L:588:ILE:HG12	1.87	0.57
2:G:541:VAL:HG22	2:G:552:PHE:HB2	1.85	0.56
2:H:132:LEU:HB2	2:H:344:LEU:HB3	1.85	0.56
2:G:516:SER:HA	2:G:522:LEU:HD12	1.86	0.56
2:I:237:TYR:HE2	2:I:239:ARG:HD3	1.69	0.56
2:J:434:ALA:HB1	2:J:441:LEU:HD11	1.86	0.56
2:G:523:ILE:HG21	2:G:527:ILE:HG12	1.86	0.56
2:I:132:LEU:HG	2:I:344:LEU:HB3	1.86	0.56
2:I:176:ILE:HG13	2:I:256:ILE:HG12	1.86	0.56
2:K:95:MET:HE3	2:K:106:ILE:HB	1.87	0.56
2:J:17:ILE:HG21	2:K:39:GLU:HA	1.88	0.56
2:K:734:GLU:HB2	2:K:786:ILE:HG23	1.88	0.56
2:H:57:ARG:HB3	2:H:595:TRP:HB3	1.87	0.56
2:J:645:ILE:HG23	2:J:689:TYR:HB2	1.88	0.56
2:H:441:LEU:HB3	2:H:452:ILE:HG13	1.89	0.55
2:I:75:ASP:HB3	2:I:77:GLN:HE22	1.70	0.55
2:I:723:TYR:HB2	2:I:772:THR:HG23	1.89	0.55
2:K:64:VAL:HA	2:K:86:ASP:HB3	1.89	0.55
2:L:299:SER:HB3	2:L:303:TYR:CE1	2.40	0.55
2:I:434:ALA:HB1	2:I:441:LEU:HD11	1.89	0.55
2:G:490:VAL:HG21	2:G:499:ARG:HE	1.72	0.55
2:K:310:LEU:HD11	2:K:320:GLU:HB2	1.88	0.55
2:I:191:PRO:HB2	2:I:201:ALA:HB2	1.88	0.55
2:L:441:LEU:HB3	2:L:452:ILE:HG13	1.89	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:96:ASN:HB3	2:L:296:PRO:HD2	1.88	0.55
2:L:232:TYR:HB2	2:L:318:MET:HE3	1.89	0.55
2:H:17:ILE:HG21	2:I:39:GLU:HA	1.88	0.54
2:J:159:LEU:HD13	2:J:281:PRO:HG2	1.89	0.54
1:E:129:LEU:HA	2:G:194:THR:HA	1.90	0.54
2:J:441:LEU:HB3	2:J:452:ILE:HG13	1.88	0.54
2:I:581:ILE:HB	2:I:590:VAL:HG13	1.89	0.54
2:G:152:VAL:HG13	2:G:153:LYS:HG3	1.89	0.54
2:H:730:THR:HG22	2:H:794:THR:H	1.71	0.54
2:I:508:ASN:HD22	2:J:438:ASN:HD21	1.54	0.54
2:G:168:TYR:HB3	2:G:192:GLY:HA2	1.90	0.54
2:H:328:ASP:HB3	2:H:331:GLN:HB3	1.89	0.54
2:L:529:LEU:HD21	2:L:581:ILE:HG22	1.88	0.54
2:G:409:ASN:HB3	2:G:415:LEU:HD13	1.89	0.54
2:G:583:ILE:HG12	2:G:588:ILE:HG12	1.89	0.54
2:L:434:ALA:HB1	2:L:441:LEU:HD11	1.90	0.54
2:L:437:HIS:HD2	2:L:481:LEU:HD11	1.73	0.54
2:H:409:ASN:HB3	2:H:415:LEU:HD13	1.90	0.53
2:G:162:VAL:HG13	2:G:267:ILE:HG22	1.89	0.53
2:I:168:TYR:HB3	2:I:192:GLY:HA2	1.90	0.53
2:J:150:ASN:HD21	2:J:153:LYS:HB2	1.73	0.53
2:J:728:SER:HA	2:J:767:THR:HA	1.90	0.53
2:K:659:THR:HG22	2:K:761:ASP:HB2	1.90	0.53
2:L:541:VAL:HG22	2:L:552:PHE:HB2	1.88	0.53
2:G:153:LYS:HB3	2:G:288:VAL:HG12	1.90	0.53
2:I:128:VAL:HG13	2:I:129:ASP:H	1.73	0.53
2:J:738:ILE:O	2:J:781:CYS:HA	2.07	0.53
2:K:539:LEU:HB2	2:K:554:PHE:HB3	1.90	0.53
1:F:99:GLU:HB3	2:H:296:PRO:HB3	1.90	0.53
2:I:663:LEU:HD22	2:I:679:ALA:HB1	1.91	0.53
2:L:228:ILE:HG13	2:L:241:ASN:HD22	1.73	0.53
2:L:631:VAL:HG13	2:L:690:LEU:HD13	1.90	0.53
2:G:579:ASN:HB2	2:G:591:ARG:HD3	1.89	0.53
2:I:150:ASN:HD21	2:I:153:LYS:HB2	1.73	0.53
2:I:397:LEU:O	2:I:419:PRO:HA	2.08	0.53
2:I:153:LYS:HB3	2:I:288:VAL:HG12	1.90	0.53
2:I:656:LEU:HB2	2:I:660:LEU:HD21	1.90	0.53
2:K:14:VAL:HG22	2:K:23:PRO:HG2	1.91	0.52
2:L:519:ILE:HD12	2:L:522:LEU:HB3	1.91	0.52
2:I:235:ASN:ND2	2:I:283:TYR:H	2.07	0.52
2:L:540:ILE:HG21	2:L:581:ILE:HD13	1.91	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:129:LEU:HD13	2:G:193:LEU:HB3	1.90	0.52
2:H:107:GLN:HB3	2:H:351:LEU:HD22	1.91	0.52
2:H:398:SER:HA	2:H:419:PRO:HB3	1.91	0.52
2:K:450:PHE:HB3	2:K:465:LEU:HB3	1.90	0.52
2:K:529:LEU:HB3	2:K:542:ARG:HB2	1.91	0.52
2:K:706:ARG:HD3	2:K:710:GLY:HA2	1.91	0.52
2:L:752:ARG:HA	2:L:757:GLN:HE22	1.73	0.52
2:H:499:ARG:HG2	2:H:514:PRO:HB3	1.91	0.52
2:I:631:VAL:HG13	2:I:690:LEU:HD13	1.90	0.52
2:K:270:LYS:HD2	2:K:274:THR:HG23	1.91	0.52
2:G:730:THR:HG22	2:G:794:THR:H	1.74	0.52
2:K:409:ASN:HB3	2:K:415:LEU:HD13	1.92	0.52
2:L:646:LEU:HB2	2:L:663:LEU:HD11	1.90	0.52
2:L:730:THR:HG22	2:L:794:THR:H	1.75	0.52
2:I:37:PRO:HD3	2:I:557:GLN:HG2	1.92	0.52
2:G:486:VAL:HG23	2:G:501:PHE:HB3	1.91	0.51
2:J:487:TYR:CG	2:J:539:LEU:HD11	2.45	0.51
2:K:531:VAL:HG12	2:K:540:ILE:HB	1.91	0.51
2:G:487:TYR:CG	2:G:539:LEU:HD11	2.46	0.51
2:H:361:ILE:HG23	2:H:411:ALA:HB2	1.92	0.51
2:J:31:VAL:HG12	2:J:569:THR:HB	1.92	0.51
2:J:152:VAL:HG13	2:J:153:LYS:HG3	1.92	0.51
1:E:45:ILE:HD13	1:E:113:LEU:HD13	1.91	0.51
2:I:345:ASP:O	2:I:349:ASN:HA	2.10	0.51
2:J:60:TRP:CD1	2:J:64:VAL:HG11	2.44	0.51
1:C:86:MET:HE3	2:K:368:PRO:HD3	1.93	0.51
2:L:379:HIS:HB3	2:L:390:LEU:HB2	1.93	0.51
2:H:434:ALA:HB1	2:H:441:LEU:HD11	1.93	0.51
2:I:47:PHE:HB3	2:I:598:MET:HG2	1.91	0.51
2:J:500:ARG:HH22	2:J:563:ARG:HH12	1.58	0.51
2:I:450:PHE:HD1	2:I:467:ILE:HA	1.76	0.51
2:H:162:VAL:HG22	2:H:267:ILE:HD12	1.93	0.50
2:I:659:THR:HG22	2:I:761:ASP:HB2	1.92	0.50
2:L:487:TYR:CG	2:L:539:LEU:HD11	2.46	0.50
1:D:68:ALA:HB2	2:G:415:LEU:HD23	1.92	0.50
2:I:531:VAL:HG12	2:I:540:ILE:HB	1.92	0.50
2:L:53:GLY:HA3	2:L:100:PHE:HD1	1.76	0.50
2:K:176:ILE:HB	2:K:184:VAL:HB	1.92	0.50
2:K:338:GLY:HA2	2:K:340:HIS:CE1	2.47	0.50
2:K:742:TRP:HE3	2:K:744:ILE:HD11	1.76	0.50
2:L:177:GLN:HG3	2:L:257:LEU:HD23	1.94	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:273:GLN:HG3	2:I:293:GLN:HG2	1.93	0.50
2:K:221:TYR:HB3	2:K:227:LEU:HD21	1.92	0.50
2:I:504:GLN:HG3	2:I:505:VAL:HG23	1.94	0.50
2:H:359:ARG:HH22	2:H:364:ASP:HA	1.77	0.50
2:I:696:ALA:HB3	2:I:787:ASN:HB3	1.94	0.50
2:K:242:SER:HG	2:K:248:TRP:CD1	2.30	0.50
2:H:482:MET:HE2	2:H:532:ALA:HB1	1.93	0.49
2:J:611:THR:HG23	2:J:612:GLU:HG2	1.94	0.49
1:D:24:THR:HA	1:D:27:ARG:HD3	1.94	0.49
2:L:359:ARG:HH21	2:L:367:ASN:HD21	1.59	0.49
2:J:22:ARG:HB3	2:J:520:ILE:H	1.76	0.49
2:K:83:VAL:HG21	2:K:125:ILE:HD11	1.94	0.49
2:K:487:TYR:CG	2:K:539:LEU:HD11	2.46	0.49
2:K:750:THR:HG22	2:K:752:ARG:H	1.77	0.49
2:G:270:LYS:HD2	2:G:274:THR:HG23	1.95	0.49
2:I:258:VAL:HG11	2:I:267:ILE:HB	1.94	0.49
2:J:386:ARG:HH22	2:J:417:THR:HA	1.77	0.49
2:G:273:GLN:HB3	2:G:293:GLN:HG3	1.95	0.49
2:I:293:GLN:HG3	2:I:294:PRO:HD2	1.95	0.49
2:J:356:LEU:HD12	2:J:404:SER:HA	1.94	0.49
2:I:159:LEU:HB3	2:I:281:PRO:HG2	1.93	0.49
2:L:501:PHE:HD1	2:L:512:SER:HB2	1.78	0.49
1:D:97:TRP:HE1	2:L:299:SER:C	2.21	0.49
2:I:615:MET:HG2	2:I:790:PRO:HB2	1.95	0.49
2:I:615:MET:HE1	2:I:643:ARG:HB2	1.95	0.49
2:H:631:VAL:HG13	2:H:690:LEU:HD13	1.94	0.48
2:J:183:LEU:HG	2:J:184:VAL:HG23	1.95	0.48
2:I:177:GLN:HG2	2:I:255:THR:HB	1.95	0.48
2:G:450:PHE:HE1	2:G:467:ILE:HG12	1.78	0.48
1:A:79:THR:HG23	2:I:464:ALA:HB2	1.94	0.48
2:J:533:ASN:HB2	2:J:583:ILE:HG21	1.96	0.48
2:G:518:HIS:CD2	2:G:519:ILE:HG12	2.49	0.48
2:I:157:ALA:HA	2:I:238:VAL:O	2.13	0.48
2:L:667:TYR:CE1	2:L:670:GLU:HB2	2.48	0.48
2:H:289:ILE:HD12	2:H:329:PRO:HG3	1.96	0.48
2:J:178:ARG:HB2	2:J:183:LEU:HD22	1.96	0.48
2:J:299:SER:HA	2:J:412:THR:HA	1.95	0.48
2:K:338:GLY:HA2	2:K:340:HIS:HE1	1.78	0.48
2:G:648:THR:HB	2:G:653:ASN:HA	1.96	0.48
2:G:531:VAL:HG12	2:G:540:ILE:HB	1.95	0.47
2:H:488:TYR:HE1	2:H:501:PHE:HB2	1.79	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:482:MET:HE2	2:I:539:LEU:HG	1.95	0.47
2:J:359:ARG:HD2	2:J:367:ASN:HD21	1.79	0.47
2:I:15:SER:HB2	2:I:26:TYR:HE1	1.79	0.47
2:I:437:HIS:HD2	2:I:481:LEU:HD11	1.78	0.47
2:I:730:THR:HG22	2:I:794:THR:H	1.79	0.47
2:J:238:VAL:HG11	2:J:256:ILE:HD11	1.95	0.47
2:I:171:THR:HG22	2:I:189:THR:HA	1.96	0.47
2:L:132:LEU:HD23	2:L:346:LEU:HD21	1.95	0.47
1:C:79:THR:HG23	2:K:464:ALA:HB2	1.97	0.47
1:E:68:ALA:HB2	2:H:415:LEU:HD23	1.96	0.47
2:I:486:VAL:HG23	2:I:501:PHE:HB3	1.96	0.47
2:H:131:LYS:HE3	2:H:343:SER:HB2	1.97	0.47
2:G:752:ARG:HA	2:G:757:GLN:HE22	1.80	0.47
2:J:342:TYR:HB3	2:J:351:LEU:HD11	1.97	0.47
2:I:328:ASP:HB3	2:I:331:GLN:HB3	1.97	0.47
2:J:149:ALA:HA	2:J:329:PRO:HB2	1.96	0.47
1:F:67:ARG:HG3	1:F:88:LEU:HD22	1.96	0.47
2:I:183:LEU:HG	2:I:184:VAL:HG23	1.97	0.47
2:J:141:MET:HE1	2:J:377:ILE:HB	1.97	0.47
2:J:338:GLY:HA2	2:J:340:HIS:CE1	2.50	0.47
2:J:235:ASN:ND2	2:J:283:TYR:H	2.13	0.46
2:G:328:ASP:HB3	2:G:331:GLN:HB3	1.97	0.46
2:J:370:ARG:HH22	2:J:420:THR:C	2.22	0.46
2:K:606:GLU:HB2	2:K:611:THR:HG22	1.96	0.46
2:L:242:SER:HG	2:L:248:TRP:CD1	2.32	0.46
2:L:398:SER:HB3	2:L:406:PHE:CZ	2.50	0.46
2:G:228:ILE:HG23	2:G:239:ARG:HG3	1.96	0.46
2:I:487:TYR:CG	2:I:539:LEU:HD11	2.50	0.46
2:J:157:ALA:CA	2:J:238:VAL:O	2.50	0.46
2:J:649:LYS:HB2	2:J:687:SER:HB3	1.96	0.46
2:K:614:ARG:HE	2:K:792:ARG:HB2	1.79	0.46
2:K:631:VAL:HG13	2:K:690:LEU:HD13	1.96	0.46
2:L:738:ILE:O	2:L:781:CYS:HA	2.16	0.46
2:K:490:VAL:HG21	2:K:499:ARG:HH21	1.81	0.46
2:J:480:VAL:HG11	2:J:532:ALA:HB2	1.96	0.46
2:H:431:LEU:HD23	2:H:445:ALA:HB2	1.97	0.46
2:J:727:LEU:HD21	2:J:733:ILE:HG21	1.97	0.46
2:L:194:THR:HG22	2:L:197:ASN:HD21	1.81	0.46
2:L:437:HIS:CD2	2:L:481:LEU:HD11	2.50	0.46
2:G:292:ILE:HG13	2:G:303:TYR:CE1	2.50	0.46
2:H:487:TYR:CG	2:H:539:LEU:HD11	2.51	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:623:ALA:HB2	2:H:629:VAL:HG12	1.98	0.46
2:L:667:TYR:HE1	2:L:670:GLU:HB2	1.80	0.46
2:J:631:VAL:HG13	2:J:690:LEU:HD13	1.98	0.46
2:K:328:ASP:HB3	2:K:331:GLN:HB3	1.98	0.46
2:H:74:ARG:HH12	2:H:130:ASP:HA	1.81	0.46
2:I:57:ARG:HB2	2:I:595:TRP:HB3	1.97	0.46
2:K:273:GLN:HB2	2:K:293:GLN:HB3	1.97	0.46
2:G:176:ILE:HB	2:G:184:VAL:HG12	1.98	0.45
2:L:342:TYR:HB3	2:L:351:LEU:HD11	1.98	0.45
2:G:206:ALA:HB3	2:G:209:ARG:HB3	1.98	0.45
2:G:441:LEU:HB3	2:G:452:ILE:HG13	1.99	0.45
2:I:132:LEU:HD11	2:I:344:LEU:HD23	1.98	0.45
2:I:529:LEU:HB3	2:I:542:ARG:HB2	1.96	0.45
2:K:262:ARG:HH21	2:K:266:SER:HA	1.82	0.45
2:K:433:HIS:CD2	2:K:433:HIS:H	2.34	0.45
1:A:67:ARG:HG3	1:A:88:LEU:HD22	1.98	0.45
2:G:489:ALA:HB1	2:G:527:ILE:HD12	1.96	0.45
2:L:432:LYS:HB3	2:L:475:LEU:HD22	1.99	0.45
2:G:631:VAL:HG13	2:G:690:LEU:HD13	1.98	0.45
2:I:431:LEU:HD23	2:I:445:ALA:HB2	1.98	0.45
2:K:18:PRO:HG2	2:K:712:VAL:HB	1.97	0.45
2:H:641:ASP:HB3	2:H:693:LYS:H	1.82	0.45
2:I:395:MET:HE2	2:I:397:LEU:HD21	1.99	0.45
2:L:36:ASP:HB3	2:L:39:GLU:HB3	1.98	0.45
2:L:529:LEU:HB3	2:L:542:ARG:HB3	1.99	0.45
2:G:334:ALA:HA	2:G:358:PRO:HB3	1.97	0.45
2:J:32:ASN:HB2	2:J:696:ALA:HA	1.99	0.45
2:I:174:LEU:HD11	2:I:214:LEU:HD13	1.98	0.45
2:J:215:SER:O	2:J:219:ASN:HB2	2.17	0.45
2:K:708:ARG:HA	2:K:708:ARG:HD2	1.75	0.45
2:L:129:ASP:HB3	2:L:382:MET:HE2	1.98	0.45
2:H:370:ARG:HH12	2:H:419:PRO:HB2	1.82	0.45
2:H:699:GLU:HB2	2:H:784:GLU:HG2	1.98	0.45
2:J:174:LEU:HD11	2:J:214:LEU:HD13	1.99	0.45
2:J:177:GLN:HA	2:J:182:THR:HA	1.98	0.45
2:I:646:LEU:HD11	2:I:683:ALA:HB2	1.99	0.44
2:J:258:VAL:HG11	2:J:267:ILE:HB	1.98	0.44
1:F:79:THR:HG23	2:H:464:ALA:HB2	1.98	0.44
2:G:432:LYS:HG3	2:G:433:HIS:HD2	1.82	0.44
2:G:699:GLU:HB2	2:G:784:GLU:HG2	1.99	0.44
2:I:759:TYR:HB2	2:I:762:GLU:HG3	1.99	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:636:ASN:ND2	2:L:639:HIS:HB2	2.31	0.44
2:H:34:ARG:HE	2:H:34:ARG:HB3	1.61	0.44
2:H:61:PRO:HG2	2:H:93:TYR:CZ	2.53	0.44
2:K:342:TYR:HB3	2:K:351:LEU:HD11	1.99	0.44
2:K:359:ARG:HD2	2:K:367:ASN:HD21	1.82	0.44
2:H:7:LEU:HD12	2:H:8:PRO:HD2	1.99	0.44
2:L:728:SER:HA	2:L:767:THR:HA	1.98	0.44
2:G:621:VAL:HG23	2:G:688:VAL:HG13	1.98	0.44
2:H:43:VAL:HG13	2:H:614:ARG:HE	1.82	0.44
2:H:464:ALA:HB1	2:H:465:LEU:HD12	1.99	0.44
2:K:398:SER:HB3	2:K:406:PHE:CZ	2.51	0.44
2:G:304:TYR:CZ	2:G:328:ASP:HB2	2.53	0.44
2:I:649:LYS:HA	2:I:653:ASN:HA	1.98	0.44
2:I:727:LEU:HD23	2:I:730:THR:HG21	1.98	0.44
2:J:644:MET:HE3	2:J:663:LEU:HB2	1.99	0.44
1:F:96:ASN:HB3	2:H:299:SER:HA	1.99	0.44
2:G:340:HIS:HB3	2:G:355:LYS:HB3	1.99	0.44
2:G:554:PHE:HB2	2:G:567:TRP:CZ3	2.53	0.44
2:H:619:ALA:O	2:H:689:TYR:HA	2.17	0.44
2:G:618:LEU:HA	2:G:690:LEU:O	2.18	0.44
2:I:174:LEU:HD22	2:I:258:VAL:HG22	2.00	0.44
2:J:450:PHE:HE1	2:J:467:ILE:HG23	1.83	0.44
2:K:618:LEU:HA	2:K:690:LEU:O	2.18	0.44
2:K:730:THR:HG22	2:K:794:THR:H	1.82	0.44
1:C:62:ARG:HA	1:C:65:GLU:HG2	2.00	0.43
2:J:83:VAL:HG12	2:J:94:VAL:HG22	1.99	0.43
2:K:271:ASN:C	2:K:290:ARG:HH21	2.25	0.43
2:L:176:ILE:HD13	2:L:184:VAL:HG13	2.00	0.43
2:G:96:GLN:HE21	2:G:104:GLN:NE2	2.16	0.43
2:J:64:VAL:HA	2:J:86:ASP:HB3	2.00	0.43
1:B:68:ALA:HB2	2:K:415:LEU:HD23	2.00	0.43
2:G:121:ALA:HB3	2:G:136:ASN:HD21	1.83	0.43
2:G:738:ILE:O	2:G:781:CYS:HA	2.18	0.43
2:H:379:HIS:HB3	2:H:390:LEU:HD23	2.00	0.43
2:H:554:PHE:HB2	2:H:567:TRP:CZ3	2.54	0.43
2:K:437:HIS:HD2	2:K:481:LEU:HD11	1.83	0.43
2:K:759:TYR:HB2	2:K:762:GLU:HG3	2.00	0.43
2:L:60:TRP:CD1	2:L:64:VAL:HG11	2.53	0.43
1:E:79:THR:HG23	2:G:464:ALA:HB2	1.99	0.43
2:L:90:LYS:HZ3	2:L:113:ALA:HA	1.83	0.43
2:H:506:ASP:HB2	2:H:509:MET:HE2	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:206:ALA:HB3	2:J:209:ARG:HD3	2.01	0.43
2:J:304:TYR:HE1	2:J:363:ASP:HB2	1.84	0.43
2:K:583:ILE:HG12	2:K:588:ILE:HG12	1.99	0.43
1:F:24:THR:HG22	1:F:27:ARG:HH22	1.83	0.43
1:F:100:SER:HB2	2:H:296:PRO:O	2.19	0.43
2:H:109:ALA:HB2	2:H:351:LEU:HD11	2.00	0.43
2:I:188:TRP:HB2	2:I:214:LEU:HD21	2.00	0.43
2:J:531:VAL:HG12	2:J:540:ILE:HB	2.00	0.43
2:G:643:ARG:NH2	2:G:693:LYS:HE2	2.34	0.43
2:H:237:TYR:HE2	2:H:239:ARG:HD2	1.83	0.43
2:H:479:PRO:HB3	2:H:488:TYR:HB3	2.00	0.43
2:H:486:VAL:HG23	2:H:501:PHE:HB3	2.01	0.43
1:E:24:THR:HA	1:E:27:ARG:HG2	2.00	0.43
1:E:62:ARG:HA	1:E:65:GLU:HG2	1.99	0.43
2:G:434:ALA:HB1	2:G:441:LEU:HD11	2.00	0.43
2:I:334:ALA:HA	2:I:358:PRO:HB3	1.99	0.43
2:L:657:ARG:HH22	2:L:759:TYR:HE2	1.67	0.43
2:G:641:ASP:HA	2:G:693:LYS:HE3	2.00	0.43
2:H:742:TRP:HE3	2:H:744:ILE:HD11	1.83	0.43
2:I:399:LYS:HE2	2:I:419:PRO:HD3	2.01	0.43
2:K:808:LYS:HG2	2:K:809:ARG:HG3	2.00	0.43
2:G:40:LYS:HA	2:G:40:LYS:HD3	1.81	0.42
2:G:83:VAL:HG22	2:G:125:ILE:HD11	2.01	0.42
2:G:17:ILE:HG21	2:H:39:GLU:HA	2.01	0.42
2:H:359:ARG:NH2	2:H:364:ASP:HA	2.34	0.42
2:I:177:GLN:HB3	2:I:182:THR:HG22	2.01	0.42
2:J:432:LYS:HG3	2:J:433:HIS:HD2	1.83	0.42
2:K:482:MET:HE1	2:K:533:ASN:H	1.82	0.42
1:D:100:SER:HB2	2:L:297:THR:HA	2.01	0.42
1:E:59:ILE:HD12	1:E:59:ILE:HA	1.88	0.42
2:J:554:PHE:HB2	2:J:567:TRP:CZ3	2.55	0.42
2:G:359:ARG:HB3	2:G:407:TRP:CE2	2.55	0.42
2:L:441:LEU:HD23	2:L:452:ILE:HD11	1.99	0.42
2:L:738:ILE:HD13	2:L:738:ILE:HA	1.90	0.42
2:G:158:SER:HB3	2:G:238:VAL:HG13	2.02	0.42
2:G:554:PHE:CE1	2:G:565:MET:HB3	2.55	0.42
2:H:177:GLN:HB2	2:H:255:THR:OG1	2.19	0.42
2:J:122:ASP:H	2:J:138:LYS:NZ	2.18	0.42
2:L:174:LEU:HD22	2:L:258:VAL:HG12	2.00	0.42
2:L:271:ASN:C	2:L:290:ARG:HH21	2.27	0.42
2:L:296:PRO:HB2	2:L:299:SER:HB2	2.01	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:228:ILE:HG23	2:H:239:ARG:HG3	2.01	0.42
2:L:399:LYS:HE2	2:L:399:LYS:HB3	1.90	0.42
2:L:450:PHE:HE1	2:L:467:ILE:HG12	1.84	0.42
2:G:97:ARG:HD2	2:G:103:PHE:CZ	2.55	0.42
2:G:140:ARG:HH21	2:G:374:GLY:HA2	1.83	0.42
2:G:356:LEU:HD12	2:G:404:SER:HA	2.01	0.42
2:G:635:TYR:HE2	2:G:690:LEU:HB2	1.85	0.42
2:H:471:ASN:HD21	2:H:499:ARG:HH11	1.66	0.42
2:I:367:ASN:HD21	2:I:407:TRP:HB3	1.84	0.42
2:J:669:SER:OG	2:J:676:TYR:HB2	2.20	0.42
2:K:32:ASN:HB2	2:K:696:ALA:HA	2.02	0.42
2:K:698:TYR:HD2	2:K:785:PHE:HD2	1.67	0.42
2:K:730:THR:HG22	2:K:793:ALA:HA	2.01	0.42
2:L:183:LEU:HG	2:L:184:VAL:HG12	2.01	0.42
2:L:554:PHE:HB2	2:L:567:TRP:CZ3	2.55	0.42
2:H:79:LEU:HG	2:H:98:LYS:HG2	2.02	0.41
2:J:382:MET:HE3	2:J:382:MET:HB3	1.98	0.41
2:K:131:LYS:HB3	2:K:131:LYS:HE2	1.78	0.41
2:K:603:LYS:HB3	2:K:603:LYS:HE2	1.87	0.41
1:C:56:ASP:HA	1:C:59:ILE:HG22	2.01	0.41
1:F:74:MET:HG2	1:F:84:SER:HB2	2.02	0.41
2:G:359:ARG:HB3	2:G:407:TRP:CD2	2.56	0.41
2:H:696:ALA:HB3	2:H:787:ASN:HB3	2.01	0.41
2:K:648:THR:HB	2:K:653:ASN:HA	2.02	0.41
2:K:661:THR:HB	2:K:763:VAL:HG21	2.01	0.41
2:G:623:ALA:HB2	2:G:629:VAL:HG12	2.01	0.41
2:H:64:VAL:HA	2:H:86:ASP:HB3	2.01	0.41
2:K:489:ALA:HB1	2:K:527:ILE:HD12	2.02	0.41
2:K:623:ALA:HB2	2:K:629:VAL:HG12	2.02	0.41
2:K:728:SER:HA	2:K:767:THR:HA	2.01	0.41
2:G:499:ARG:HG2	2:G:514:PRO:HB3	2.03	0.41
2:H:57:ARG:HH11	2:H:591:ARG:HE	1.67	0.41
2:H:418:ASP:HB3	2:H:460:PRO:HG3	2.02	0.41
2:H:530:LEU:HD13	2:H:541:VAL:HG12	2.02	0.41
2:I:83:VAL:HG21	2:I:125:ILE:HD11	2.02	0.41
2:J:7:LEU:HD23	2:J:7:LEU:HA	1.95	0.41
2:J:485:TYR:HD1	2:J:502:GLU:HG2	1.85	0.41
2:J:573:ARG:HH21	2:J:639:HIS:CG	2.38	0.41
2:J:576:ILE:HD12	2:J:592:TYR:HB2	2.01	0.41
2:K:750:THR:HG22	2:K:752:ARG:N	2.36	0.41
2:L:12:PHE:O	2:L:26:TYR:HB2	2.21	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:103:ASP:O	1:D:106:GLN:HG2	2.20	0.41
2:G:696:ALA:HB3	2:G:787:ASN:HB3	2.02	0.41
2:J:370:ARG:HH21	2:J:396:ASN:HB3	1.85	0.41
2:J:723:TYR:HB2	2:J:772:THR:HB	2.02	0.41
2:L:774:ILE:HG22	2:L:776:MET:HB3	2.03	0.41
2:I:309:ALA:HA	2:I:321:VAL:HG12	2.03	0.41
2:I:752:ARG:HA	2:I:757:GLN:HE22	1.85	0.41
2:J:390:LEU:HB3	2:J:431:LEU:HB2	2.03	0.41
2:K:386:ARG:HD3	2:K:397:LEU:HB3	2.02	0.41
2:G:133:MET:HE1	2:G:354:PHE:HD2	1.85	0.41
2:G:394:LYS:HG3	2:G:422:VAL:C	2.46	0.41
2:H:618:LEU:HA	2:H:690:LEU:O	2.21	0.41
2:L:727:LEU:HD23	2:L:730:THR:HG21	2.03	0.41
1:F:45:ILE:H	1:F:45:ILE:HG12	1.61	0.41
2:G:91:LYS:HE2	2:G:91:LYS:HB2	1.84	0.41
2:G:432:LYS:HG3	2:G:433:HIS:CD2	2.55	0.41
2:H:370:ARG:NH1	2:H:419:PRO:HB2	2.36	0.41
2:H:398:SER:HB3	2:H:406:PHE:CZ	2.55	0.41
2:H:731:TYR:CD2	2:H:791:TYR:HB3	2.56	0.41
2:J:705:GLU:HB2	2:J:804:GLN:HE22	1.85	0.41
2:J:727:LEU:HD23	2:J:730:THR:HG21	2.02	0.41
2:K:636:ASN:HD21	2:K:639:HIS:HB2	1.85	0.41
2:L:309:ALA:HA	2:L:321:VAL:HG12	2.02	0.41
2:K:342:TYR:CE1	2:K:353:GLU:HG3	2.56	0.41
1:F:62:ARG:HA	1:F:65:GLU:HG2	2.03	0.40
2:I:225:TYR:HB3	2:I:248:TRP:HE1	1.86	0.40
2:I:484:SER:OG	2:I:504:GLN:HB2	2.21	0.40
2:L:132:LEU:HB2	2:L:344:LEU:HB3	2.03	0.40
2:L:432:LYS:HG3	2:L:433:HIS:CD2	2.57	0.40
1:E:124:LEU:H	1:E:124:LEU:HG	1.66	0.40
2:I:359:ARG:HH22	2:I:364:ASP:HB3	1.84	0.40
2:L:359:ARG:HH21	2:L:367:ASN:ND2	2.19	0.40
2:L:386:ARG:HH22	2:L:417:THR:HA	1.86	0.40
1:F:91:ILE:HD13	1:F:91:ILE:HA	1.94	0.40
2:H:10:PRO:HB3	2:H:27:CYS:SG	2.62	0.40
2:I:441:LEU:HB3	2:I:452:ILE:HB	2.03	0.40
2:J:579:ASN:HD22	2:J:591:ARG:HD3	1.86	0.40
2:H:47:PHE:HB3	2:H:598:MET:HG2	2.04	0.40
2:J:268:VAL:HB	2:J:270:LYS:NZ	2.36	0.40
2:J:335:PHE:CE2	2:J:356:LEU:HB2	2.57	0.40
2:J:489:ALA:HB1	2:J:527:ILE:HD12	2.03	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:596:LYS:H	2:J:596:LYS:HG2	1.54	0.40
1:C:76:MET:HE2	1:C:76:MET:HB3	1.98	0.40
1:E:44:ALA:HA	1:E:113:LEU:HD11	2.04	0.40
2:H:177:GLN:HG2	2:H:182:THR:HA	2.03	0.40
2:J:432:LYS:HG3	2:J:433:HIS:CD2	2.56	0.40
2:L:254:LEU:HD12	2:L:254:LEU:HA	1.96	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	112/179 (63%)	110 (98%)	2 (2%)	0	100	100
1	B	112/179 (63%)	109 (97%)	3 (3%)	0	100	100
1	C	112/179 (63%)	109 (97%)	3 (3%)	0	100	100
1	D	112/179 (63%)	110 (98%)	2 (2%)	0	100	100
1	E	112/179 (63%)	110 (98%)	2 (2%)	0	100	100
1	F	112/179 (63%)	112 (100%)	0	0	100	100
2	G	809/811 (100%)	744 (92%)	64 (8%)	1 (0%)	48	81
2	H	809/811 (100%)	754 (93%)	54 (7%)	1 (0%)	48	81
2	I	809/811 (100%)	758 (94%)	48 (6%)	3 (0%)	30	65
2	J	809/811 (100%)	757 (94%)	50 (6%)	2 (0%)	43	75
2	K	809/811 (100%)	749 (93%)	59 (7%)	1 (0%)	48	81
2	L	809/811 (100%)	755 (93%)	54 (7%)	0	100	100
All	All	5526/5940 (93%)	5177 (94%)	341 (6%)	8 (0%)	49	81

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	I	20	VAL
2	I	296	PRO
2	J	20	VAL
2	G	672	SER
2	K	20	VAL
2	I	25	GLY
2	H	26	TYR
2	J	25	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	86/126 (68%)	82 (95%)	4 (5%)	23	47
1	B	86/126 (68%)	84 (98%)	2 (2%)	44	63
1	C	86/126 (68%)	84 (98%)	2 (2%)	44	63
1	D	86/126 (68%)	84 (98%)	2 (2%)	44	63
1	E	86/126 (68%)	82 (95%)	4 (5%)	23	47
1	F	86/126 (68%)	84 (98%)	2 (2%)	44	63
2	G	699/699 (100%)	667 (95%)	32 (5%)	24	47
2	H	699/699 (100%)	662 (95%)	37 (5%)	20	45
2	I	699/699 (100%)	665 (95%)	34 (5%)	22	47
2	J	699/699 (100%)	664 (95%)	35 (5%)	22	46
2	K	699/699 (100%)	668 (96%)	31 (4%)	25	48
2	L	699/699 (100%)	656 (94%)	43 (6%)	16	42
All	All	4710/4950 (95%)	4482 (95%)	228 (5%)	24	47

All (228) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	28	LEU
1	A	45	ILE
1	A	96	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	113	LEU
1	B	28	LEU
1	B	74	MET
1	C	74	MET
1	C	114	TYR
1	D	28	LEU
1	D	106	GLN
1	E	28	LEU
1	E	45	ILE
1	E	74	MET
1	E	124	LEU
1	F	45	ILE
1	F	74	MET
2	G	11	ILE
2	G	17	ILE
2	G	51	ILE
2	G	64	VAL
2	G	116	PHE
2	G	132	LEU
2	G	134	ILE
2	G	183	LEU
2	G	238	VAL
2	G	255	THR
2	G	269	VAL
2	G	293	GLN
2	G	295	ASP
2	G	302	VAL
2	G	314	ILE
2	G	344	LEU
2	G	364	ASP
2	G	452	ILE
2	G	469	THR
2	G	486	VAL
2	G	513	VAL
2	G	522	LEU
2	G	541	VAL
2	G	589	THR
2	G	594	THR
2	G	610	VAL
2	G	645	ILE
2	G	688	VAL
2	G	690	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	G	718	LEU
2	G	737	ILE
2	G	763	VAL
2	H	1	MET
2	H	14	VAL
2	H	15	SER
2	H	38	GLN
2	H	94	VAL
2	H	128	VAL
2	H	183	LEU
2	H	208	THR
2	H	274	THR
2	H	285	VAL
2	H	314	ILE
2	H	322	ILE
2	H	350	VAL
2	H	356	LEU
2	H	400	THR
2	H	414	LEU
2	H	422	VAL
2	H	452	ILE
2	H	480	VAL
2	H	513	VAL
2	H	519	ILE
2	H	523	ILE
2	H	537	THR
2	H	541	VAL
2	H	573	ARG
2	H	583	ILE
2	H	594	THR
2	H	648	THR
2	H	661	THR
2	H	671	ASP
2	H	714	THR
2	H	718	LEU
2	H	737	ILE
2	H	772	THR
2	H	780	ASP
2	H	782	THR
2	H	786	ILE
2	I	14	VAL
2	I	16	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	I	36	ASP
2	I	64	VAL
2	I	77	GLN
2	I	128	VAL
2	I	132	LEU
2	I	145	VAL
2	I	183	LEU
2	I	228	ILE
2	I	269	VAL
2	I	274	THR
2	I	289	ILE
2	I	293	GLN
2	I	302	VAL
2	I	314	ILE
2	I	322	ILE
2	I	337	THR
2	I	397	LEU
2	I	475	LEU
2	I	482	MET
2	I	513	VAL
2	I	520	ILE
2	I	537	THR
2	I	569	THR
2	I	581	ILE
2	I	663	LEU
2	I	712	VAL
2	I	715	THR
2	I	733	ILE
2	I	746	VAL
2	I	748	GLU
2	I	772	THR
2	I	782	THR
2	J	6	THR
2	J	14	VAL
2	J	15	SER
2	J	16	THR
2	J	17	ILE
2	J	64	VAL
2	J	106	ILE
2	J	116	PHE
2	J	125	ILE
2	J	132	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	J	134	ILE
2	J	144	THR
2	J	145	VAL
2	J	148	ILE
2	J	159	LEU
2	J	183	LEU
2	J	228	ILE
2	J	238	VAL
2	J	269	VAL
2	J	310	LEU
2	J	322	ILE
2	J	337	THR
2	J	452	ILE
2	J	513	VAL
2	J	537	THR
2	J	541	VAL
2	J	581	ILE
2	J	594	THR
2	J	610	VAL
2	J	636	ASN
2	J	654	VAL
2	J	714	THR
2	J	725	LEU
2	J	733	ILE
2	J	748	GLU
2	K	12	PHE
2	K	15	SER
2	K	20	VAL
2	K	38	GLN
2	K	64	VAL
2	K	106	ILE
2	K	144	THR
2	K	150	ASN
2	K	219	ASN
2	K	228	ILE
2	K	269	VAL
2	K	273	GLN
2	K	274	THR
2	K	285	VAL
2	K	302	VAL
2	K	310	LEU
2	K	314	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	K	344	LEU
2	K	422	VAL
2	K	505	VAL
2	K	513	VAL
2	K	569	THR
2	K	581	ILE
2	K	594	THR
2	K	714	THR
2	K	718	LEU
2	K	725	LEU
2	K	733	ILE
2	K	737	ILE
2	K	761	ASP
2	K	782	THR
2	L	12	PHE
2	L	14	VAL
2	L	20	VAL
2	L	51	ILE
2	L	128	VAL
2	L	144	THR
2	L	184	VAL
2	L	197	ASN
2	L	232	TYR
2	L	238	VAL
2	L	257	LEU
2	L	267	ILE
2	L	269	VAL
2	L	274	THR
2	L	280	LEU
2	L	297	THR
2	L	310	LEU
2	L	317	ILE
2	L	322	ILE
2	L	337	THR
2	L	422	VAL
2	L	452	ILE
2	L	477	VAL
2	L	490	VAL
2	L	513	VAL
2	L	519	ILE
2	L	541	VAL
2	L	569	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	L	579	ASN
2	L	583	ILE
2	L	587	VAL
2	L	594	THR
2	L	610	VAL
2	L	648	THR
2	L	675	VAL
2	L	712	VAL
2	L	718	LEU
2	L	725	LEU
2	L	733	ILE
2	L	748	GLU
2	L	761	ASP
2	L	782	THR
2	L	786	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (93) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	37	GLN
1	A	51	ASN
1	A	77	ASN
1	A	112	GLN
1	B	50	GLN
1	C	29	ASN
1	C	37	GLN
1	C	102	ASN
1	D	50	GLN
1	D	77	ASN
1	D	90	HIS
1	E	112	GLN
1	F	29	ASN
1	F	77	ASN
1	F	90	HIS
1	F	112	GLN
2	G	38	GLN
2	G	104	GLN
2	G	136	ASN
2	G	235	ASN
2	G	331	GLN
2	G	396	ASN
2	G	409	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	G	437	HIS
2	G	508	ASN
2	G	518	HIS
2	G	536	GLN
2	G	585	ASN
2	G	662	GLN
2	G	722	HIS
2	G	769	GLN
2	H	38	GLN
2	H	136	ASN
2	H	147	ASN
2	H	273	GLN
2	H	340	HIS
2	H	384	GLN
2	H	409	ASN
2	H	437	HIS
2	H	471	ASN
2	H	491	ASN
2	H	492	HIS
2	H	508	ASN
2	H	536	GLN
2	H	662	GLN
2	I	77	GLN
2	I	119	GLN
2	I	230	GLN
2	I	271	ASN
2	I	367	ASN
2	I	405	GLN
2	I	409	ASN
2	I	437	HIS
2	I	508	ASN
2	I	518	HIS
2	I	639	HIS
2	I	741	HIS
2	J	38	GLN
2	J	136	ASN
2	J	235	ASN
2	J	367	ASN
2	J	396	ASN
2	J	409	ASN
2	J	413	ASN
2	J	579	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	J	758	GLN
2	K	38	GLN
2	K	177	GLN
2	K	197	ASN
2	K	273	GLN
2	K	293	GLN
2	K	340	HIS
2	K	384	GLN
2	K	409	ASN
2	K	437	HIS
2	K	491	ASN
2	K	630	GLN
2	K	729	ASN
2	L	110	ASN
2	L	119	GLN
2	L	156	GLN
2	L	161	ASN
2	L	231	GLN
2	L	235	ASN
2	L	241	ASN
2	L	251	ASN
2	L	271	ASN
2	L	293	GLN
2	L	428	ASN
2	L	437	HIS
2	L	492	HIS
2	L	536	GLN
2	L	579	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 (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

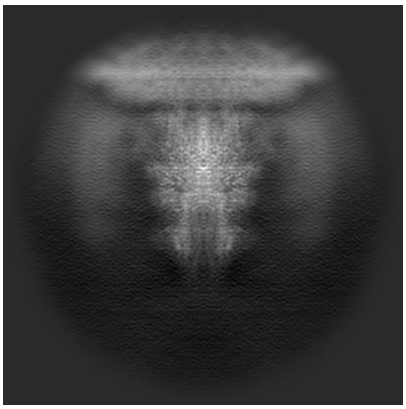
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-74616. These allow visual inspection of the internal detail of the map and identification of artifacts.

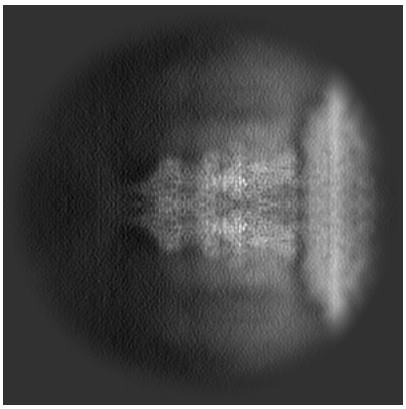
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

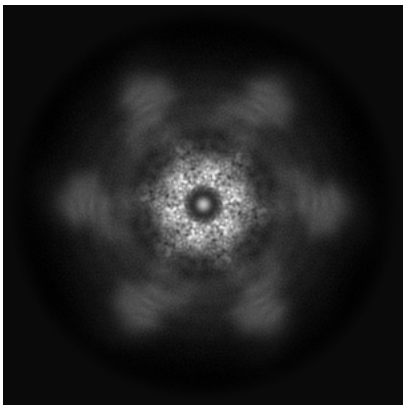
6.1.1 Primary map



X

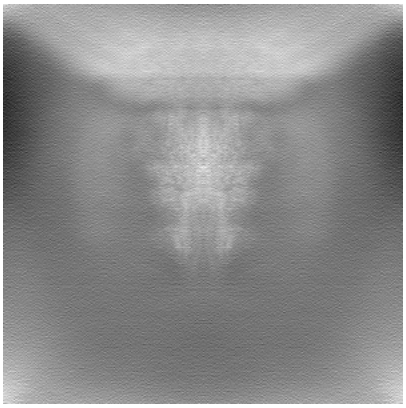


Y

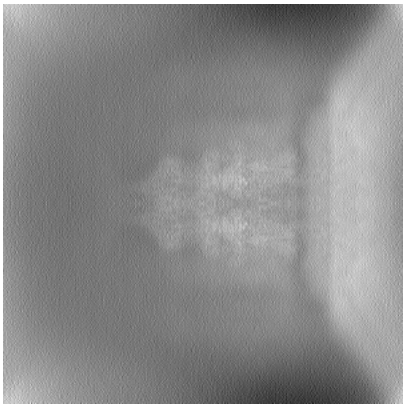


Z

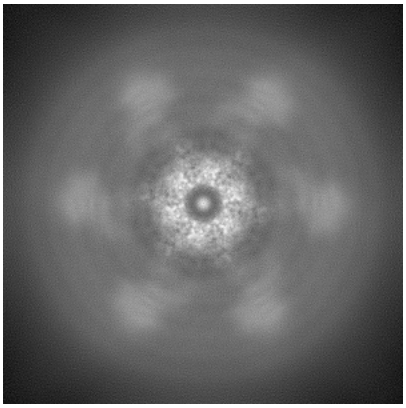
6.1.2 Raw map



X



Y

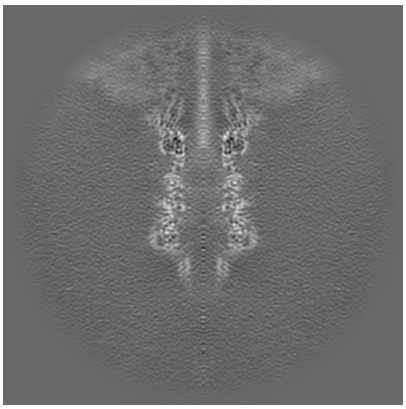


Z

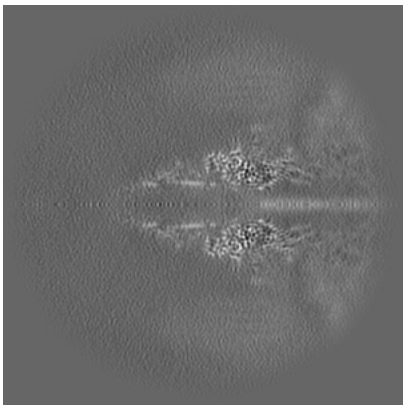
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

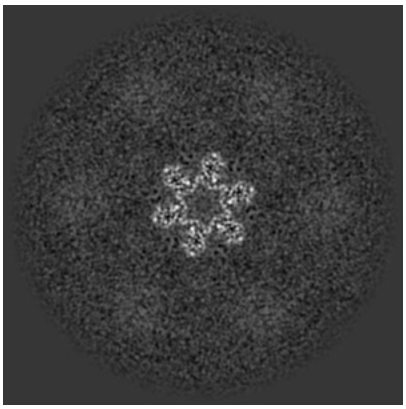
6.2.1 Primary map



X Index: 224

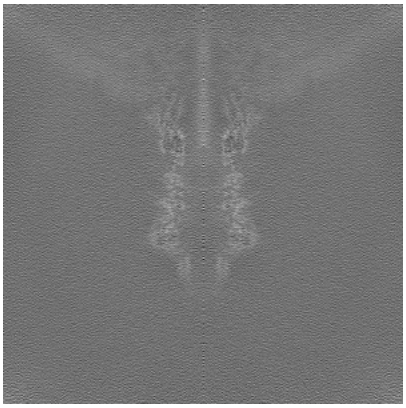


Y Index: 224

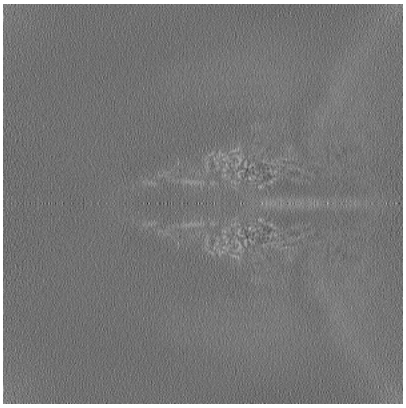


Z Index: 224

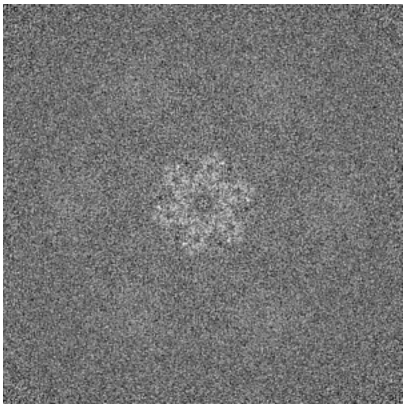
6.2.2 Raw map



X Index: 224



Y Index: 224

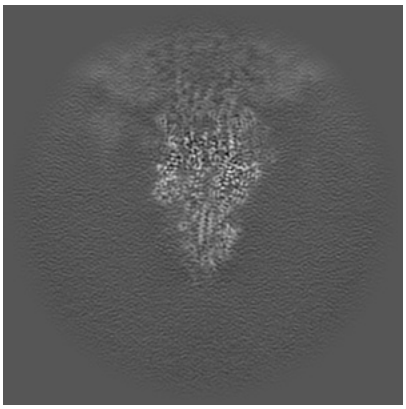


Z Index: 224

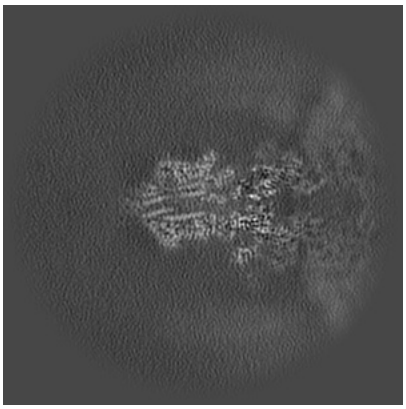
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

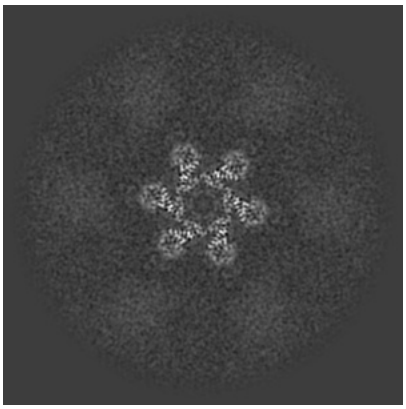
6.3.1 Primary map



X Index: 199

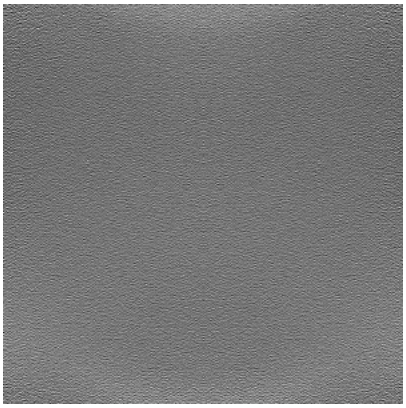


Y Index: 244

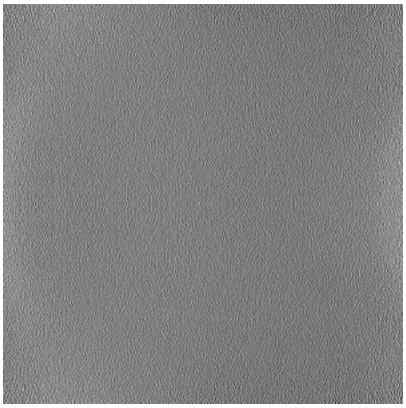


Z Index: 265

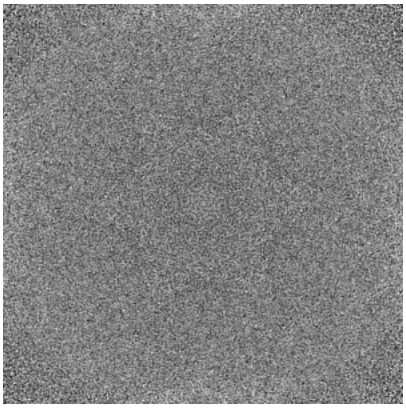
6.3.2 Raw map



X Index: 0



Y Index: 0

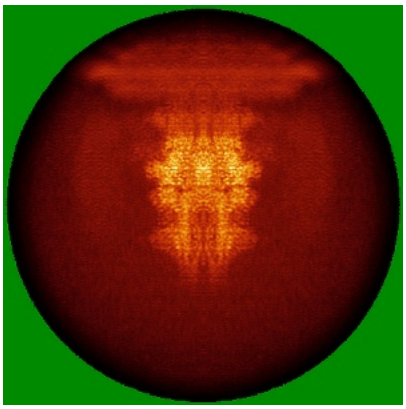


Z Index: 446

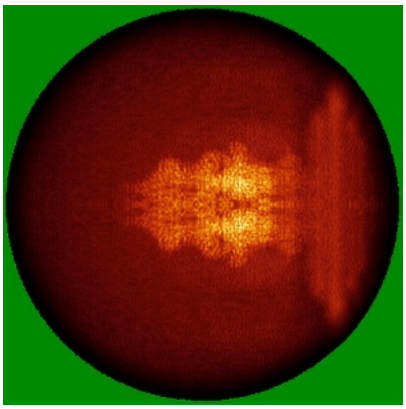
The images above show the largest variance slices of the map in three orthogonal directions.

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

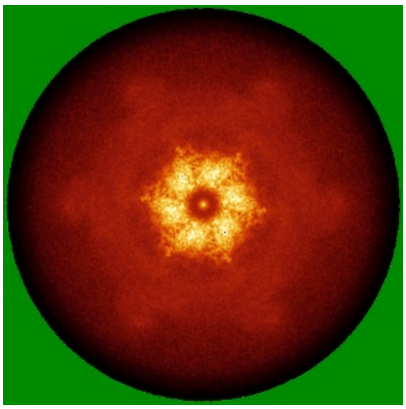
6.4.1 Primary map



X

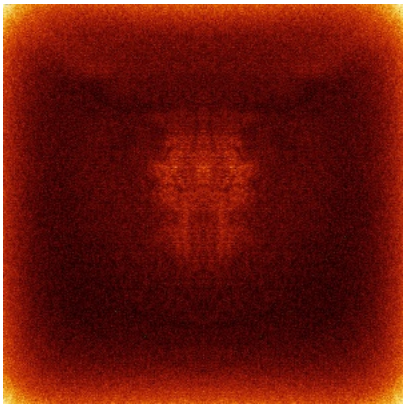


Y

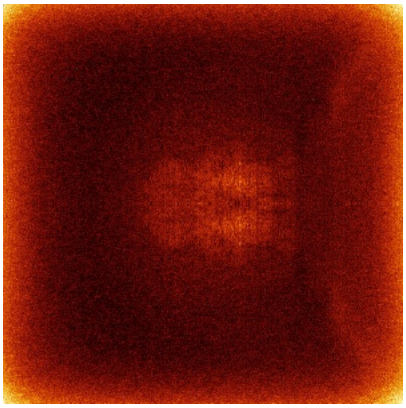


Z

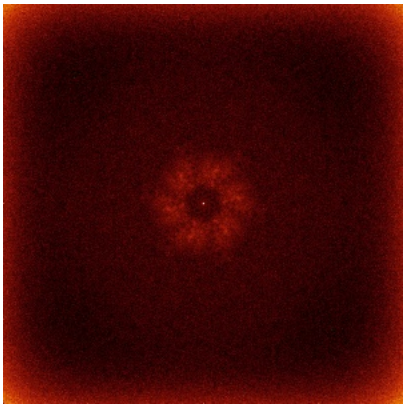
6.4.2 Raw map



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)

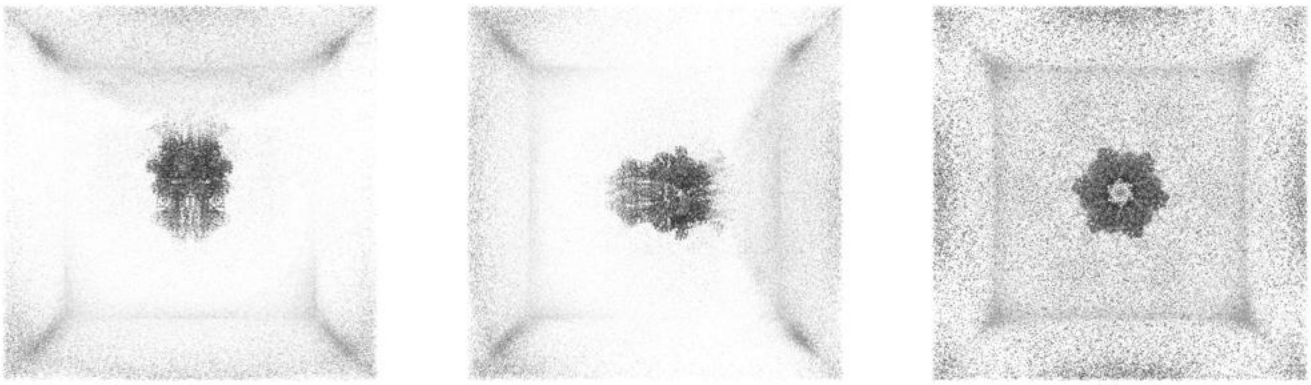
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. 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.

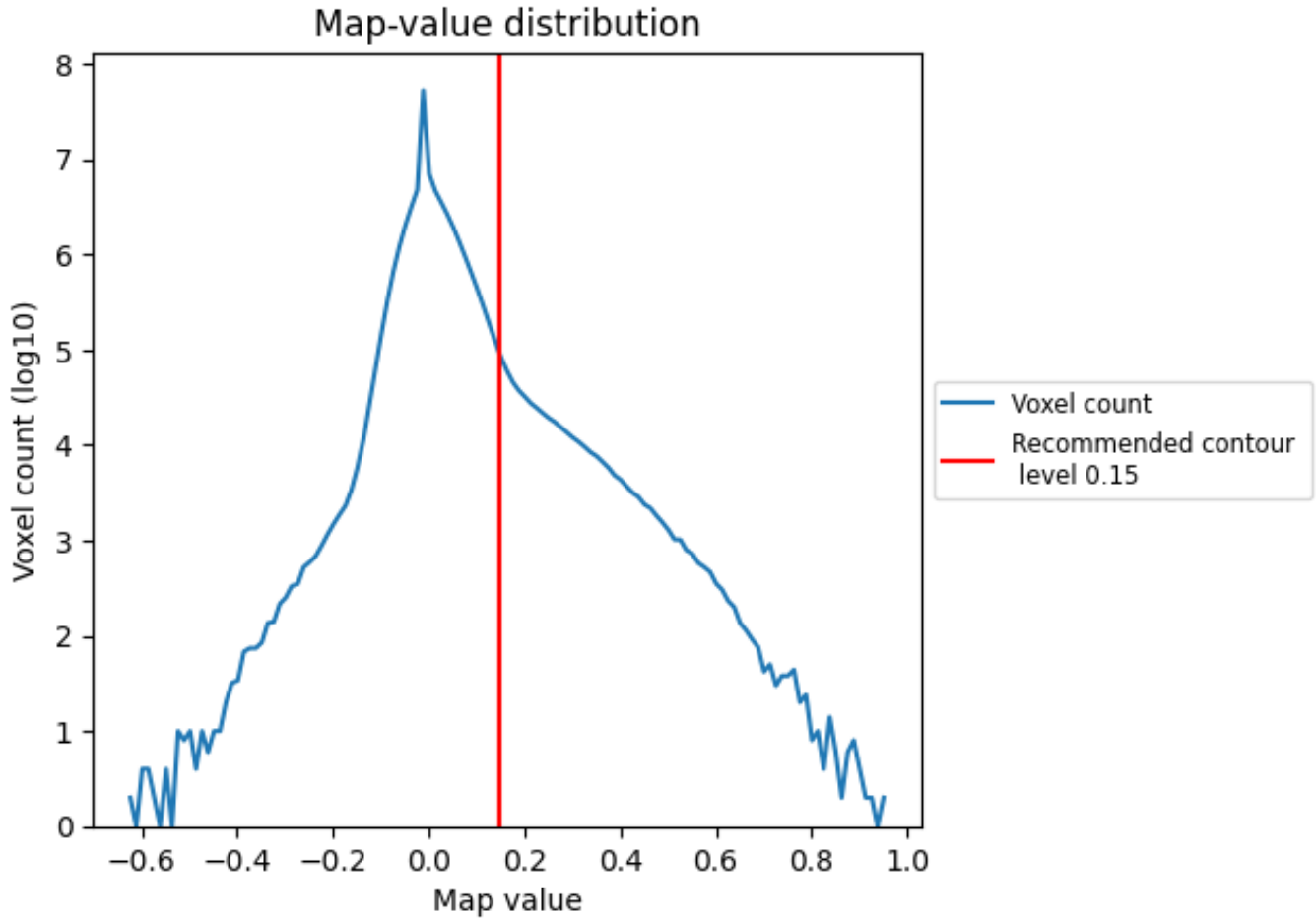
6.6 Mask visualisation (i)

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

7 Map analysis

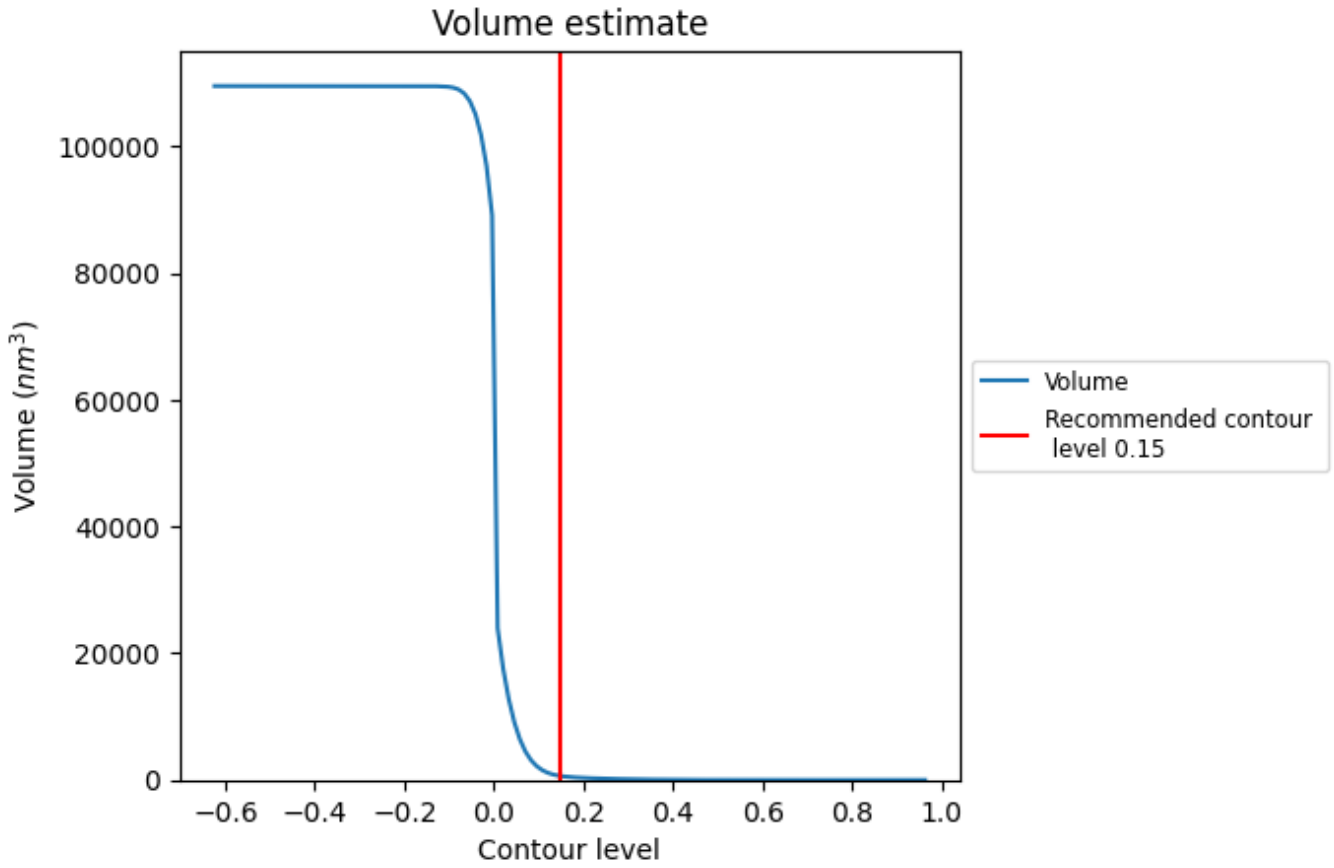
This section contains the results of statistical analysis of the map.

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.

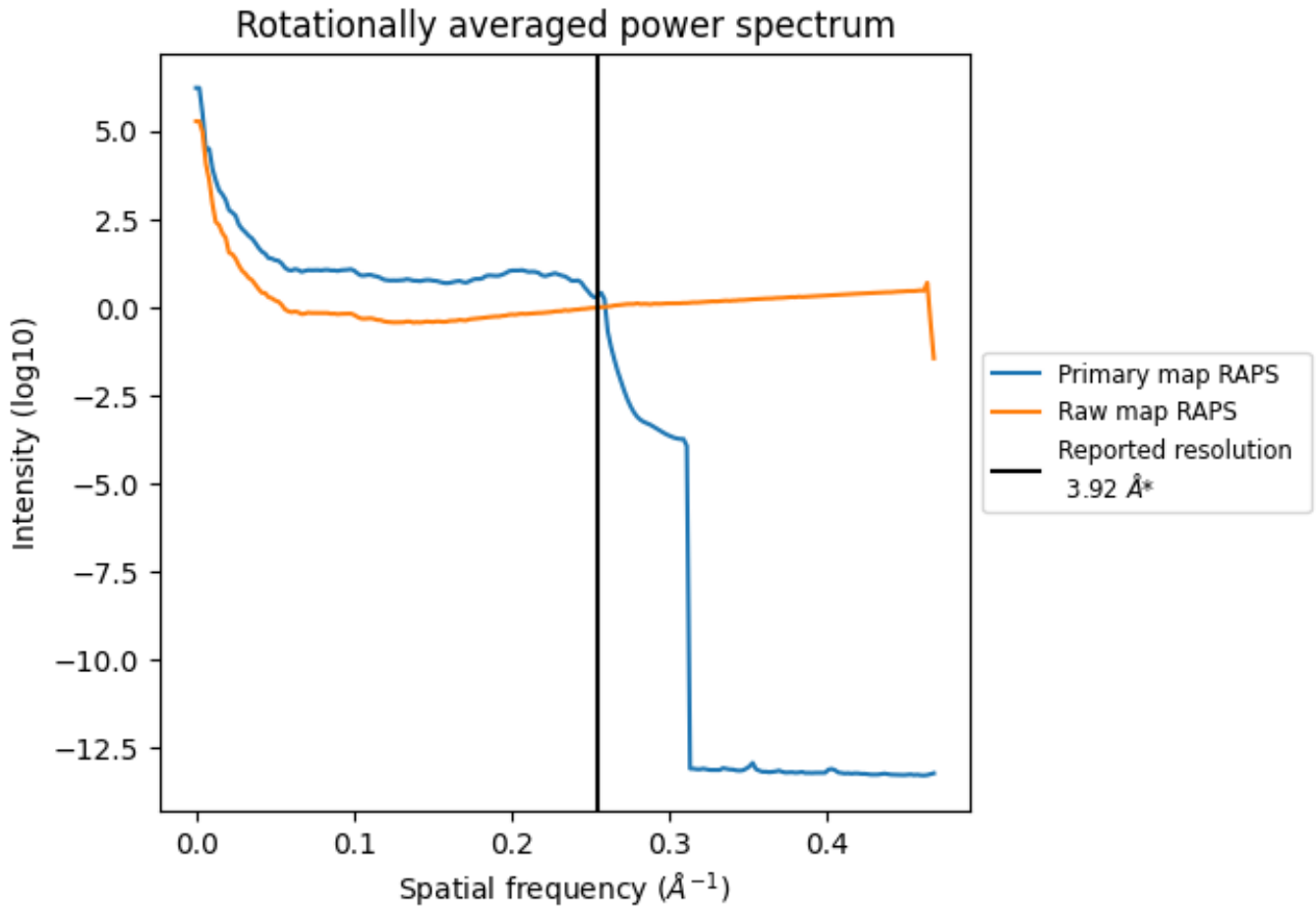
7.2 Volume estimate



The volume at the recommended contour level is 619 nm^3; this corresponds to an approximate mass of 559 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)

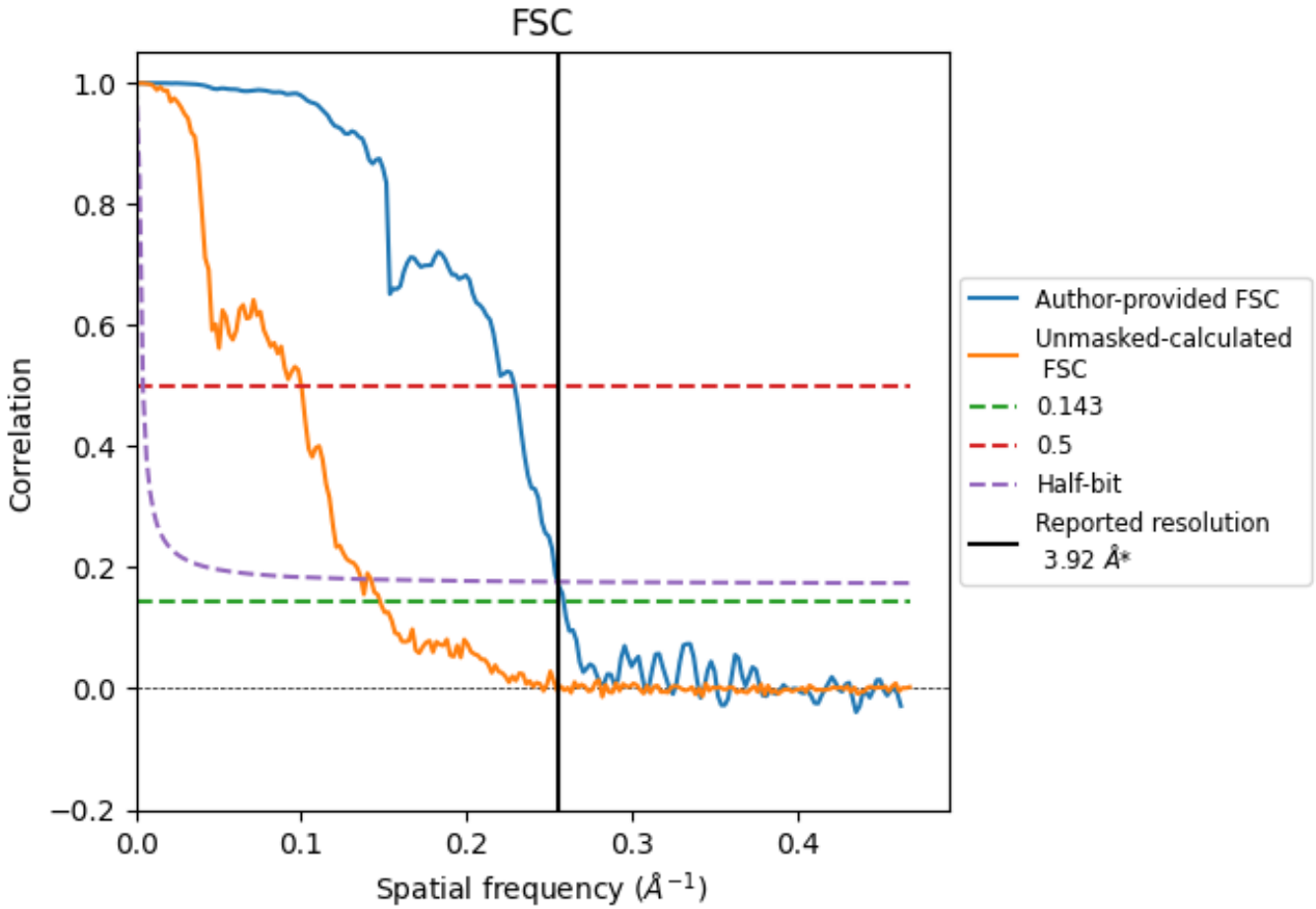


*Reported resolution corresponds to spatial frequency of 0.255 $Å^{-1}$

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 0.255 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.92	-	-
Author-provided FSC curve	3.86	4.37	3.92
Unmasked-calculated*	6.77	10.00	7.35

*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 6.77 differs from the reported value 3.92 by more than 10 %

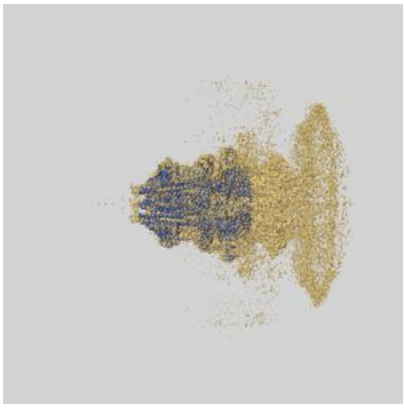
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-74616 and PDB model 9ZRH. Per-residue inclusion information can be found in section 3 on page 5.

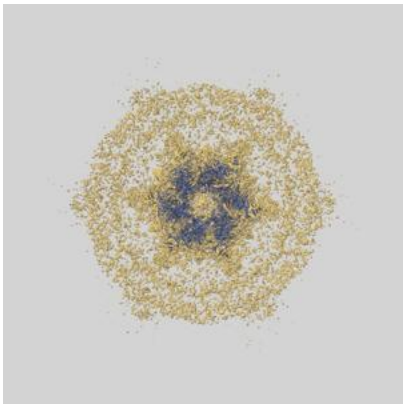
9.1 Map-model overlay



X



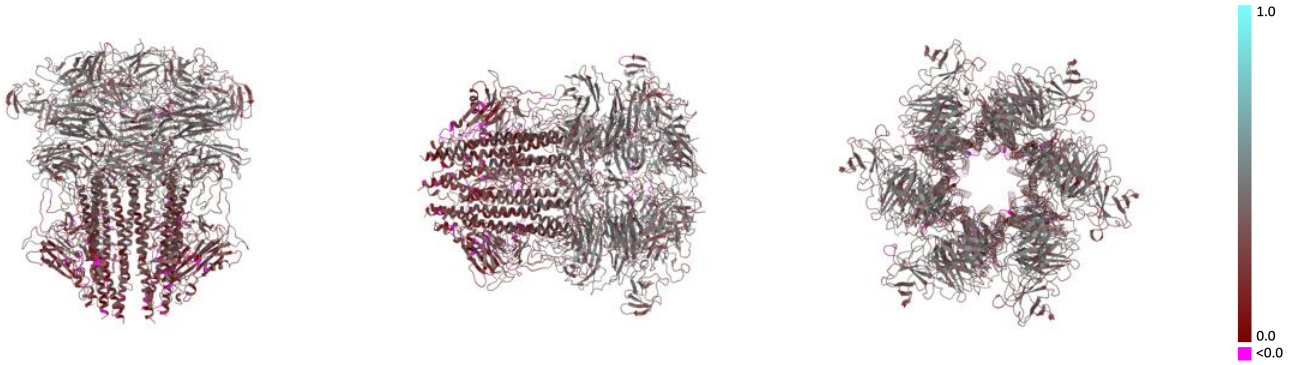
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.15 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.

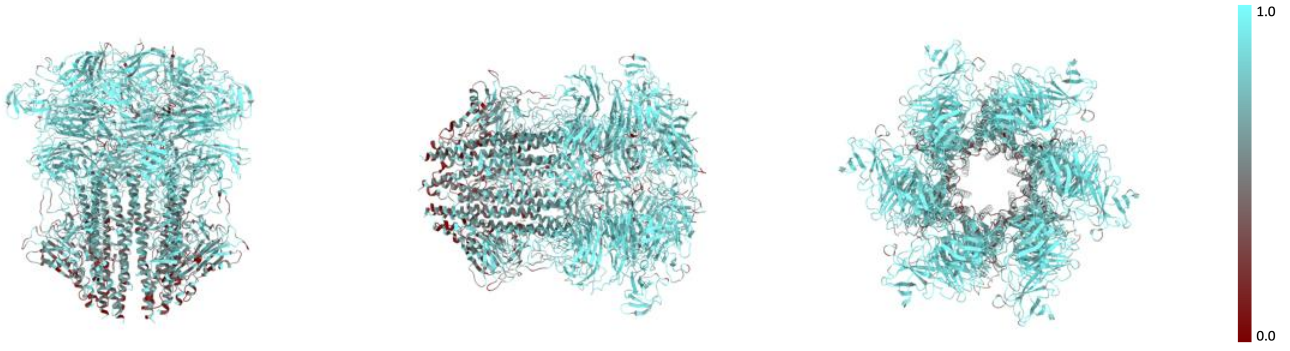
9.2 Q-score mapped to coordinate model (i)



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.

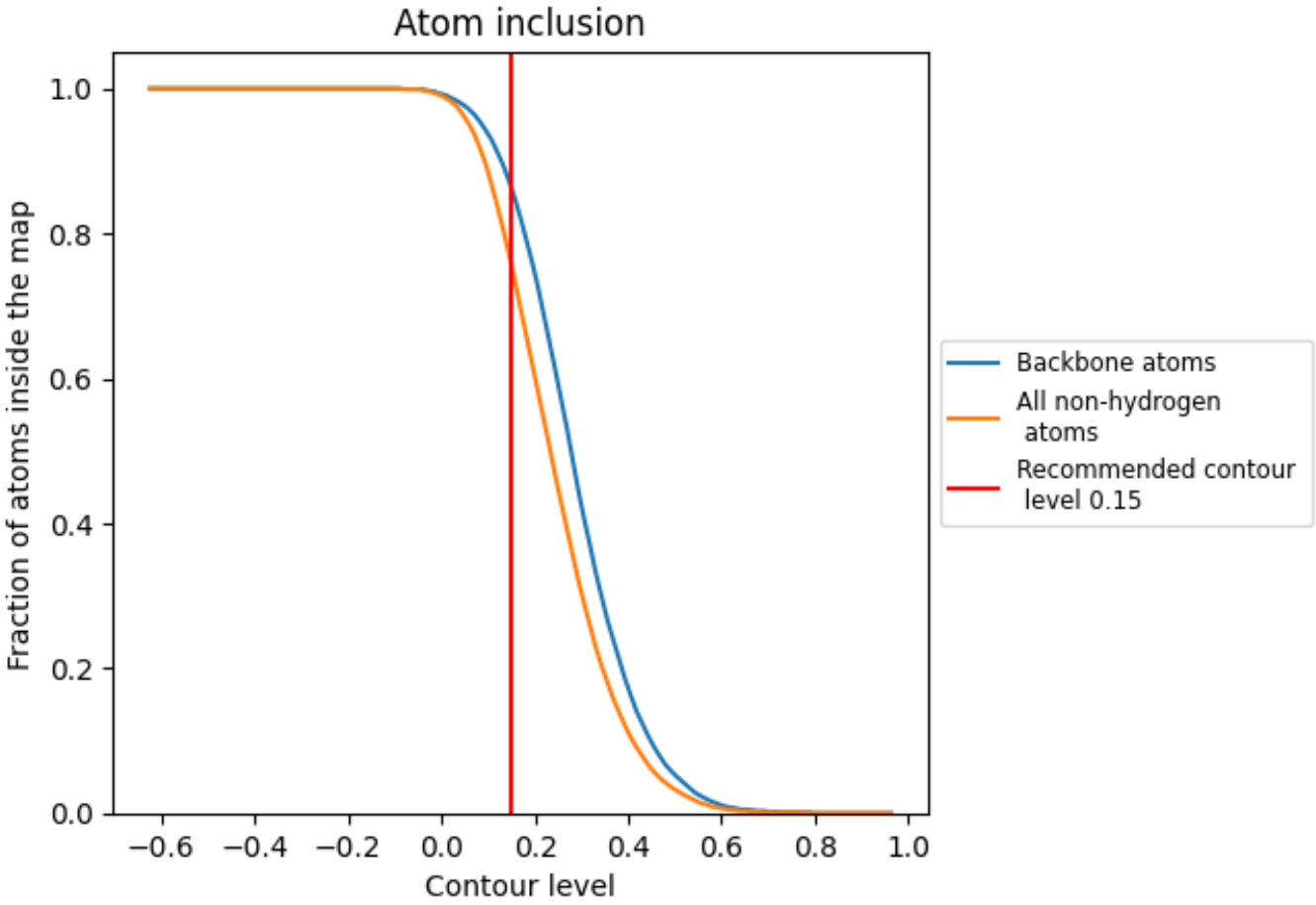
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.15).

9.4 Atom inclusion (i)



At the recommended contour level, 86% of all backbone atoms, 76% 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 (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7570	0.3460
A	0.6480	0.2790
B	0.6230	0.2820
C	0.6140	0.2740
D	0.6390	0.2770
E	0.6450	0.2830
F	0.6290	0.2700
G	0.7690	0.3530
H	0.7750	0.3530
I	0.7740	0.3560
J	0.7790	0.3600
K	0.7710	0.3550
L	0.7710	0.3540

