



Full wwPDB EM Validation Report ⓘ

Feb 4, 2024 – 06:15 PM EST

PDB ID : 8SXI
EMDB ID : EMD-40853
Title : CH505 Disulfide Stapled SOSIP Bound to b12 Fab
Authors : Henderson, R.
Deposited on : 2023-05-22
Resolution : 4.50 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

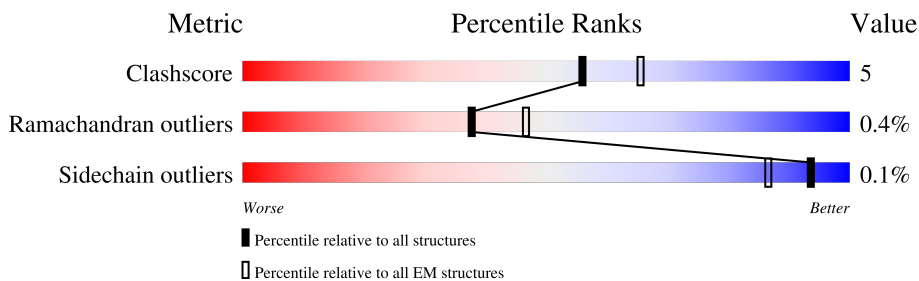
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.50 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	456	
1	E	456	
1	I	456	
2	B	126	
2	F	126	
2	J	126	
3	C	127	
3	G	127	

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Mol	Chain	Length	Quality of chain
3	K	127	
4	D	108	
4	H	108	
4	L	108	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 19257 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 Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	452	3569	2246	623	670	30	0	0
1	E	452	3569	2246	623	670	30	0	0
1	I	452	3569	2246	623	670	30	0	0

There are 54 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	32	GLU	-	expression tag	UNP M4M3Q1
A	33	ASN	-	expression tag	UNP M4M3Q1
A	34	LEU	-	expression tag	UNP M4M3Q1
A	68	ILE	VAL	conflict	UNP M4M3Q1
A	127	CYS	VAL	conflict	UNP M4M3Q1
A	167	CYS	ASP	conflict	UNP M4M3Q1
A	197	ASP	ASN	conflict	UNP M4M3Q1
A	204	VAL	ALA	conflict	UNP M4M3Q1
A	208	LEU	VAL	conflict	UNP M4M3Q1
A	255	LEU	VAL	conflict	UNP M4M3Q1
A	279	LYS	ASN	conflict	UNP M4M3Q1
A	458	TYR	GLY	conflict	UNP M4M3Q1
A	488	LYS	GLU	conflict	UNP M4M3Q1
A	489	ILE	VAL	conflict	UNP M4M3Q1
A	490	GLU	LYS	conflict	UNP M4M3Q1
A	498	ARG	ASN	conflict	UNP M4M3Q1
A	499	CYS	ALA	conflict	UNP M4M3Q1
A	500	LYS	ARG	conflict	UNP M4M3Q1
E	32	GLU	-	expression tag	UNP M4M3Q1
E	33	ASN	-	expression tag	UNP M4M3Q1
E	34	LEU	-	expression tag	UNP M4M3Q1
E	68	ILE	VAL	conflict	UNP M4M3Q1
E	127	CYS	VAL	conflict	UNP M4M3Q1
E	167	CYS	ASP	conflict	UNP M4M3Q1

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Chain	Residue	Modelled	Actual	Comment	Reference
E	197	ASP	ASN	conflict	UNP M4M3Q1
E	204	VAL	ALA	conflict	UNP M4M3Q1
E	208	LEU	VAL	conflict	UNP M4M3Q1
E	255	LEU	VAL	conflict	UNP M4M3Q1
E	279	LYS	ASN	conflict	UNP M4M3Q1
E	458	TYR	GLY	conflict	UNP M4M3Q1
E	488	LYS	GLU	conflict	UNP M4M3Q1
E	489	ILE	VAL	conflict	UNP M4M3Q1
E	490	GLU	LYS	conflict	UNP M4M3Q1
E	498	ARG	ASN	conflict	UNP M4M3Q1
E	499	CYS	ALA	conflict	UNP M4M3Q1
E	500	LYS	ARG	conflict	UNP M4M3Q1
I	32	GLU	-	expression tag	UNP M4M3Q1
I	33	ASN	-	expression tag	UNP M4M3Q1
I	34	LEU	-	expression tag	UNP M4M3Q1
I	68	ILE	VAL	conflict	UNP M4M3Q1
I	127	CYS	VAL	conflict	UNP M4M3Q1
I	167	CYS	ASP	conflict	UNP M4M3Q1
I	197	ASP	ASN	conflict	UNP M4M3Q1
I	204	VAL	ALA	conflict	UNP M4M3Q1
I	208	LEU	VAL	conflict	UNP M4M3Q1
I	255	LEU	VAL	conflict	UNP M4M3Q1
I	279	LYS	ASN	conflict	UNP M4M3Q1
I	458	TYR	GLY	conflict	UNP M4M3Q1
I	488	LYS	GLU	conflict	UNP M4M3Q1
I	489	ILE	VAL	conflict	UNP M4M3Q1
I	490	GLU	LYS	conflict	UNP M4M3Q1
I	498	ARG	ASN	conflict	UNP M4M3Q1
I	499	CYS	ALA	conflict	UNP M4M3Q1
I	500	LYS	ARG	conflict	UNP M4M3Q1

- Molecule 2 is a protein called HIV-1 gp41.

Mol	Chain	Residues	Atoms				AltConf	Trace	
2	B	126	Total	C	N	O	S	0	0
			1001	633	172	190	6		
2	F	126	Total	C	N	O	S	0	0
			1001	633	172	190	6		
2	J	126	Total	C	N	O	S	0	0
			1001	633	172	190	6		

- Molecule 3 is a protein called b12 Heavy Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	127	Total	C	N	O	S	0	0
			1013	642	175	191	5		
3	G	127	Total	C	N	O	S	0	0
			1013	642	175	191	5		
3	K	127	Total	C	N	O	S	0	0
			1013	642	175	191	5		

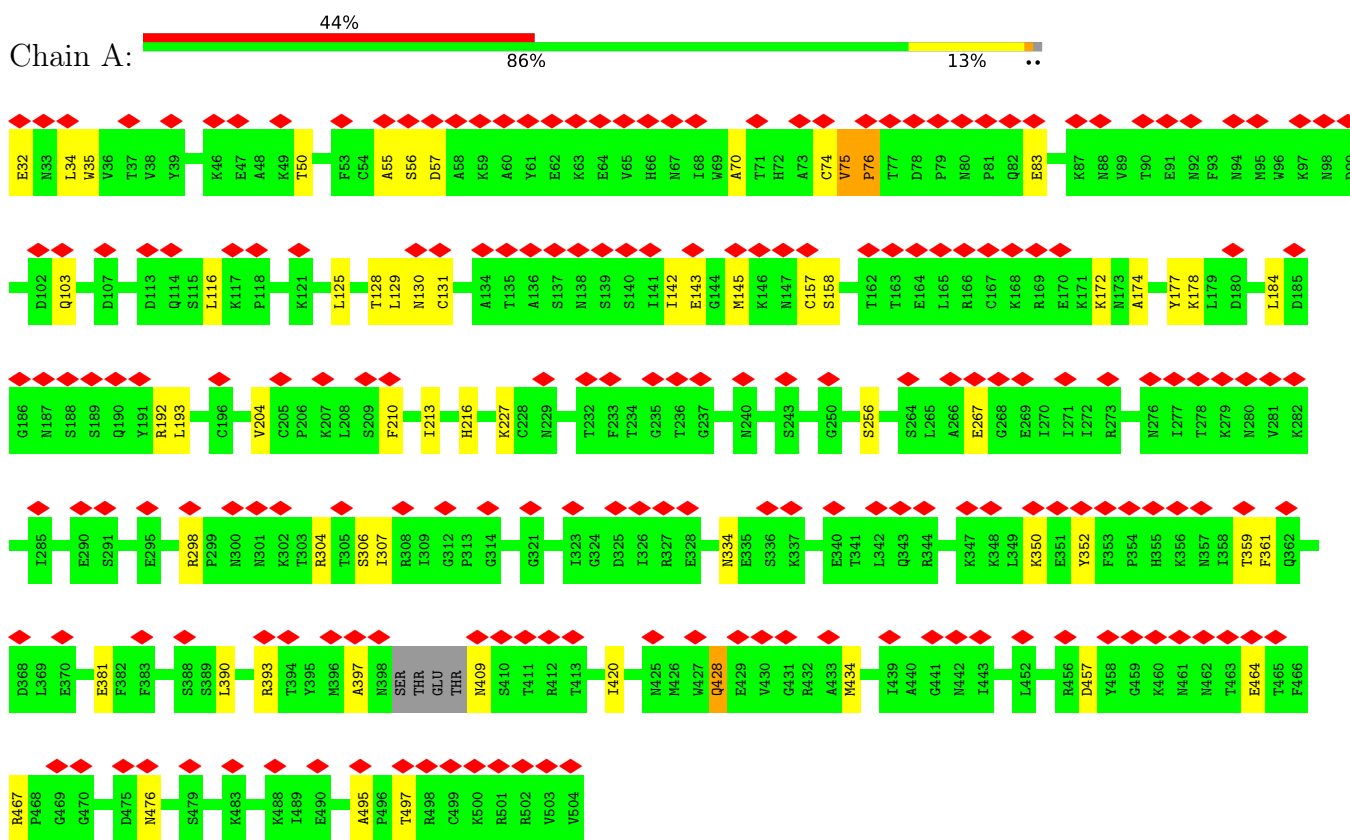
- Molecule 4 is a protein called b12 Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	108	Total	C	N	O	S	0	0
			836	520	154	160	2		
4	H	108	Total	C	N	O	S	0	0
			836	520	154	160	2		
4	L	108	Total	C	N	O	S	0	0
			836	520	154	160	2		

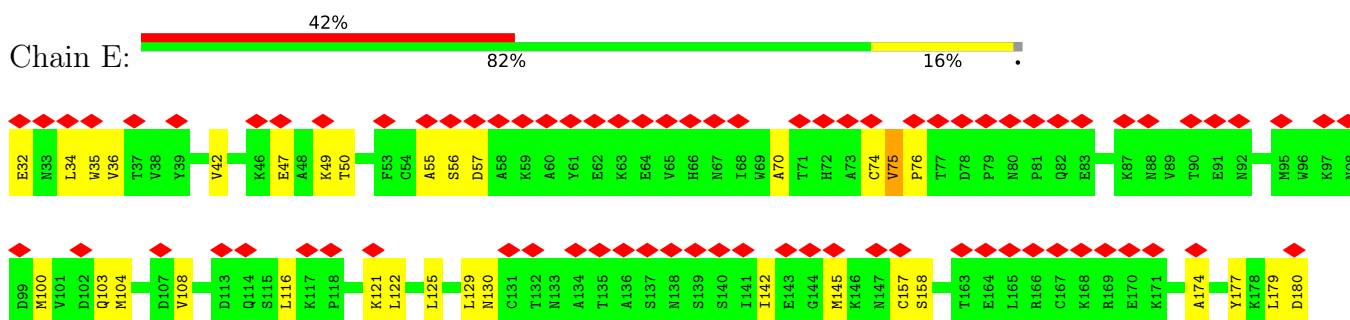
3 Residue-property plots

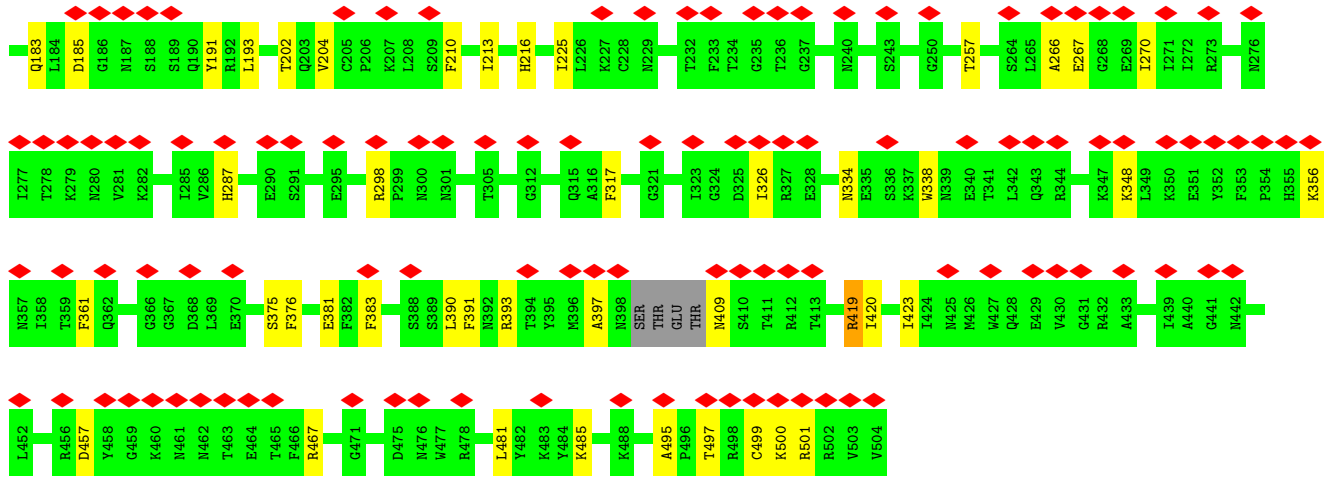
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Envelope glycoprotein gp160

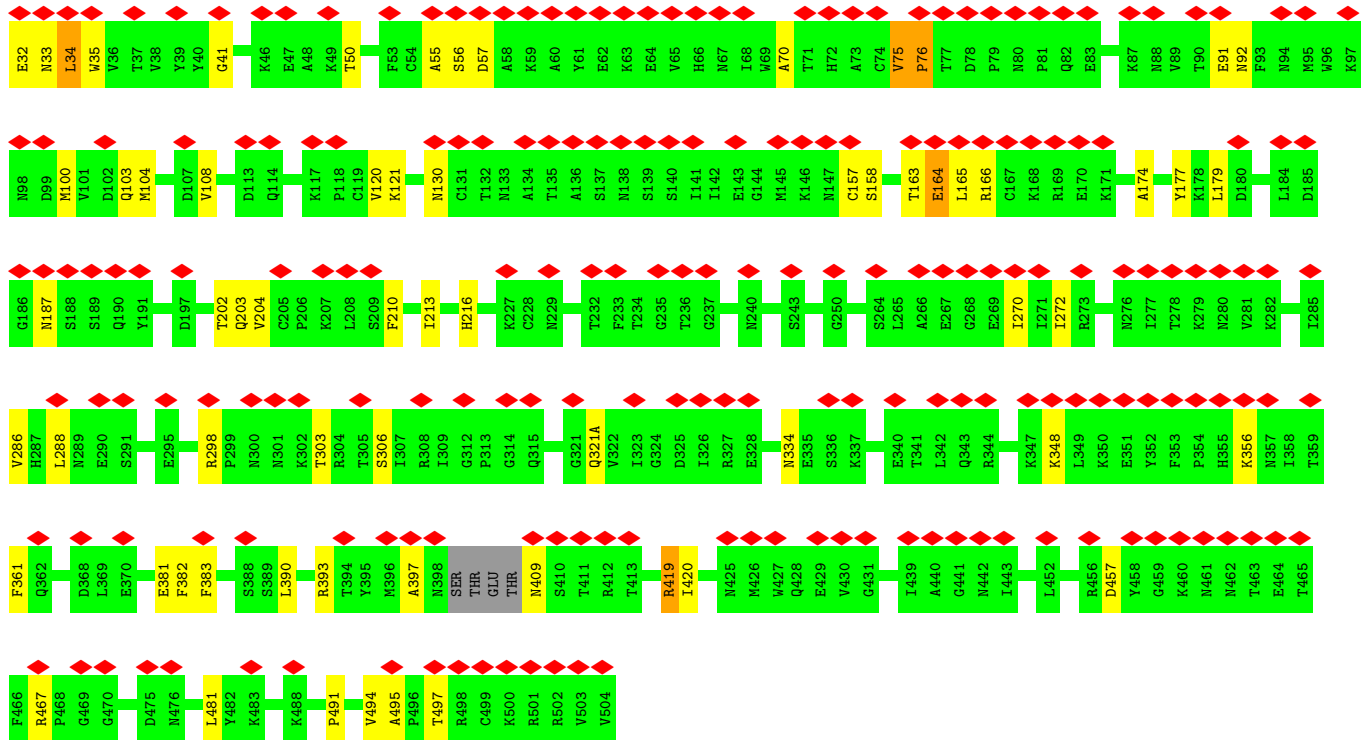
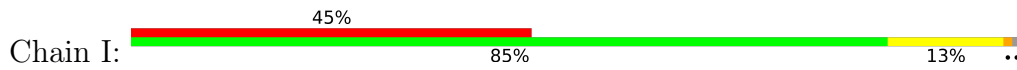


- Molecule 1: Envelope glycoprotein gp160

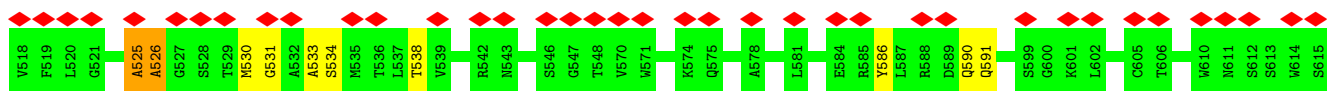
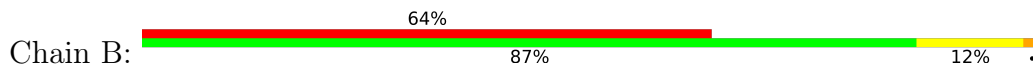


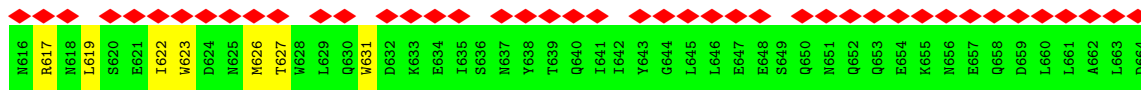


- Molecule 1: Envelope glycoprotein gp160

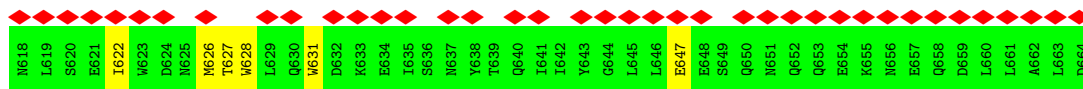
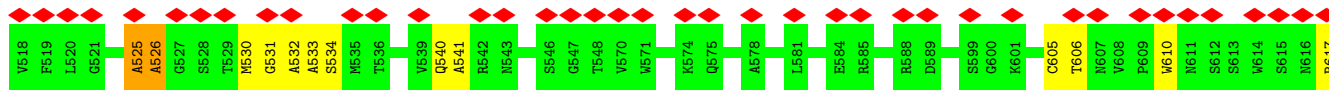
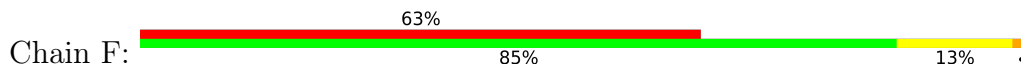


- Molecule 2: HIV-1 gp41

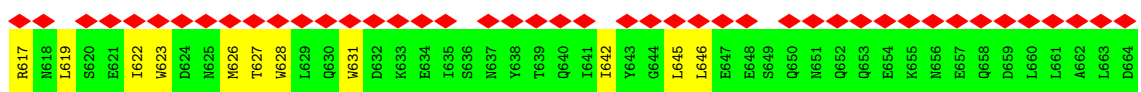
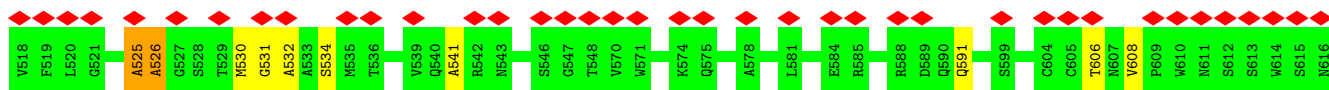
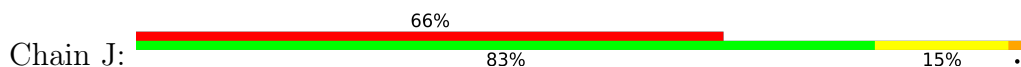




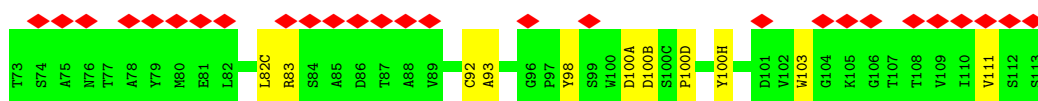
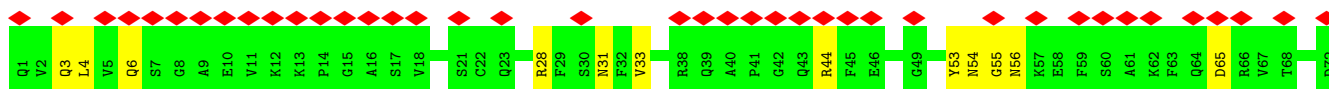
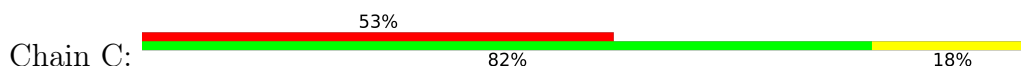
• Molecule 2: HIV-1 gp41



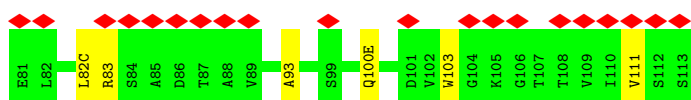
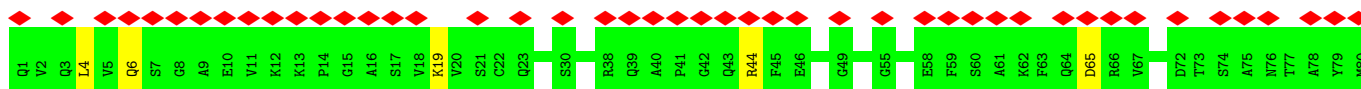
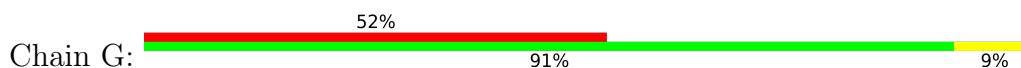
• Molecule 2: HIV-1 gp41



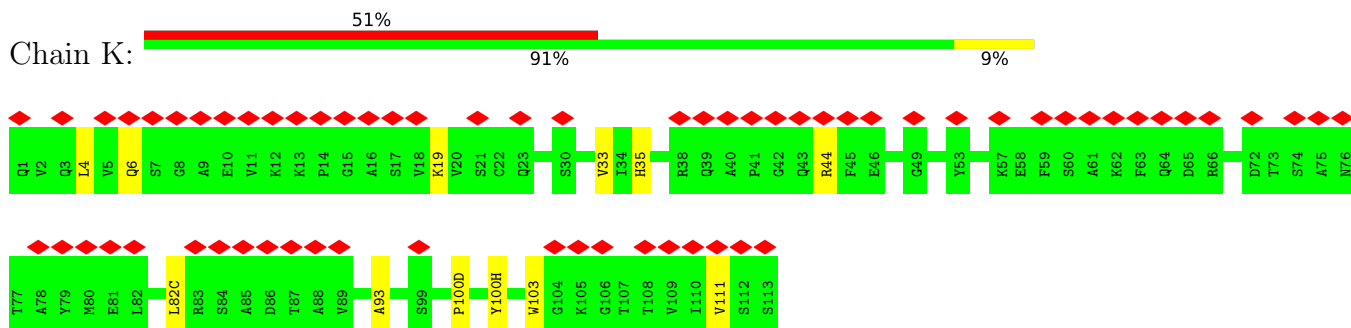
• Molecule 3: b12 Heavy Chain



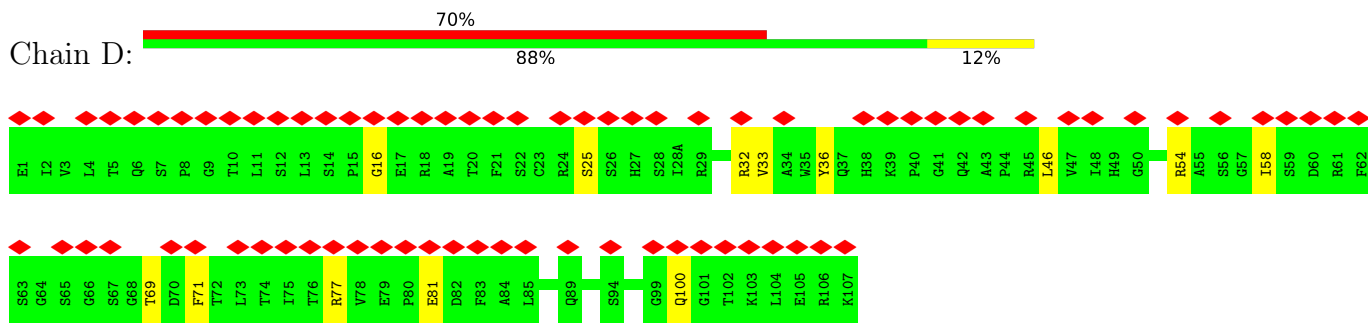
• Molecule 3: b12 Heavy Chain



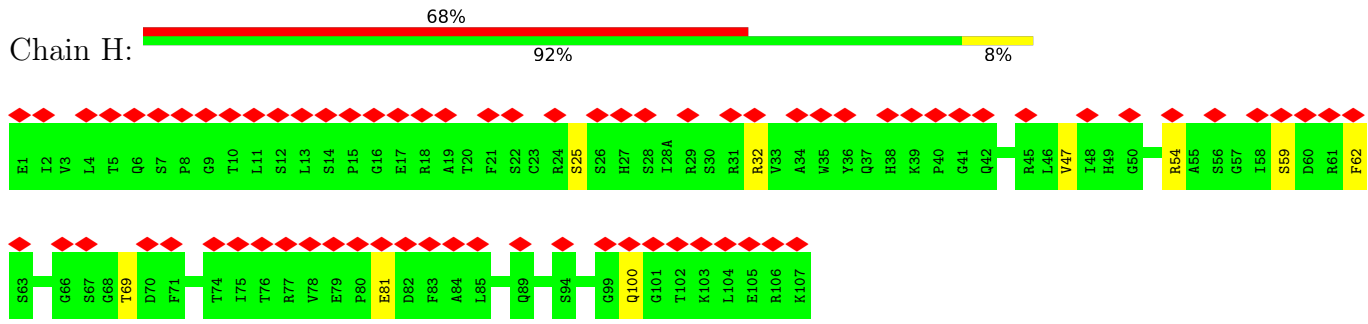
• Molecule 3: b12 Heavy Chain



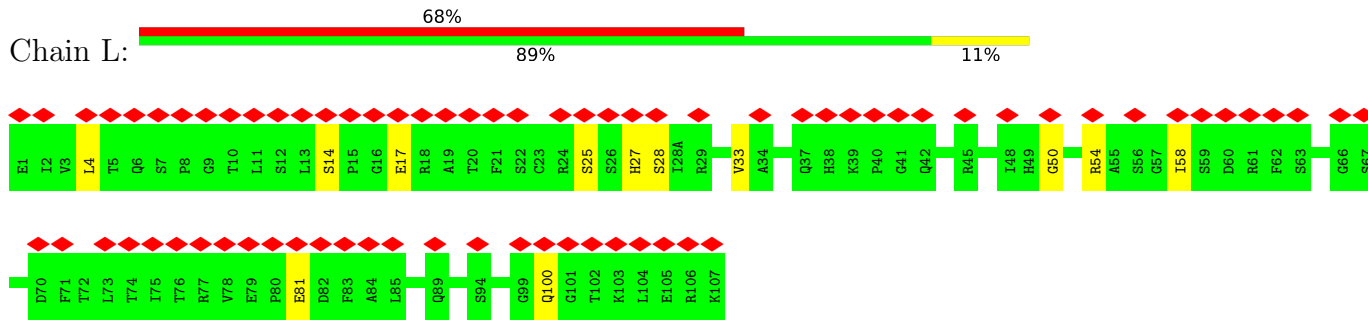
• Molecule 4: b12 Light Chain



• Molecule 4: b12 Light Chain



• Molecule 4: b12 Light Chain



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	151789	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	100	Depositor
Maximum defocus (nm)	2480	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.728	Depositor
Minimum map value	-0.508	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.194	Depositor
Map size (Å)	262.2, 262.2, 262.2	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.874, 0.874, 0.874	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.33	0/3640	0.67	3/4932 (0.1%)
1	E	0.31	0/3640	0.64	0/4932
1	I	0.33	0/3640	0.67	2/4932 (0.0%)
2	B	0.30	0/1019	0.66	3/1382 (0.2%)
2	F	0.31	0/1019	0.64	3/1382 (0.2%)
2	J	0.29	0/1019	0.63	3/1382 (0.2%)
3	C	0.33	0/1042	0.65	1/1416 (0.1%)
3	G	0.30	0/1042	0.61	0/1416
3	K	0.29	0/1042	0.61	0/1416
4	D	0.32	0/855	0.70	0/1155
4	H	0.29	0/855	0.67	0/1155
4	L	0.30	0/855	0.72	0/1155
All	All	0.31	0/19668	0.66	15/26655 (0.1%)

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	4
1	E	0	2
1	I	0	2
2	B	0	1
2	J	0	1
All	All	0	10

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	76	PRO	CA-N-CD	-8.99	98.91	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	76	PRO	CA-N-CD	-6.75	102.05	111.50
1	I	390	LEU	CA-CB-CG	6.32	129.84	115.30
2	B	531	GLY	C-N-CA	5.83	136.29	121.70
2	J	531	GLY	C-N-CA	5.80	136.19	121.70
2	F	525	ALA	C-N-CA	5.66	135.86	121.70
2	B	525	ALA	C-N-CA	5.65	135.82	121.70
2	J	525	ALA	C-N-CA	5.59	135.68	121.70
2	J	626	MET	C-N-CA	5.54	135.54	121.70
2	F	531	GLY	C-N-CA	5.41	135.22	121.70
3	C	100(A)	ASP	CB-CG-OD1	5.33	123.10	118.30
2	B	626	MET	C-N-CA	5.28	134.91	121.70
1	A	390	LEU	CA-CB-CG	5.24	127.35	115.30
1	A	428	GLN	CA-CB-CG	5.21	124.86	113.40
2	F	626	MET	C-N-CA	5.12	134.51	121.70

There are no chirality outliers.

All (10) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	184	LEU	Peptide
1	A	304	ARG	Sidechain
1	A	34	LEU	Peptide
1	A	352	TYR	Peptide
2	B	627	THR	Peptide
1	E	34	LEU	Peptide
1	E	419	ARG	Sidechain
1	I	34	LEU	Peptide
1	I	419	ARG	Peptide
2	J	532	ALA	Peptide

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	3569	0	3540	36	0
1	E	3569	0	3540	53	0
1	I	3569	0	3540	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1001	0	978	11	0
2	F	1001	0	978	16	0
2	J	1001	0	978	14	0
3	C	1013	0	955	14	0
3	G	1013	0	955	7	0
3	K	1013	0	955	10	0
4	D	836	0	815	9	0
4	H	836	0	815	6	0
4	L	836	0	815	8	0
All	All	19257	0	18864	199	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 5.

All (199) 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:I:270:ILE:O	1:I:348:LYS:NZ	2.13	0.81
1:E:130:ASN:O	1:E:158:SER:OG	1.99	0.80
1:E:47:GLU:OE1	1:E:485:LYS:NZ	2.15	0.79
1:E:257:THR:HG1	1:E:375:SER:HG	1.24	0.75
1:I:130:ASN:O	1:I:158:SER:OG	2.02	0.75
1:I:157:CYS:N	1:I:174:ALA:O	2.21	0.73
1:E:157:CYS:N	1:E:174:ALA:O	2.23	0.70
3:K:44:ARG:NH1	4:L:100:GLN:OE1	2.24	0.69
3:K:82(C):LEU:HD11	3:K:111:VAL:HG22	1.75	0.68
1:A:306:SER:OG	3:G:65:ASP:OD1	2.12	0.68
4:D:16:GLY:O	4:D:77:ARG:NH2	2.27	0.67
1:I:204:VAL:HG11	1:I:210:PHE:HE1	1.59	0.67
1:I:35:TRP:O	1:I:497:THR:N	2.27	0.66
3:G:100(E):GLN:O	4:H:32:ARG:NH2	2.29	0.65
1:A:157:CYS:N	1:A:174:ALA:O	2.29	0.65
3:C:44:ARG:NE	4:D:100:GLN:OE1	2.30	0.65
4:L:25:SER:OG	4:L:27:HIS:O	2.14	0.65
1:E:142:ILE:HD11	1:E:326:ILE:HG21	1.80	0.64
2:J:627:THR:HG22	2:J:628:TRP:H	1.62	0.64
1:E:334:ASN:ND2	1:E:409:ASN:O	2.32	0.63
3:K:33:VAL:HG21	3:K:100(H):TYR:CE1	2.34	0.63
1:A:130:ASN:O	1:A:158:SER:OG	2.17	0.63
1:A:204:VAL:HG11	1:A:210:PHE:CE1	2.35	0.62
3:C:33:VAL:HG21	3:C:100(H):TYR:CE1	2.34	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:617:ARG:HG2	2:J:622:ILE:HG21	1.81	0.62
1:E:179:LEU:HD11	1:E:419:ARG:NH2	2.15	0.61
1:I:100:MET:SD	1:I:481:LEU:HD13	2.40	0.61
1:E:267:GLU:N	1:E:267:GLU:OE2	2.34	0.61
1:E:376:PHE:O	1:E:383:PHE:N	2.33	0.61
1:A:131:CYS:SG	1:A:158:SER:N	2.74	0.60
2:B:617:ARG:HG2	2:B:622:ILE:HG21	1.83	0.60
1:A:204:VAL:HG11	1:A:210:PHE:HE1	1.66	0.60
1:A:495:ALA:HB2	2:B:631:TRP:HH2	1.67	0.60
1:E:204:VAL:HG11	1:E:210:PHE:CE1	2.37	0.60
3:G:82(C):LEU:HD23	3:G:111:VAL:HG22	1.84	0.60
3:C:82(C):LEU:HD23	3:C:111:VAL:HG22	1.84	0.59
1:A:267:GLU:N	1:A:267:GLU:OE2	2.34	0.59
4:H:54:ARG:NH1	4:H:59:SER:O	2.35	0.59
1:I:179:LEU:HD13	3:K:100(D):PRO:HG3	1.83	0.59
1:A:334:ASN:ND2	1:A:409:ASN:O	2.34	0.59
2:F:627:THR:HG22	2:F:628:TRP:H	1.67	0.59
1:A:50:THR:O	1:A:103:GLN:NE2	2.36	0.59
1:E:500:LYS:NZ	2:F:606:THR:O	2.31	0.58
2:B:530:MET:O	2:B:534:SER:N	2.35	0.58
1:E:35:TRP:O	1:E:497:THR:N	2.36	0.58
4:L:14:SER:N	4:L:17:GLU:OE2	2.36	0.58
3:C:54:ASN:ND2	3:C:56:ASN:OD1	2.37	0.58
2:F:530:MET:O	2:F:534:SER:N	2.36	0.58
1:A:70:ALA:HB2	1:A:213:ILE:CD1	2.33	0.58
1:I:91:GLU:OE1	1:I:92:ASN:N	2.36	0.57
3:G:44:ARG:NE	4:H:100:GLN:OE1	2.38	0.57
1:A:75:VAL:HB	1:A:76:PRO:HD3	1.87	0.57
1:A:35:TRP:O	1:A:497:THR:N	2.37	0.57
1:E:104:MET:O	1:E:108:VAL:HG23	2.04	0.57
1:A:359:THR:N	1:A:464:GLU:O	2.38	0.57
1:A:83:GLU:OE1	1:A:227:LYS:NZ	2.36	0.56
1:E:495:ALA:HB2	2:F:631:TRP:HH2	1.70	0.56
2:F:617:ARG:HB3	2:F:622:ILE:HG21	1.87	0.56
1:E:179:LEU:HD11	1:E:419:ARG:CZ	2.35	0.56
1:A:56:SER:OG	1:A:57:ASP:N	2.39	0.56
2:F:541:ALA:O	2:J:591:GLN:NE2	2.39	0.56
1:I:361:PHE:N	1:I:393:ARG:O	2.39	0.56
4:D:81:GLU:N	4:D:81:GLU:OE1	2.39	0.56
1:E:142:ILE:CD1	1:E:326:ILE:HG21	2.35	0.56
4:D:54:ARG:NH2	4:D:58:ILE:O	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:204:VAL:HG11	1:I:210:PHE:CE1	2.41	0.55
2:B:619:LEU:O	2:B:619:LEU:HD23	2.06	0.55
1:I:104:MET:HE3	1:I:481:LEU:HD11	1.88	0.55
1:E:183:GLN:N	1:E:183:GLN:OE1	2.40	0.55
1:E:501:ARG:NH2	2:F:605:CYS:O	2.39	0.55
1:A:177:TYR:CE1	1:A:420:ILE:HG23	2.42	0.55
1:E:270:ILE:O	1:E:348:LYS:NZ	2.37	0.55
3:G:4:LEU:O	3:G:6:GLN:NE2	2.40	0.54
1:E:495:ALA:HB2	2:F:631:TRP:CH2	2.42	0.54
4:L:81:GLU:N	4:L:81:GLU:OE2	2.40	0.54
1:A:298:ARG:NH1	1:A:381:GLU:OE2	2.40	0.54
1:E:56:SER:OG	1:E:57:ASP:N	2.38	0.54
1:I:298:ARG:NH1	1:I:381:GLU:OE2	2.40	0.54
1:E:338:TRP:CZ2	1:E:390:LEU:HD21	2.43	0.53
1:A:143:GLU:O	1:A:178:LYS:NZ	2.35	0.53
1:E:100:MET:SD	1:E:481:LEU:HD23	2.48	0.53
1:A:192:ARG:NH1	1:I:164:GLU:OE2	2.41	0.53
1:I:334:ASN:ND2	1:I:409:ASN:O	2.40	0.53
3:K:35:HIS:HB2	3:K:93:ALA:HB3	1.90	0.53
3:C:83:ARG:O	3:C:111:VAL:HG21	2.08	0.52
1:E:42:VAL:O	2:F:540:GLN:NE2	2.43	0.52
1:I:70:ALA:HB2	1:I:213:ILE:CD1	2.40	0.52
4:H:25:SER:OG	4:H:69:THR:OG1	2.09	0.52
1:I:50:THR:O	1:I:103:GLN:NE2	2.39	0.52
3:C:28:ARG:NE	3:C:31:ASN:OD1	2.43	0.52
3:G:83:ARG:O	3:G:111:VAL:HG21	2.09	0.52
1:I:56:SER:OG	1:I:57:ASP:N	2.43	0.52
2:B:591:GLN:NE2	2:J:541:ALA:O	2.42	0.51
1:E:122:LEU:HD21	1:E:317:PHE:CE1	2.46	0.51
1:I:272:ILE:HG12	1:I:286:VAL:HG12	1.93	0.51
1:E:125:LEU:HD22	1:E:193:LEU:HD11	1.93	0.51
4:D:25:SER:O	4:D:69:THR:OG1	2.28	0.50
1:E:180:ASP:HB3	1:E:423:ILE:HD12	1.92	0.50
1:I:495:ALA:HB2	2:J:631:TRP:HH2	1.75	0.50
1:E:70:ALA:HB2	1:E:213:ILE:CD1	2.41	0.50
1:I:121:LYS:HG2	1:I:202:THR:HG22	1.94	0.50
1:E:177:TYR:HE1	1:E:420:ILE:HG23	1.77	0.50
1:I:177:TYR:CE1	1:I:420:ILE:HG23	2.47	0.50
3:K:93:ALA:HB2	3:K:103:TRP:CD1	2.46	0.49
1:A:457:ASP:OD2	1:A:467:ARG:NH2	2.45	0.49
1:E:361:PHE:N	1:E:393:ARG:O	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:457:ASP:OD2	1:E:467:ARG:NH2	2.44	0.49
4:H:81:GLU:OE2	4:H:81:GLU:N	2.45	0.49
1:E:204:VAL:HG11	1:E:210:PHE:HE1	1.74	0.49
1:I:495:ALA:HB2	2:J:631:TRP:CH2	2.47	0.49
4:L:33:VAL:O	4:L:50:GLY:N	2.46	0.49
3:C:6:GLN:NE2	3:C:92:CYS:SG	2.81	0.49
1:I:382:PHE:O	1:I:420:ILE:HD12	2.13	0.49
1:E:390:LEU:HD23	1:E:391:PHE:CD2	2.48	0.48
1:I:104:MET:O	1:I:108:VAL:HG23	2.13	0.48
2:J:530:MET:O	2:J:534:SER:N	2.40	0.48
1:E:36:VAL:HG22	2:F:610:TRP:HE3	1.78	0.48
1:E:257:THR:OG1	1:E:375:SER:OG	2.07	0.48
1:I:303:THR:HG22	1:I:321(A):GLN:O	2.13	0.48
2:J:525:ALA:HA	2:J:526:ALA:HB3	1.94	0.48
2:B:538:THR:HG21	2:F:647:GLU:OE2	2.13	0.48
2:F:525:ALA:HA	2:F:526:ALA:HB3	1.95	0.48
3:K:4:LEU:O	3:K:6:GLN:NE2	2.46	0.48
1:E:36:VAL:HG22	2:F:610:TRP:CE3	2.49	0.48
1:I:457:ASP:OD2	1:I:467:ARG:NH2	2.47	0.48
3:K:44:ARG:NH2	4:L:4:LEU:O	2.46	0.48
3:C:93:ALA:HB2	3:C:103:TRP:CD1	2.49	0.48
1:E:129:LEU:N	1:E:191:TYR:O	2.40	0.48
1:I:34:LEU:HD11	2:J:619:LEU:HD13	1.94	0.47
1:I:55:ALA:O	1:I:216:HIS:N	2.44	0.47
2:F:617:ARG:CB	2:F:622:ILE:HG21	2.45	0.47
1:E:35:TRP:HB3	1:E:500:LYS:HZ3	1.80	0.47
1:E:75:VAL:HB	1:E:76:PRO:HD2	1.97	0.46
1:A:361:PHE:N	1:A:393:ARG:O	2.48	0.46
1:E:499:CYS:SG	1:E:500:LYS:N	2.88	0.46
4:L:54:ARG:NH1	4:L:58:ILE:HG23	2.31	0.46
4:D:33:VAL:HG11	4:D:71:PHE:CE2	2.51	0.46
1:A:495:ALA:HB2	2:B:631:TRP:CH2	2.48	0.46
1:I:187:ASN:OD1	4:L:28:SER:N	2.44	0.46
3:C:54:ASN:OD1	3:C:55:GLY:N	2.49	0.46
4:D:36:TYR:CE1	4:D:46:LEU:HD13	2.51	0.45
2:B:525:ALA:HA	2:B:526:ALA:HB3	1.98	0.45
1:I:494:VAL:HG21	2:J:642:ILE:HG21	1.98	0.45
1:E:356:LYS:HA	1:E:397:ALA:HB3	1.99	0.45
1:I:383:PHE:CD2	1:I:420:ILE:HD13	2.52	0.45
1:A:32:GLU:N	1:A:32:GLU:OE1	2.51	0.44
2:B:530:MET:O	2:B:533:ALA:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:298:ARG:NH1	1:E:381:GLU:OE2	2.50	0.44
1:I:179:LEU:HD21	1:I:419:ARG:NH2	2.32	0.44
1:A:142:ILE:HG23	1:A:145:MET:HB2	1.99	0.44
1:A:350:LYS:NZ	1:A:397:ALA:HB2	2.33	0.44
3:C:100(D):PRO:O	4:D:32:ARG:NH2	2.51	0.44
1:E:116:LEU:HD21	1:E:202:THR:CB	2.47	0.44
1:E:383:PHE:HA	1:E:420:ILE:HD12	1.99	0.44
3:K:33:VAL:HG21	3:K:100(H):TYR:HE1	1.81	0.44
3:C:65:ASP:OD1	1:I:306:SER:OG	2.27	0.44
1:I:120:VAL:HG13	1:I:203:GLN:NE2	2.32	0.44
1:I:75:VAL:HB	1:I:76:PRO:HD3	2.00	0.44
2:J:606:THR:HG21	2:J:646:LEU:HD22	1.99	0.44
1:A:172:LYS:HG2	1:A:307:ILE:HD12	2.00	0.44
1:A:428:GLN:NE2	3:C:53:TYR:O	2.51	0.44
2:F:530:MET:O	2:F:533:ALA:N	2.51	0.44
3:G:93:ALA:HB2	3:G:103:TRP:CD1	2.53	0.44
4:H:47:VAL:HG13	4:H:62:PHE:CD2	2.53	0.44
1:I:495:ALA:HB1	2:J:623:TRP:CZ3	2.53	0.43
3:C:98:TYR:OH	3:C:100(B):ASP:O	2.27	0.43
1:E:225:ILE:HG23	1:E:485:LYS:O	2.18	0.43
2:F:532:ALA:O	2:F:534:SER:N	2.51	0.43
1:I:381:GLU:HB3	1:I:420:ILE:HD11	2.00	0.43
1:A:116:LEU:HD11	1:A:434:MET:HE2	2.01	0.43
2:B:586:TYR:OH	2:B:590:GLN:OE1	2.37	0.43
1:I:179:LEU:HD21	1:I:419:ARG:CZ	2.48	0.43
2:J:606:THR:HG21	2:J:646:LEU:CD2	2.49	0.43
4:D:25:SER:OG	4:D:69:THR:OG1	2.17	0.43
1:E:32:GLU:N	1:E:32:GLU:OE1	2.52	0.42
1:A:55:ALA:O	1:A:216:HIS:N	2.46	0.42
1:E:55:ALA:O	1:E:216:HIS:N	2.52	0.42
3:K:82(C):LEU:HD11	3:K:111:VAL:CG2	2.44	0.42
1:E:50:THR:O	1:E:103:GLN:NE2	2.49	0.42
1:A:55:ALA:N	1:A:74:CYS:SG	2.93	0.41
1:E:266:ALA:HB2	1:E:287:HIS:HD2	1.85	0.41
1:I:270:ILE:HG22	1:I:288:LEU:HA	2.03	0.41
1:A:128:THR:HG22	1:A:129:LEU:H	1.84	0.41
1:A:256:SER:O	1:A:476:ASN:ND2	2.54	0.41
1:E:74:CYS:O	1:E:75:VAL:HG22	2.20	0.41
1:I:41:GLY:N	1:I:491:PRO:O	2.54	0.41
1:I:356:LYS:HA	1:I:397:ALA:HB3	2.02	0.41
1:E:142:ILE:HG23	1:E:145:MET:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:116:LEU:HD23	1:E:116:LEU:O	2.20	0.41
1:I:163:THR:O	1:I:165:LEU:N	2.54	0.41
1:E:121:LYS:HG2	1:E:202:THR:HG22	2.03	0.40
1:A:125:LEU:HD22	1:A:193:LEU:HD11	2.02	0.40
1:A:172:LYS:CG	1:A:307:ILE:HD12	2.51	0.40
1:A:495:ALA:HB1	2:B:623:TRP:CH2	2.56	0.40
3:C:3:GLN:O	3:C:4:LEU:HD12	2.21	0.40
1:I:32:GLU:OE1	1:I:32:GLU:N	2.54	0.40
1:I:104:MET:CE	1:I:481:LEU:HD11	2.49	0.40
2:J:608:VAL:HG21	2:J:645:LEU:HB3	2.02	0.40
1:I:33:ASN:O	1:I:34:LEU:HD22	2.21	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	442/456 (97%)	411 (93%)	30 (7%)	1 (0%)	47	81
1	E	442/456 (97%)	413 (93%)	27 (6%)	2 (0%)	29	68
1	I	442/456 (97%)	407 (92%)	32 (7%)	3 (1%)	22	62
2	B	122/126 (97%)	112 (92%)	9 (7%)	1 (1%)	19	60
2	F	122/126 (97%)	110 (90%)	11 (9%)	1 (1%)	19	60
2	J	122/126 (97%)	110 (90%)	11 (9%)	1 (1%)	19	60
3	C	125/127 (98%)	120 (96%)	5 (4%)	0	100	100
3	G	125/127 (98%)	121 (97%)	4 (3%)	0	100	100
3	K	125/127 (98%)	121 (97%)	4 (3%)	0	100	100
4	D	106/108 (98%)	98 (92%)	8 (8%)	0	100	100
4	H	106/108 (98%)	102 (96%)	4 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	L	106/108 (98%)	102 (96%)	4 (4%)	0	100	100
All	All	2385/2451 (97%)	2227 (93%)	149 (6%)	9 (0%)	38	72

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	I	166	ARG
1	I	75	VAL
1	I	164	GLU
1	A	75	VAL
2	B	526	ALA
2	F	526	ALA
2	J	526	ALA
1	E	185	ASP
1	E	75	VAL

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	406/410 (99%)	406 (100%)	0	100	100
1	E	406/410 (99%)	405 (100%)	1 (0%)	93	96
1	I	406/410 (99%)	406 (100%)	0	100	100
2	B	108/108 (100%)	108 (100%)	0	100	100
2	F	108/108 (100%)	108 (100%)	0	100	100
2	J	108/108 (100%)	108 (100%)	0	100	100
3	C	107/107 (100%)	107 (100%)	0	100	100
3	G	107/107 (100%)	106 (99%)	1 (1%)	78	87
3	K	107/107 (100%)	106 (99%)	1 (1%)	78	87
4	D	91/91 (100%)	91 (100%)	0	100	100
4	H	91/91 (100%)	91 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	L	91/91 (100%)	91 (100%)	0	100	100
All	All	2136/2148 (99%)	2133 (100%)	3 (0%)	93	96

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	49	LYS
3	G	19	LYS
3	K	19	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	287	HIS
1	E	357	ASN
1	E	425	ASN
1	E	428	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	3
1	I	3
1	E	3
2	J	1
2	F	1
2	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	J	548:THR	C	570:VAL	N	20.25
1	F	548:THR	C	570:VAL	N	20.17
1	B	548:THR	C	570:VAL	N	19.86
1	A	147:ASN	C	157:CYS	N	3.52
1	I	147:ASN	C	157:CYS	N	3.47
1	E	309:ILE	C	312:GLY	N	3.43
1	A	309:ILE	C	312:GLY	N	3.41
1	E	147:ASN	C	157:CYS	N	3.40
1	E	359:THR	C	361:PHE	N	3.35
1	I	359:THR	C	361:PHE	N	3.27
1	A	359:THR	C	361:PHE	N	3.20
1	I	309:ILE	C	312:GLY	N	3.17

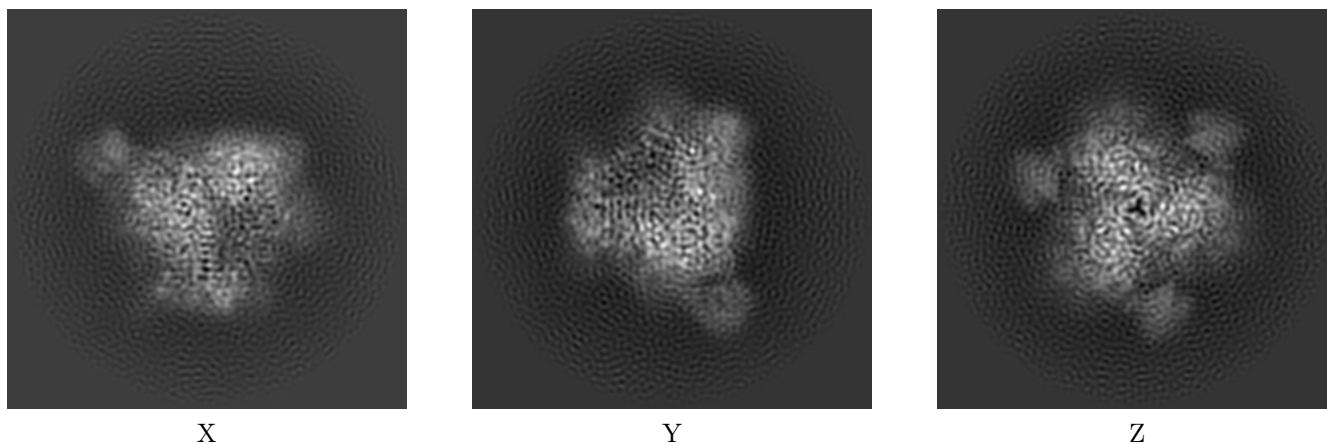
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-40853. These allow visual inspection of the internal detail of the map and identification of artifacts.

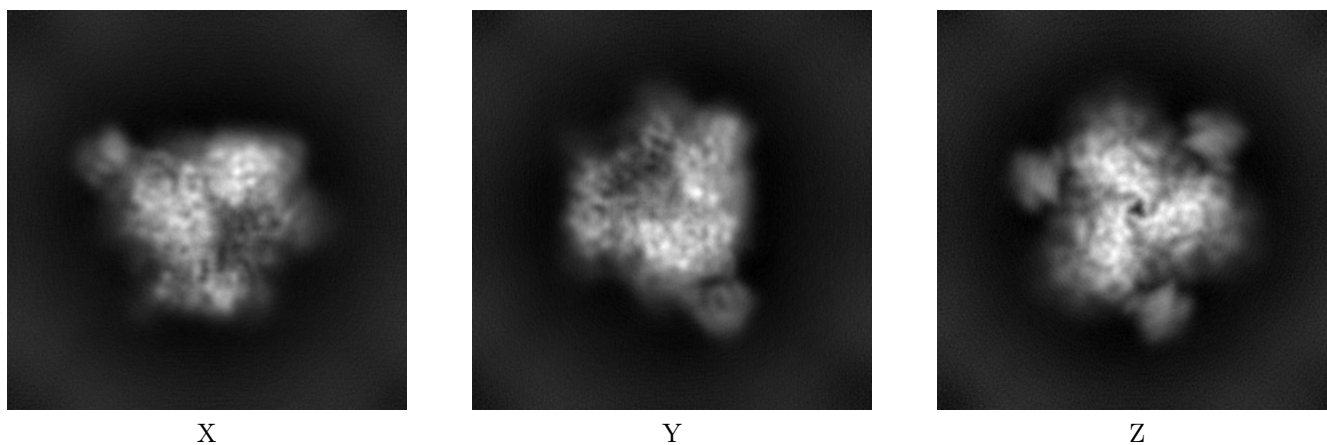
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



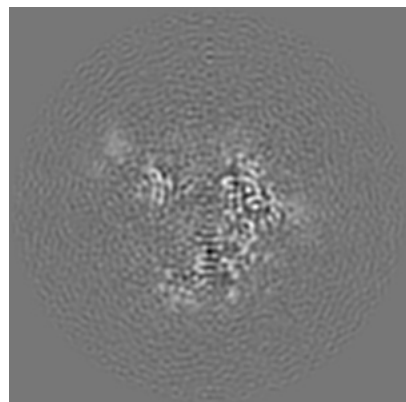
6.1.2 Raw map



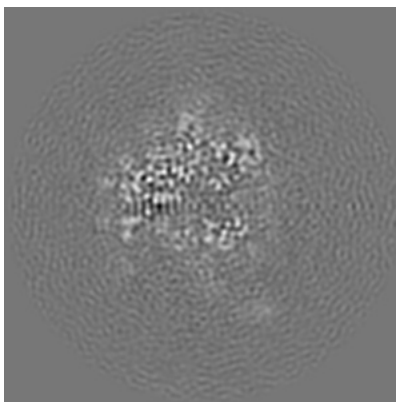
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

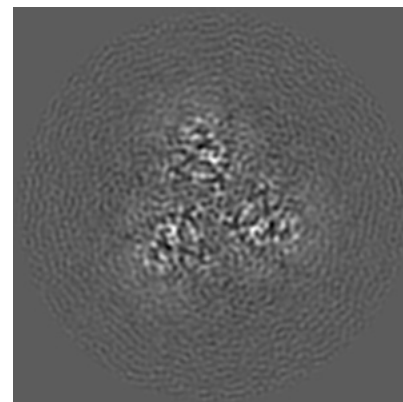
6.2.1 Primary map



X Index: 150

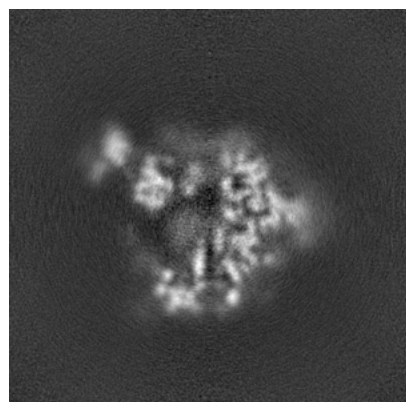


Y Index: 150

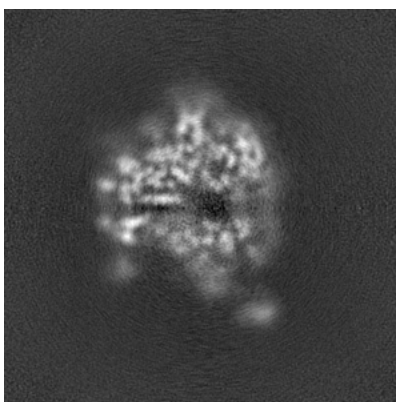


Z Index: 150

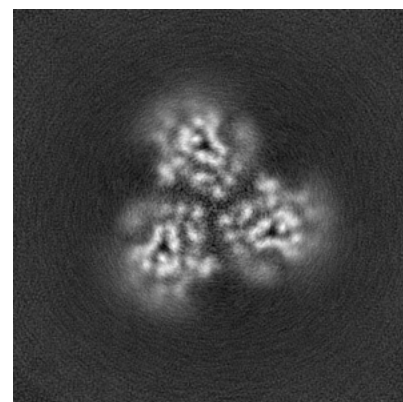
6.2.2 Raw map



X Index: 150



Y Index: 150

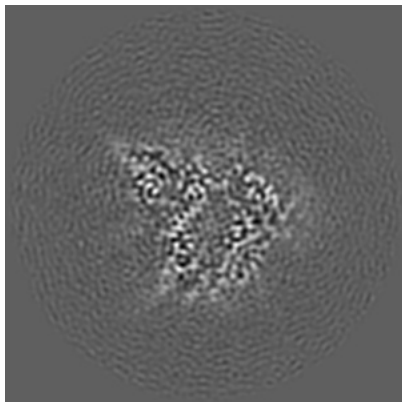


Z Index: 150

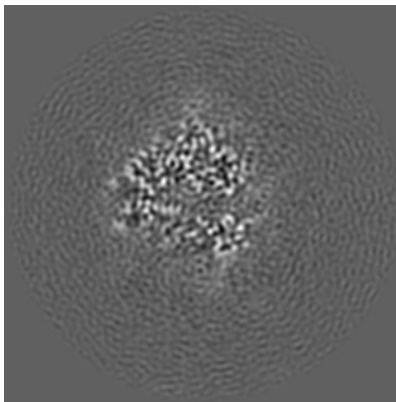
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

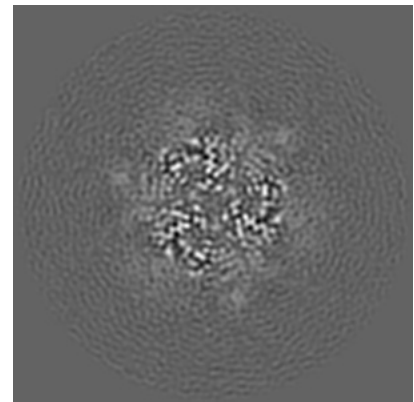
6.3.1 Primary map



X Index: 137

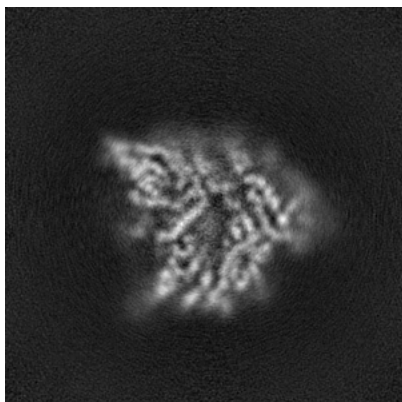


Y Index: 144

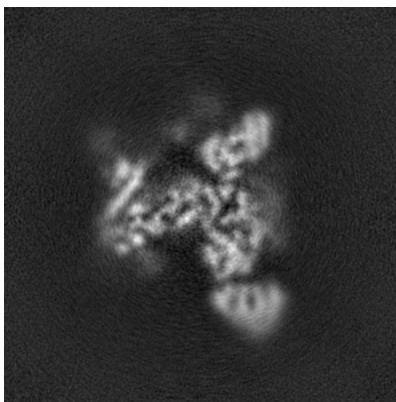


Z Index: 161

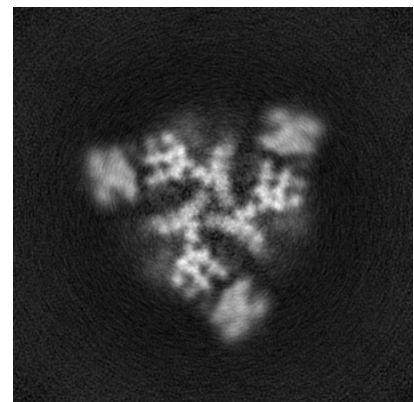
6.3.2 Raw map



X Index: 137



Y Index: 170

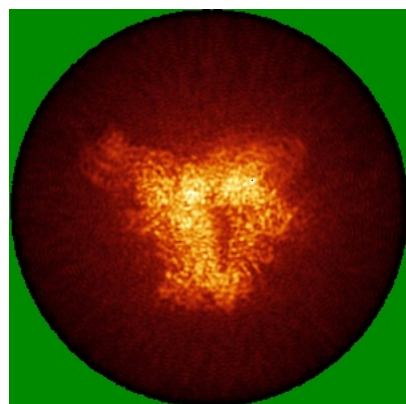


Z Index: 179

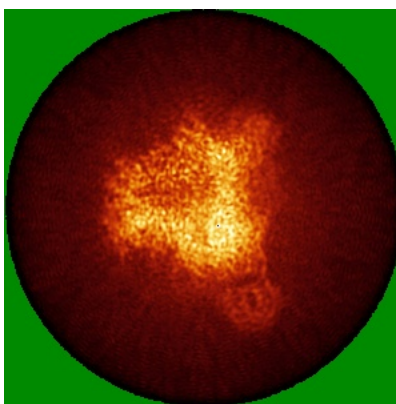
The images above show the largest variance slices of the map in three orthogonal directions.

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

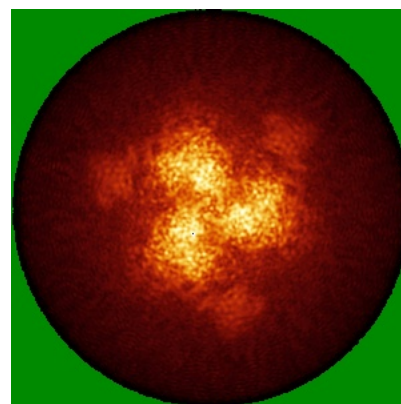
6.4.1 Primary map



X

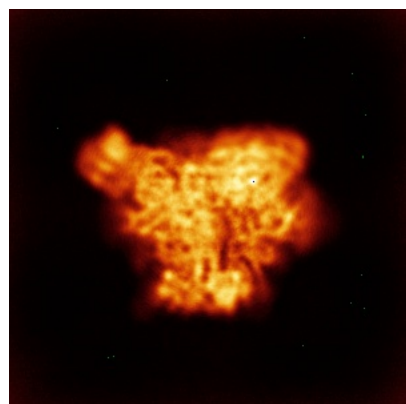


Y

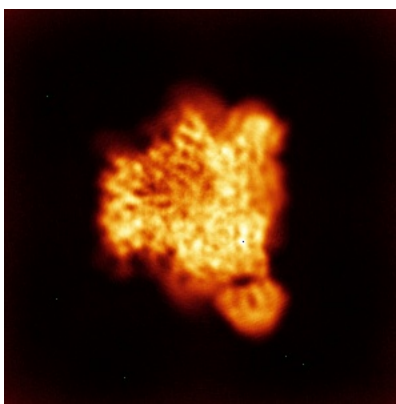


Z

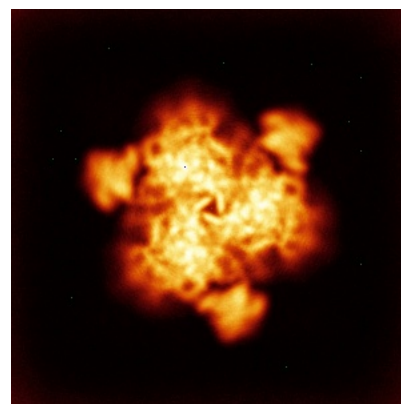
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

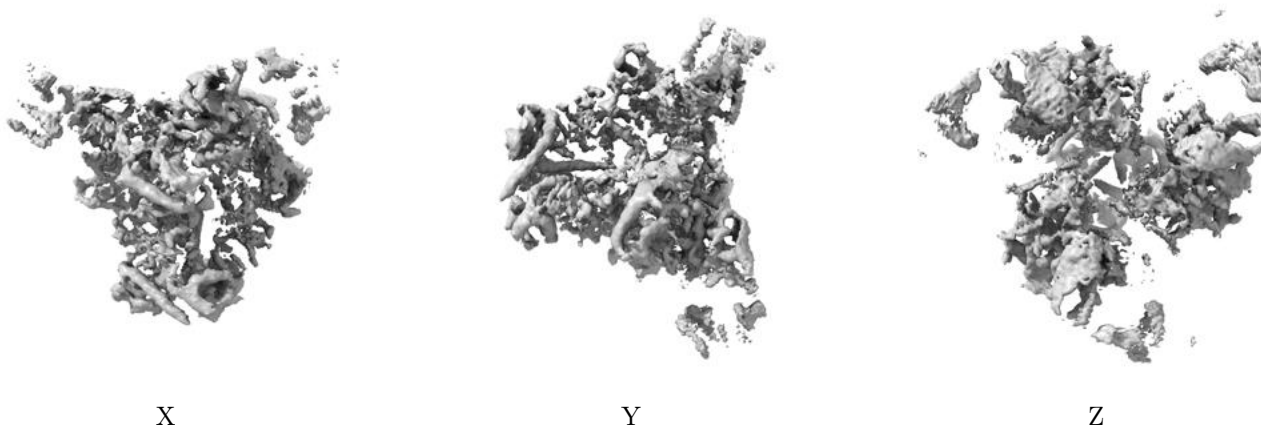
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.194. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

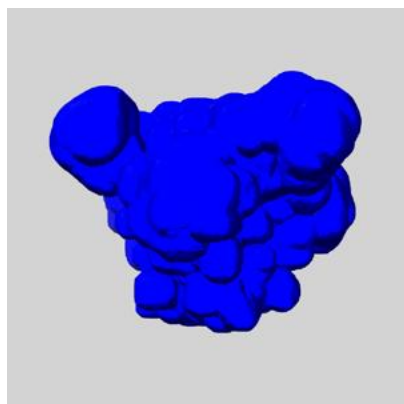
6.6 Mask visualisation [i](#)

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

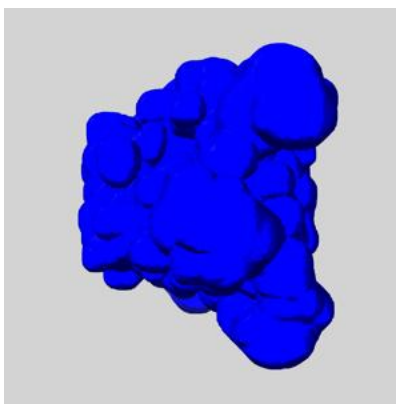
A mask typically either:

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

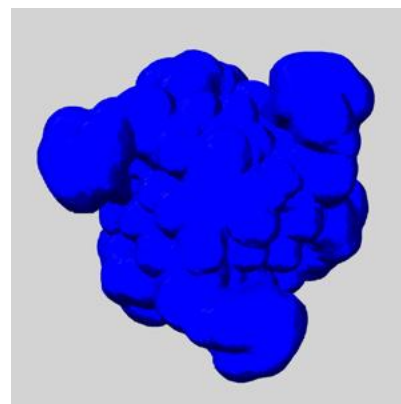
6.6.1 emd_40853_msk_1.map [i](#)



X



Y

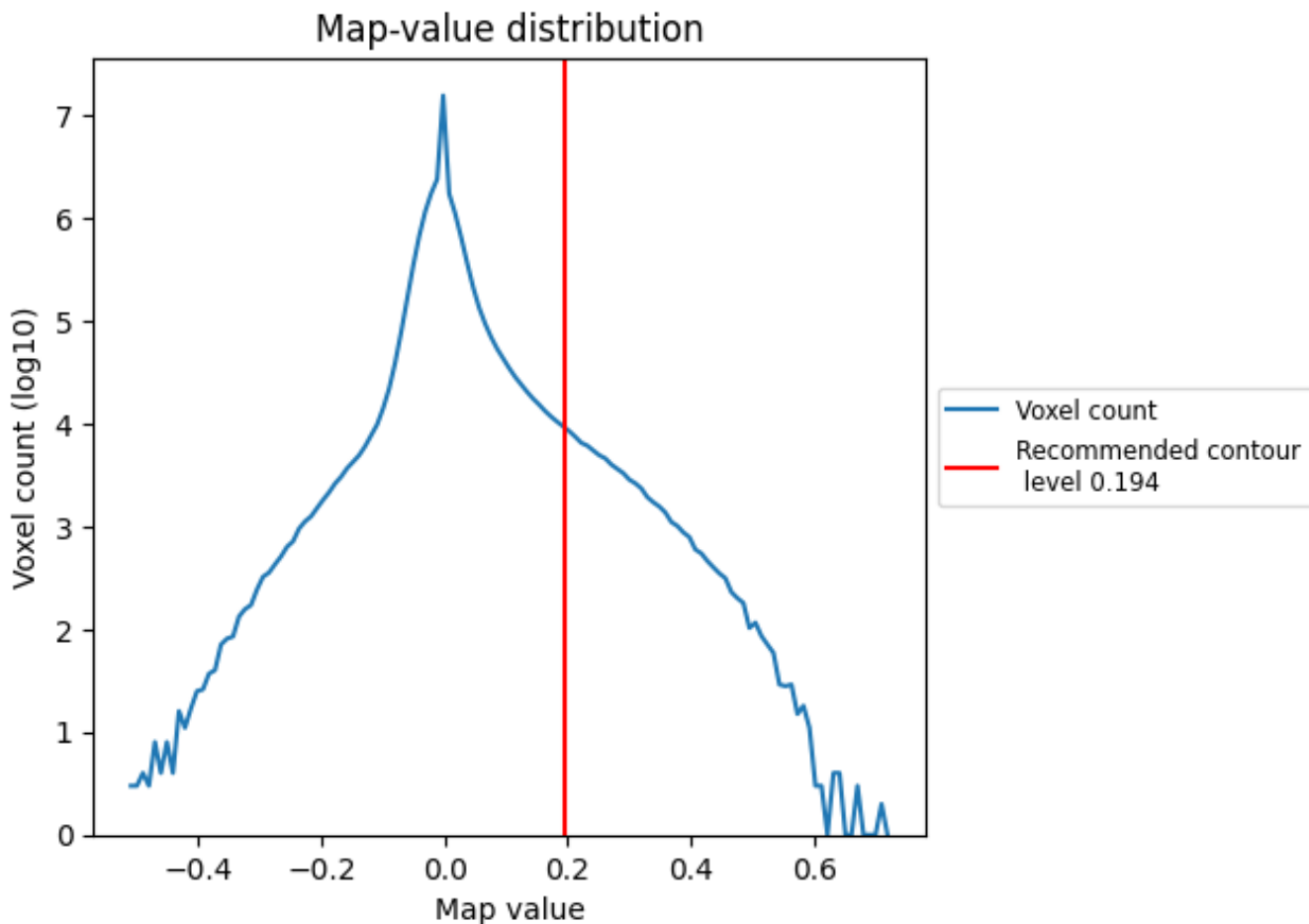


Z

7 Map analysis [i](#)

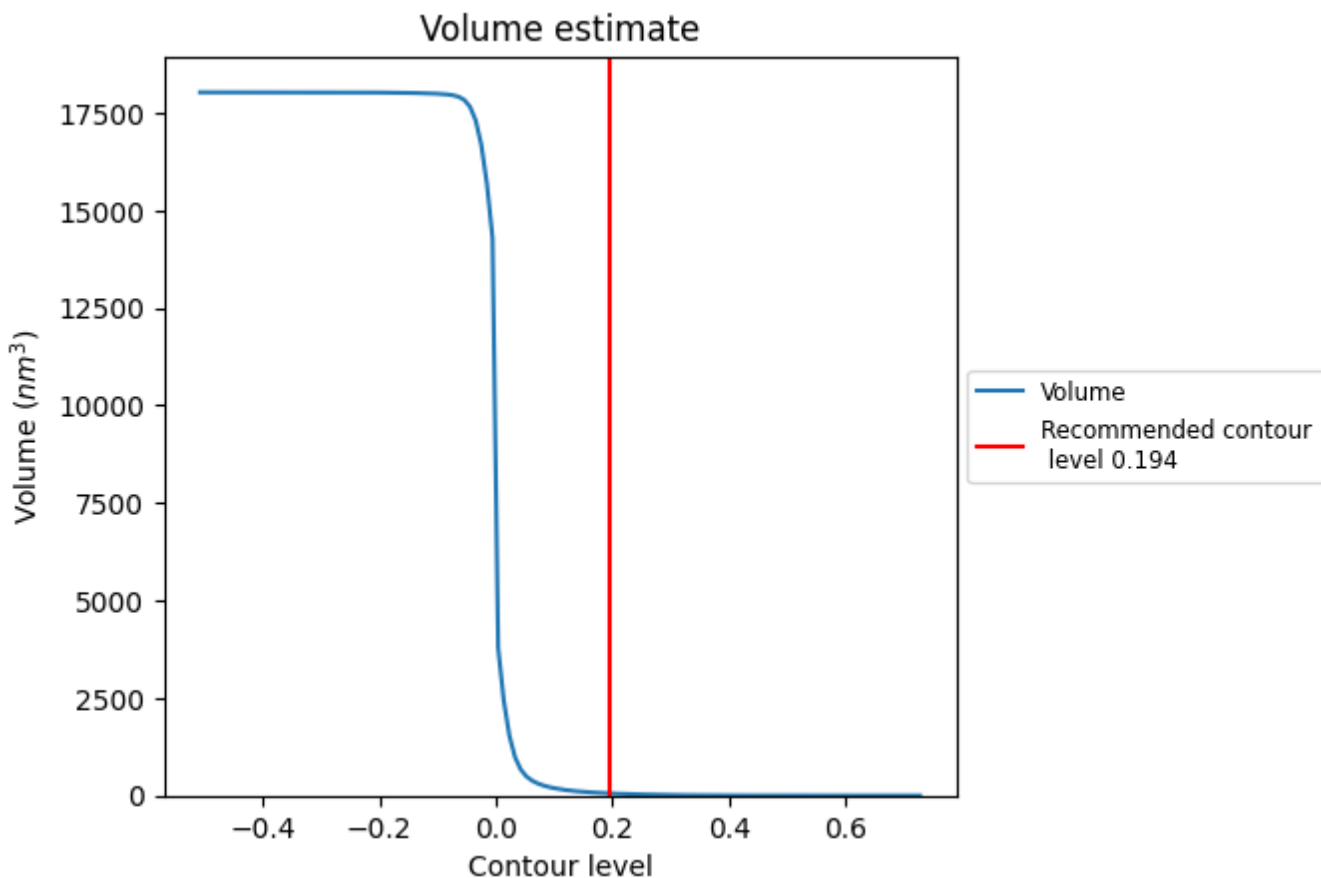
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

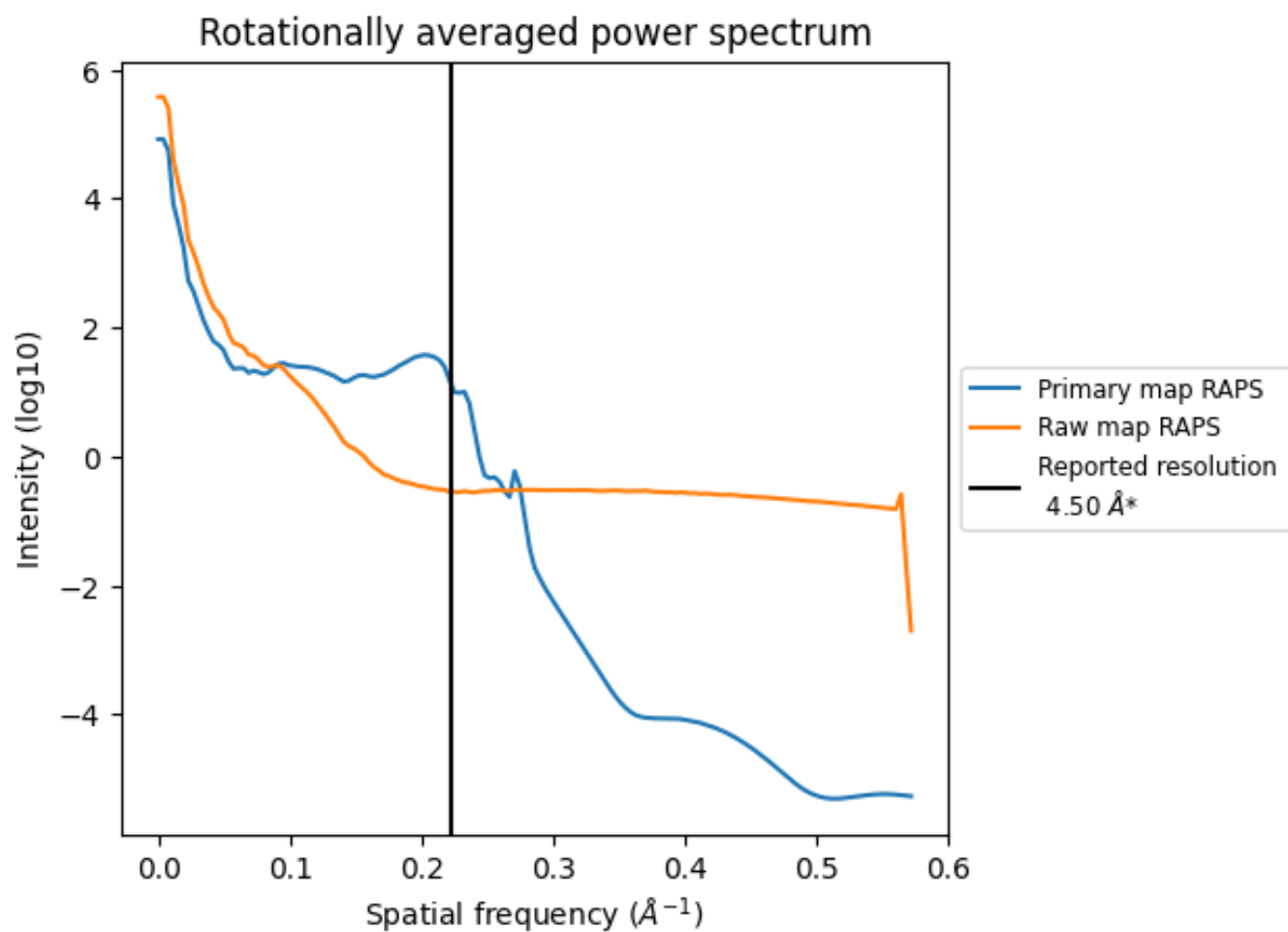
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 57 nm³; this corresponds to an approximate mass of 51 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

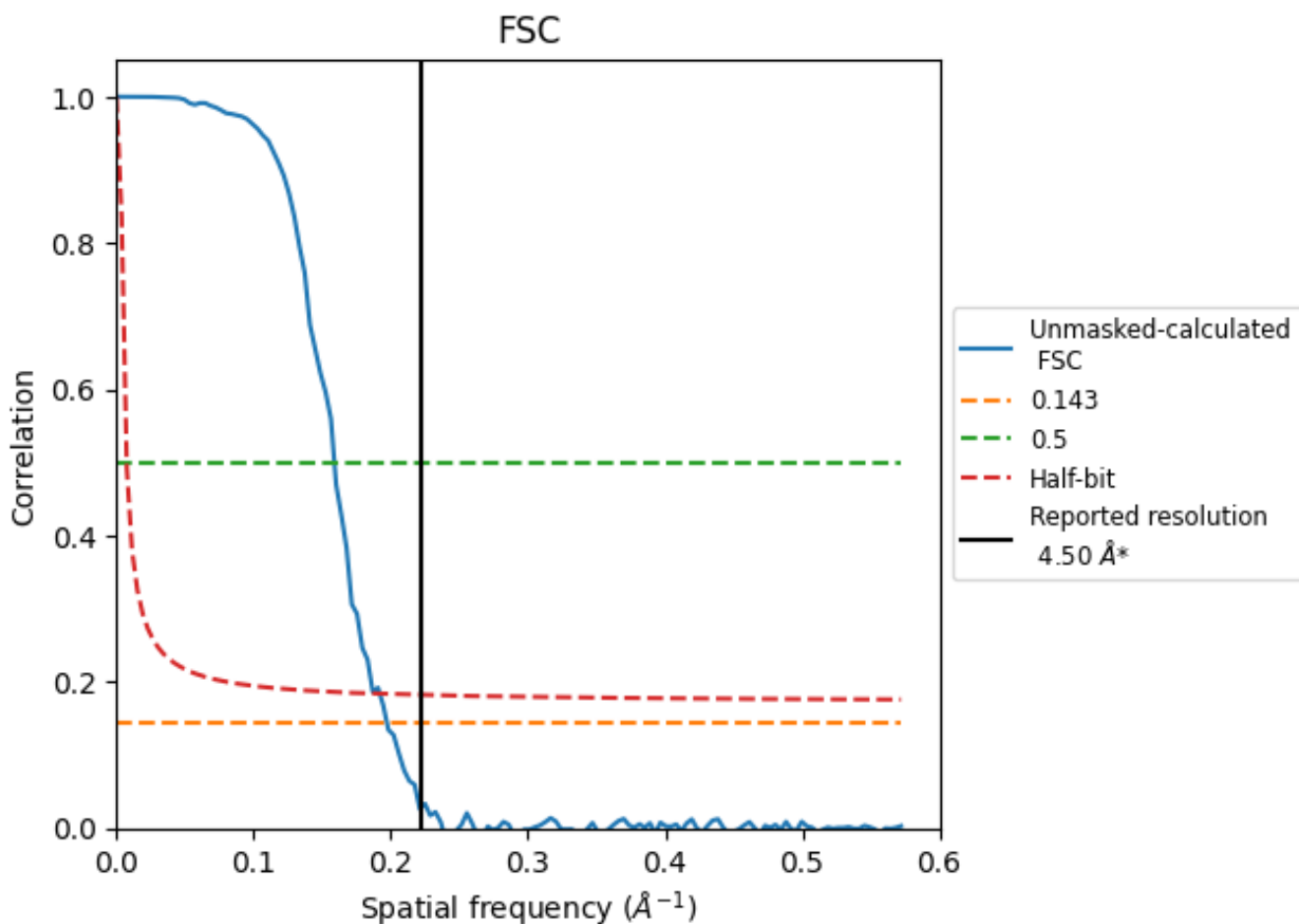


*Reported resolution corresponds to spatial frequency of 0.222 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.222 Å⁻¹

8.2 Resolution estimates [i](#)

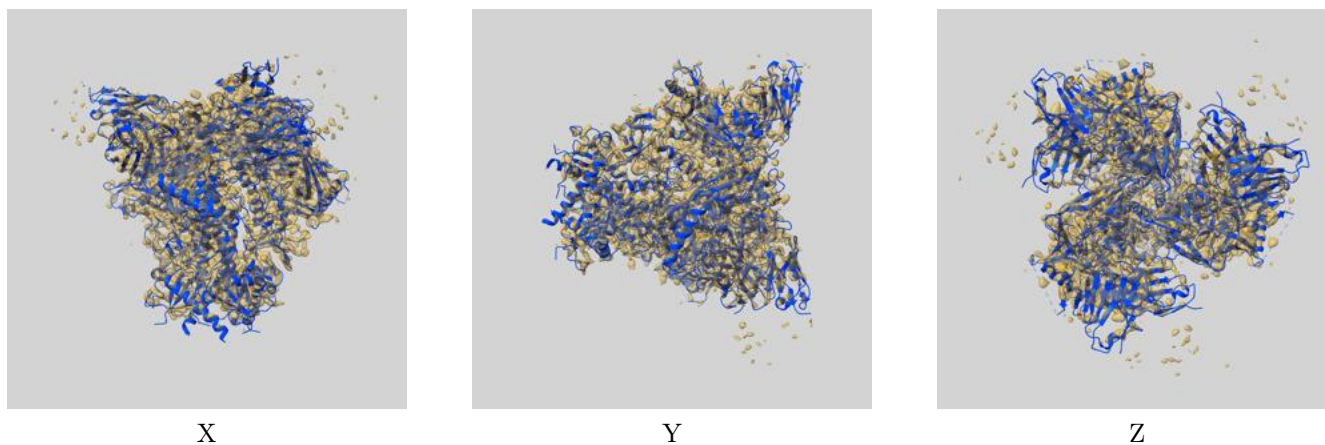
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.50	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.07	6.29	5.21

*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 5.07 differs from the reported value 4.5 by more than 10 %

9 Map-model fit [i](#)

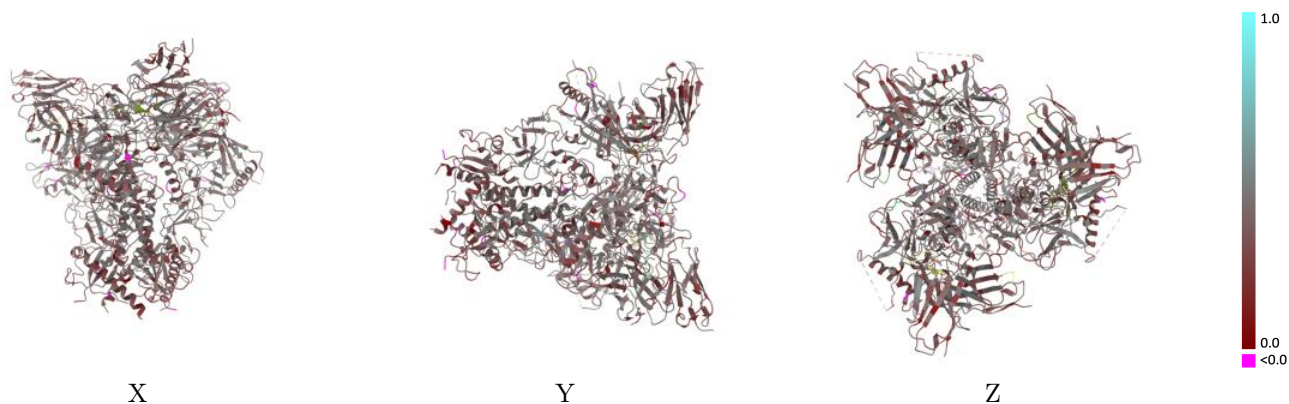
This section contains information regarding the fit between EMDB map EMD-40853 and PDB model 8SXI. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



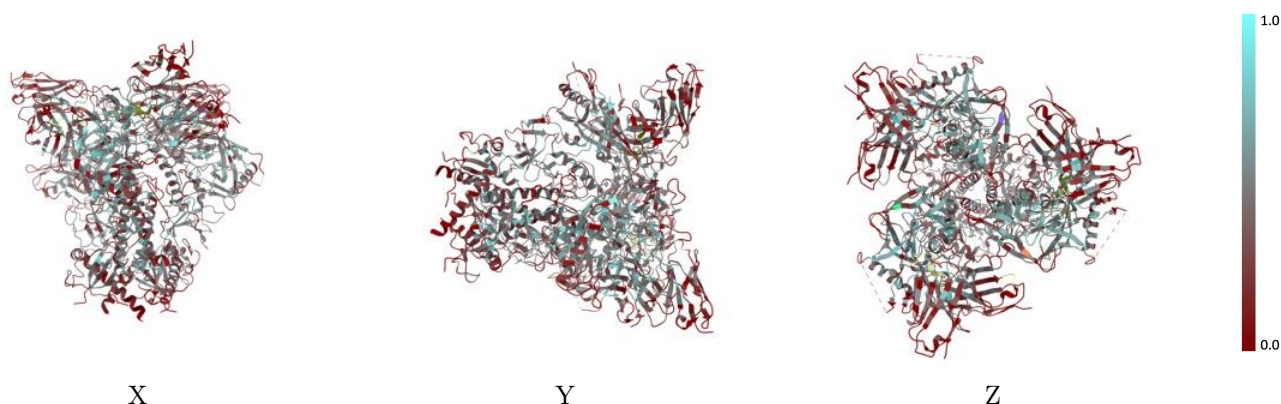
The images above show the 3D surface view of the map at the recommended contour level 0.194 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



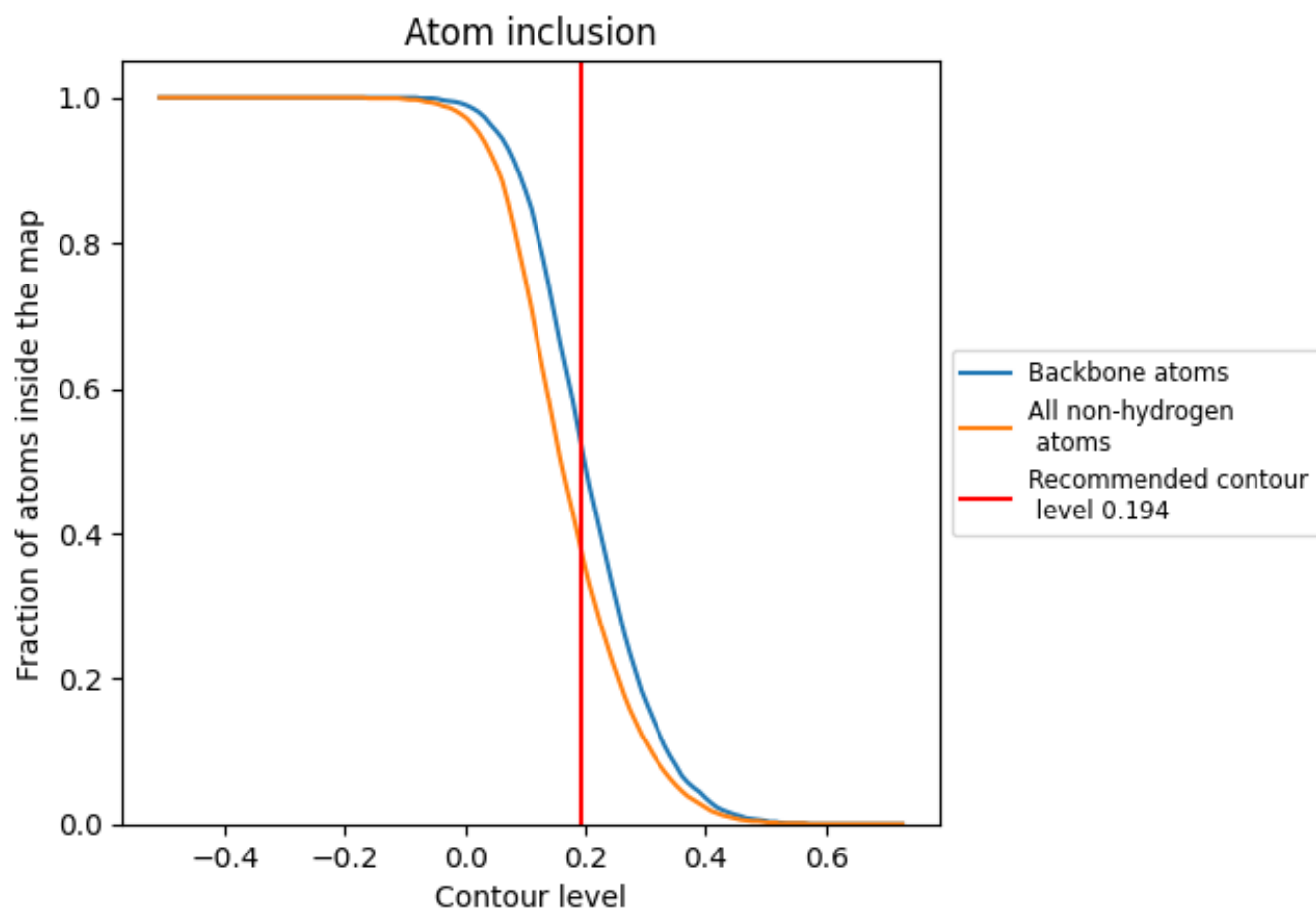
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.194).

9.4 Atom inclusion [i](#)



At the recommended contour level, 52% of all backbone atoms, 37% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.194) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.3740	0.3710
A	0.4070	0.3790
B	0.3150	0.3510
C	0.3650	0.3750
D	0.2970	0.3570
E	0.4170	0.3800
F	0.3220	0.3520
G	0.3680	0.3730
H	0.2900	0.3590
I	0.4090	0.3790
J	0.3120	0.3470
K	0.3650	0.3730
L	0.2860	0.3610

