



Full wwPDB EM Validation Report ⓘ

Feb 27, 2025 – 09:04 PM EST

PDB ID : 9CBN
EMDB ID : EMD-45427
Title : HAstV1 spike in complex with neutralizing Fabs 3H4 and 3B4
Authors : Lanning, S.; DuBois, R.M.; Balasco Serrao, V.H.
Deposited on : 2024-06-19
Resolution : 3.33 Å (reported)
Based on initial models : ., 5EWO

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev117
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.41.4

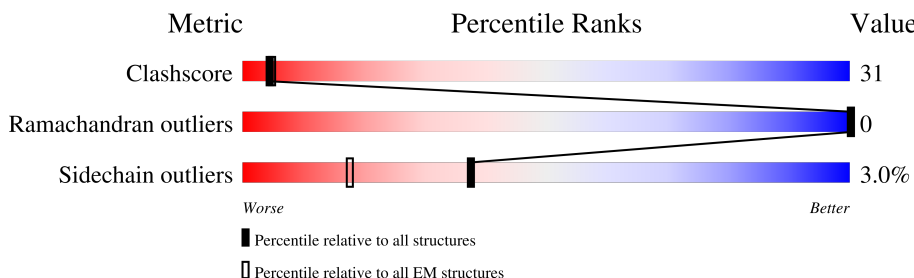
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.33 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	225	
2	B	214	
3	C	228	
3	D	228	
4	E	228	
4	G	228	
5	F	217	
5	H	217	

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Mol	Chain	Length	Quality of chain
6	I	3	<div><div></div><div>33%</div><div>33%</div><div>33%</div></div>
6	J	3	<div><div></div><div>33%</div><div>33%</div><div>33%</div></div>

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 10967 atoms, of which 3143 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 HAsV1 neutralizing Fab 3B4 heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	104	Total	C	N	O	S	0	0
			773	501	125	142	5		

- Molecule 2 is a protein called HAsV1 neutralizing Fab 3B4 kappa chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	77	Total	C	N	O	S	0	0
			546	351	93	99	3		

- Molecule 3 is a protein called Structural protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	C	212	Total	C	H	N	O	S	4	0
			3187	1053	1570	264	292	8		
3	D	212	Total	C	H	N	O	S	5	0
			3216	1065	1573	268	302	8		

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	428	MET	-	initiating methionine	UNP Q82452
C	646	ALA	-	expression tag	UNP Q82452
C	647	ALA	-	expression tag	UNP Q82452
C	648	ALA	-	expression tag	UNP Q82452
C	649	GLU	-	expression tag	UNP Q82452
C	650	LEU	-	expression tag	UNP Q82452
C	651	ALA	-	expression tag	UNP Q82452
C	652	LEU	-	expression tag	UNP Q82452
C	653	VAL	-	expression tag	UNP Q82452
C	654	PRO	-	expression tag	UNP Q82452
C	655	ARG	-	expression tag	UNP Q82452
D	428	MET	-	initiating methionine	UNP Q82452
D	646	ALA	-	expression tag	UNP Q82452

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Chain	Residue	Modelled	Actual	Comment	Reference
D	647	ALA	-	expression tag	UNP Q82452
D	648	ALA	-	expression tag	UNP Q82452
D	649	GLU	-	expression tag	UNP Q82452
D	650	LEU	-	expression tag	UNP Q82452
D	651	ALA	-	expression tag	UNP Q82452
D	652	LEU	-	expression tag	UNP Q82452
D	653	VAL	-	expression tag	UNP Q82452
D	654	PRO	-	expression tag	UNP Q82452
D	655	ARG	-	expression tag	UNP Q82452

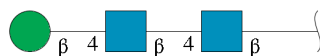
- Molecule 4 is a protein called HAsV1 neutralizing Fab 3H4 heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	115	Total	C	N	O	S	1	0
			890	577	144	166	3		
4	G	119	Total	C	N	O	S	0	0
			880	571	142	164	3		

- Molecule 5 is a protein called HAsV1 neutralizing Fab 3H4 lambda chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	98	Total	C	N	O	S	0	0
			694	446	120	126	2		
5	H	103	Total	C	N	O	S	0	0
			695	448	118	127	2		

- Molecule 6 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms					AltConf	Trace
6	I	3	Total	C	N	O		0	0
			39	22	2	15			
6	J	3	Total	C	N	O		0	0
			33	21	2	10			

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).

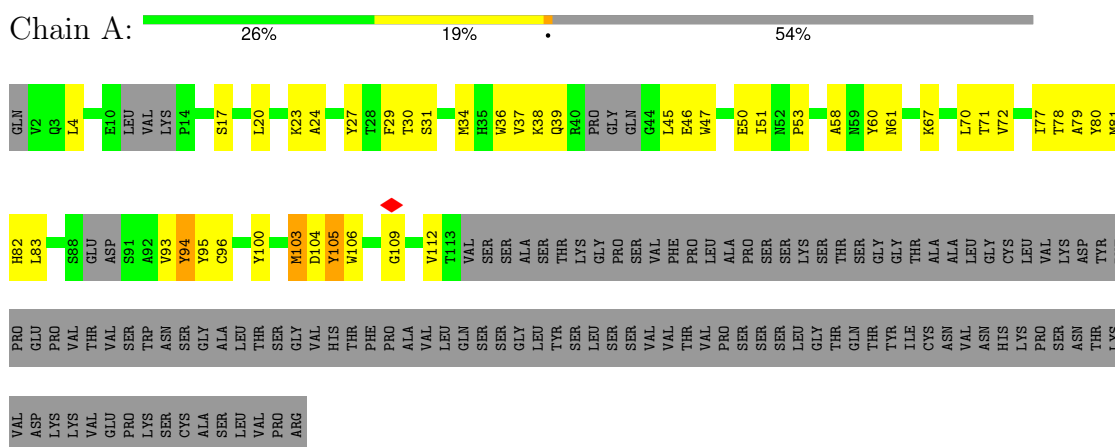


Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
7	A	1	14	8	1	5	0

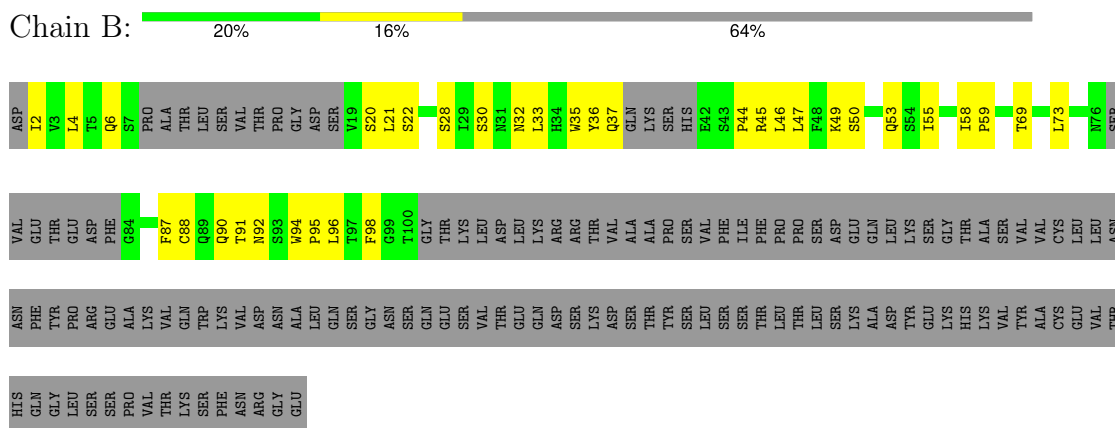
3 Residue-property plots

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.

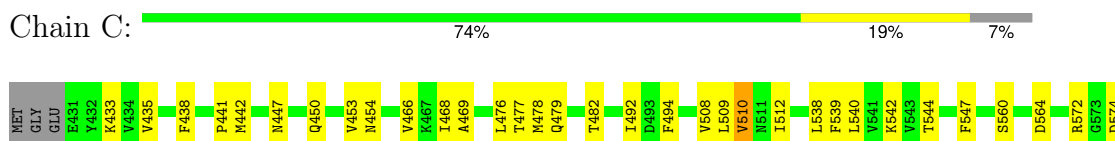
• Molecule 1: HAsTV1 neutralizing Fab 3B4 heavy chain



• Molecule 2: HAsTV1 neutralizing Fab 3B4 kappa chain



• Molecule 3: Structural protein

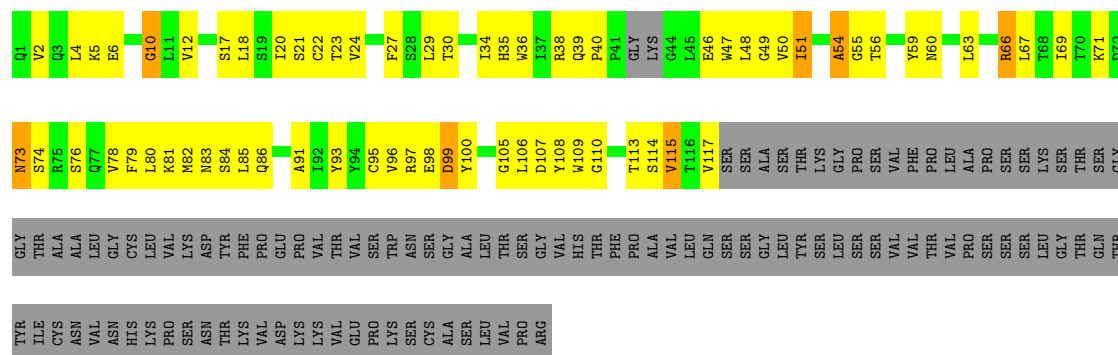




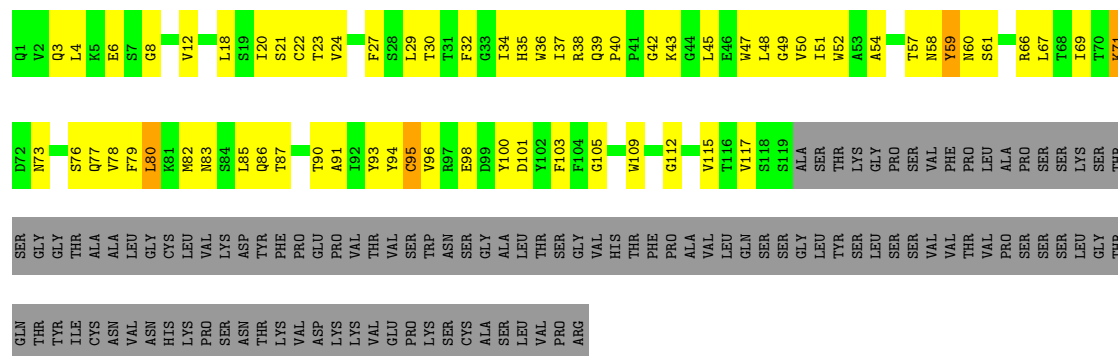
• Molecule 3: Structural protein



• Molecule 4: HAsT V1 neutralizing Fab 3H4 heavy chain

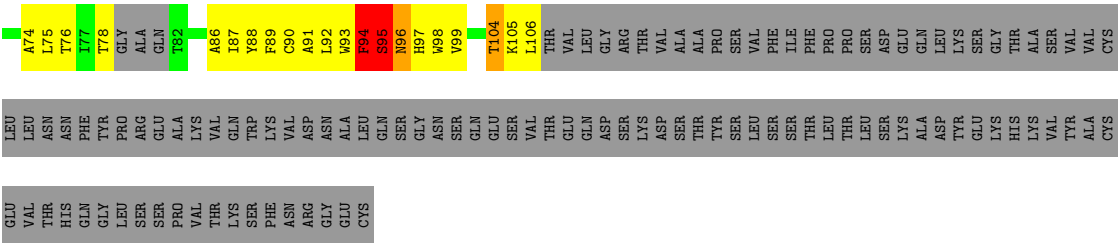


• Molecule 4: HAsT V1 neutralizing Fab 3H4 heavy chain

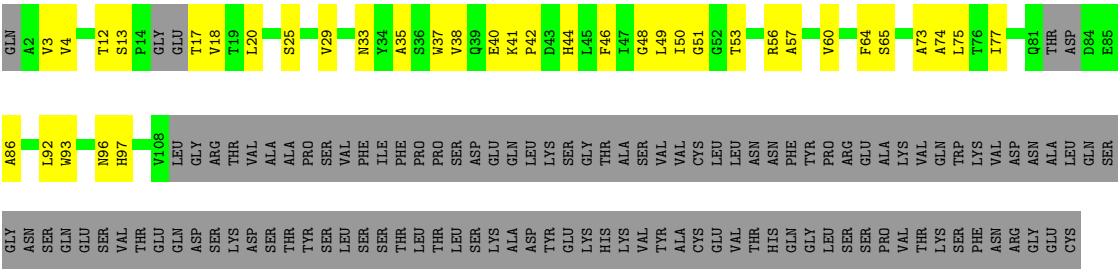


• Molecule 5: HAsT V1 neutralizing Fab 3H4 lambda chain

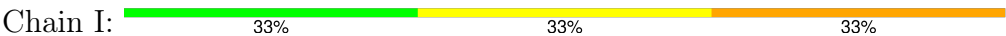




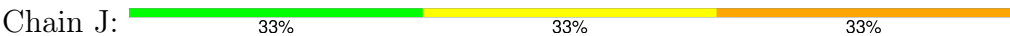
• Molecule 5: HAsV1 neutralizing Fab 3H4 lambda chain



• Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



• Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	163237	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	32.26	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	0.363	Depositor
Minimum map value	-0.277	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.0221	Depositor
Map size (Å)	284.69, 284.69, 284.69	wwPDB
Map dimensions	686, 686, 686	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.415, 0.415, 0.415	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.55	0/796	1.25	11/1084 (1.0%)
2	B	0.39	0/557	0.52	0/755
3	C	0.34	0/1697	0.56	1/2320 (0.0%)
3	D	0.36	0/1727	0.56	3/2361 (0.1%)
4	E	0.50	1/913 (0.1%)	0.77	4/1246 (0.3%)
4	G	0.30	0/904	0.85	4/1239 (0.3%)
5	F	0.44	0/707	1.23	6/964 (0.6%)
5	H	0.34	0/711	0.51	0/977
All	All	0.40	1/8012 (0.0%)	0.78	29/10946 (0.3%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	10	GLY	C-N	10.39	1.57	1.34

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	F	95	SER	N-CA-CB	-19.38	81.42	110.50
1	A	94	TYR	N-CA-C	18.50	160.94	111.00
5	F	94	PHE	CB-CA-C	16.85	144.10	110.40
4	G	60	ASN	CB-CA-C	-15.78	78.85	110.40
5	F	95	SER	CB-CA-C	13.04	134.87	110.10
1	A	105	TYR	N-CA-CB	-12.71	87.72	110.60
4	G	61	SER	N-CA-CB	-11.65	93.02	110.50
5	F	96	ASN	N-CA-CB	-11.17	90.50	110.60
1	A	94	TYR	N-CA-CB	-10.66	91.40	110.60
5	F	94	PHE	N-CA-C	-10.65	82.24	111.00
1	A	95	TYR	N-CA-CB	-10.58	91.55	110.60
4	E	54	ALA	CB-CA-C	-10.27	94.70	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	103	MET	N-CA-C	10.10	138.26	111.00
4	G	60	ASN	N-CA-C	-9.65	84.94	111.00
1	A	103	MET	CB-CA-C	-7.92	94.56	110.40
1	A	104	ASP	CB-CA-C	7.56	125.53	110.40
1	A	103	MET	N-CA-CB	7.48	124.06	110.60
1	A	95	TYR	CB-CA-C	-7.00	96.40	110.40
1	A	104	ASP	N-CA-CB	-6.92	98.14	110.60
1	A	105	TYR	N-CA-C	6.86	129.51	111.00
3	C	510	VAL	N-CA-C	-6.63	93.10	111.00
4	G	59	TYR	CB-CA-C	6.39	123.19	110.40
3	D	450	GLN	CB-CA-C	-5.74	98.93	110.40
4	E	51	ILE	CB-CA-C	5.72	123.03	111.60
4	E	115	VAL	N-CA-C	-5.67	95.69	111.00
3	D	575	THR	C-N-CA	5.64	135.79	121.70
4	E	55	GLY	N-CA-C	5.60	127.10	113.10
5	F	96	ASN	N-CA-C	5.22	125.10	111.00
3	D	576	TYR	N-CA-CB	-5.02	101.56	110.60

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	773	0	664	73	0
2	B	546	0	470	54	0
3	C	1617	1570	1536	41	0
3	D	1643	1573	1558	52	0
4	E	890	0	841	91	0
4	G	880	0	805	85	0
5	F	694	0	649	53	0
5	H	695	0	614	41	0
6	I	39	0	34	3	0
6	J	33	0	22	2	0
7	A	14	0	13	0	0
All	All	7824	3143	7206	462	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 31.

All (462) 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:B:91:THR:HA	2:B:96:LEU:CD2	1.31	1.51
2:B:91:THR:CA	2:B:96:LEU:HD22	1.43	1.46
3:D:604:TRP:NE1	3:D:606:TRP:CD1	2.06	1.21
1:A:23:LYS:HG3	1:A:78:THR:HG22	1.15	1.14
1:A:30:THR:O	1:A:53:PRO:HG3	1.50	1.12
2:B:91:THR:CA	2:B:96:LEU:CD2	2.13	1.10
3:D:604:TRP:NE1	3:D:606:TRP:NE1	1.99	1.09
1:A:94:TYR:O	1:A:109:GLY:HA2	1.51	1.08
1:A:60:TYR:CE1	1:A:70:LEU:HG	1.89	1.07
4:G:35:HIS:HB2	4:G:96:VAL:HG23	1.29	1.07
1:A:23:LYS:CG	1:A:78:THR:HG22	1.86	1.05
3:D:433:LYS:CE	3:D:494:PHE:CE2	2.38	1.05
1:A:60:TYR:OH	1:A:70:LEU:N	1.88	1.04
3:D:433:LYS:HD3	3:D:494:PHE:CE2	1.91	1.04
4:E:40:PRO:CD	4:E:46:GLU:OE1	2.07	1.03
3:D:433:LYS:HE3	3:D:494:PHE:HE2	1.20	1.01
1:A:51:ILE:HD13	1:A:72:VAL:HG13	1.42	1.01
1:A:23:LYS:HG3	1:A:78:THR:CG2	1.89	1.01
3:D:445:ASN:ND2	3:D:481:PHE:CE1	2.29	1.01
4:G:38:ARG:HB3	4:G:48:LEU:HD21	1.44	0.98
1:A:94:TYR:HB2	1:A:109:GLY:HA3	1.44	0.96
3:D:433:LYS:HE3	3:D:494:PHE:CE2	1.99	0.96
1:A:38:LYS:HD2	1:A:93:VAL:HG22	1.48	0.96
5:H:35:ALA:HB3	5:H:53:THR:HG22	1.48	0.95
3:D:433:LYS:CE	3:D:494:PHE:HE2	1.75	0.95
3:D:433:LYS:CD	3:D:494:PHE:CE2	2.49	0.94
2:B:91:THR:CB	2:B:96:LEU:HD22	2.04	0.87
1:A:60:TYR:HE1	1:A:70:LEU:HG	1.37	0.86
1:A:81:MET:HE1	1:A:93:VAL:HG11	1.57	0.86
4:E:107:ASP:HA	5:F:48:GLY:HA3	1.57	0.86
3:D:445:ASN:ND2	3:D:481:PHE:HE1	1.72	0.85
4:E:67:LEU:HD11	4:E:80:LEU:HD11	1.60	0.84
4:E:35:HIS:HA	4:E:50:VAL:HG23	1.59	0.83
4:G:29:LEU:O	4:G:71:LYS:NZ	2.11	0.83
4:G:51:ILE:HD13	4:G:71:LYS:HB3	1.61	0.83
1:A:37:VAL:HG21	1:A:45:LEU:HD11	1.60	0.82
4:E:35:HIS:HB2	4:E:96:VAL:HG22	1.61	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:35:HIS:HB2	4:G:96:VAL:CG2	2.10	0.82
1:A:30:THR:O	1:A:53:PRO:CG	2.25	0.82
3:C:509:LEU:HD22	3:C:512:ILE:O	1.80	0.81
4:G:20:ILE:HD11	4:G:80:LEU:HD22	1.62	0.80
4:G:35:HIS:NE2	4:G:98:GLU:OE2	2.14	0.80
4:E:59:TYR:CE1	4:E:69:ILE:HG12	2.17	0.80
2:B:91:THR:HA	2:B:96:LEU:HD23	1.61	0.79
4:G:29:LEU:HD12	4:G:76:SER:HA	1.65	0.79
1:A:37:VAL:HG22	1:A:45:LEU:HD21	1.64	0.79
1:A:94:TYR:HB2	1:A:109:GLY:CA	2.12	0.79
1:A:38:LYS:HB2	1:A:93:VAL:HG13	1.63	0.78
1:A:94:TYR:O	1:A:109:GLY:CA	2.31	0.78
3:D:552:TYR:CE1	3:D:577:THR:HG22	2.18	0.78
1:A:36:TRP:HE1	1:A:79:ALA:HB1	1.46	0.78
5:F:51:GLY:O	5:F:55:ASN:ND2	2.17	0.78
4:G:27:PHE:HZ	4:G:34:ILE:HD11	1.49	0.77
4:E:18:LEU:HB3	4:E:82:MET:HB2	1.66	0.77
2:B:46:LEU:CD2	2:B:55:ILE:HG13	2.15	0.76
3:C:450:GLN:OE1	3:C:450:GLN:N	2.18	0.76
5:F:35:ALA:HB3	5:F:53:THR:HG22	1.66	0.76
4:E:96:VAL:HG21	4:E:106:LEU:CD2	2.16	0.76
5:F:20:LEU:HG	5:F:104:THR:HG21	1.67	0.76
4:G:85:LEU:HD21	4:G:117:VAL:CG1	2.15	0.76
3:D:433:LYS:HD3	3:D:494:PHE:CZ	2.21	0.75
4:E:20:ILE:HG23	4:E:80:LEU:HB3	1.69	0.75
4:E:24:VAL:HG21	4:E:29:LEU:HD21	1.68	0.75
5:F:65:SER:O	5:F:76:THR:OG1	2.04	0.75
4:G:67:LEU:HD11	4:G:80:LEU:HD11	1.69	0.75
3:D:542:LYS:HG3	4:E:54:ALA:HB1	1.69	0.75
4:E:40:PRO:CG	4:E:46:GLU:OE1	2.34	0.75
1:A:53:PRO:HA	1:A:72:VAL:HG21	1.68	0.74
3:D:455:LYS:HE3	3:D:575:THR:HG22	1.68	0.74
4:G:21:SER:HB3	4:G:79:PHE:CD1	2.23	0.74
1:A:17:SER:HB3	1:A:82:HIS:CE1	2.23	0.74
3:D:542:LYS:CG	4:E:54:ALA:HB1	2.18	0.74
1:A:51:ILE:CD1	1:A:72:VAL:HG13	2.16	0.73
4:G:12:VAL:HG23	4:G:85:LEU:HD22	1.70	0.73
4:E:85:LEU:HD21	4:E:117:VAL:CG2	2.18	0.73
3:D:604:TRP:CD1	3:D:606:TRP:CD1	2.76	0.73
4:E:35:HIS:HB2	4:E:96:VAL:CG2	2.18	0.73
1:A:37:VAL:HG13	1:A:45:LEU:HG	1.71	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:H:40:GLU:O	5:H:86:ALA:HB1	1.89	0.72
4:E:85:LEU:HD21	4:E:117:VAL:HG21	1.71	0.72
4:E:6:GLU:OE2	4:E:110:GLY:HA3	1.90	0.71
4:E:40:PRO:HA	4:E:91:ALA:HB2	1.72	0.71
4:E:67:LEU:CD1	4:E:80:LEU:HD11	2.19	0.71
4:G:45:LEU:HD11	5:H:46:PHE:HE2	1.55	0.71
4:E:18:LEU:O	4:E:81[B]:LYS:HA	1.91	0.71
4:E:4:LEU:O	4:E:5:LYS:HG3	1.91	0.71
4:E:35:HIS:HD2	4:E:98:GLU:HB2	1.54	0.71
5:F:93:TRP:CD1	5:F:94:PHE:O	2.43	0.70
4:E:59:TYR:HE1	4:E:69:ILE:HG12	1.54	0.70
4:E:40:PRO:HD3	4:E:46:GLU:OE1	1.89	0.70
3:C:433:LYS:NZ	3:C:494:PHE:CE2	2.57	0.70
4:E:18:LEU:O	4:E:81[A]:LYS:HA	1.92	0.69
1:A:61:ASN:HB2	2:B:95:PRO:HB3	1.74	0.69
4:E:18:LEU:HD22	4:E:115:VAL:HG11	1.74	0.69
3:D:552:TYR:CD1	3:D:577:THR:HG22	2.27	0.69
1:A:23:LYS:CB	1:A:78:THR:HG22	2.23	0.68
4:E:40:PRO:HD2	4:E:46:GLU:OE1	1.91	0.68
4:G:3:GLN:O	4:G:4:LEU:HD12	1.94	0.68
4:E:38:ARG:HG2	4:E:40:PRO:HD3	1.75	0.68
5:F:52:GLY:O	5:F:53:THR:OG1	2.11	0.68
4:E:2:VAL:HB	4:E:108:TYR:CE2	2.30	0.67
4:G:38:ARG:HB3	4:G:48:LEU:CD2	2.23	0.67
4:G:18:LEU:HD11	4:G:115:VAL:HG21	1.76	0.67
5:F:37:TRP:CG	5:F:75:LEU:HD13	2.29	0.67
5:H:65:SER:O	5:H:75:LEU:HD12	1.94	0.67
1:A:77:ILE:O	1:A:78:THR:HG23	1.94	0.67
4:G:21:SER:HB3	4:G:79:PHE:HD1	1.58	0.67
2:B:37:GLN:O	2:B:45:ARG:N	2.28	0.66
1:A:105:TYR:OH	2:B:46:LEU:HD13	1.96	0.66
4:E:18:LEU:CD2	4:E:115:VAL:HG11	2.26	0.66
5:F:37:TRP:O	5:F:49:LEU:HB2	1.96	0.66
4:G:23:THR:O	4:G:23:THR:HG23	1.96	0.66
3:C:435:VAL:HG22	3:C:637:CYS:HB2	1.78	0.65
1:A:45:LEU:HD22	2:B:98:PHE:CE1	2.31	0.65
4:G:29:LEU:HD22	4:G:71:LYS:CE	2.26	0.65
5:H:4:VAL:CG2	5:H:92:LEU:HD12	2.26	0.65
5:H:4:VAL:HG22	5:H:92:LEU:HD12	1.77	0.65
1:A:37:VAL:CG1	1:A:45:LEU:HG	2.27	0.65
4:G:87:THR:HA	4:G:117:VAL:HG21	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:30:THR:HG23	4:E:73:ASN:HD21	1.62	0.64
1:A:60:TYR:CZ	1:A:70:LEU:HG	2.31	0.64
4:E:38:ARG:HH21	4:E:48:LEU:HD21	1.62	0.64
1:A:31:SER:HA	1:A:53:PRO:HG2	1.78	0.64
4:G:67:LEU:HD21	4:G:69:ILE:HD11	1.80	0.64
2:B:46:LEU:HD22	2:B:55:ILE:HG13	1.80	0.64
3:D:433:LYS:NZ	3:D:494:PHE:CE2	2.66	0.64
1:A:23:LYS:CG	1:A:78:THR:CG2	2.63	0.63
4:E:20:ILE:CG2	4:E:80:LEU:HB3	2.28	0.63
4:E:35:HIS:CD2	4:E:98:GLU:HB2	2.33	0.63
5:F:57:ALA:O	5:F:60:VAL:HG23	1.99	0.63
4:G:18:LEU:HB3	4:G:82:MET:HB2	1.81	0.63
4:G:51:ILE:HA	4:G:57:THR:HG22	1.79	0.63
4:G:87:THR:HA	4:G:117:VAL:CG2	2.28	0.63
3:C:433:LYS:CD	3:C:494:PHE:CE2	2.82	0.63
2:B:55:ILE:O	2:B:58:ILE:HG12	1.98	0.63
1:A:81:MET:HE2	1:A:83:LEU:HG	1.81	0.62
2:B:4:LEU:HD11	2:B:90:GLN:HG2	1.81	0.62
3:C:623:LEU:HD23	3:C:623:LEU:O	1.98	0.62
4:E:96:VAL:HG21	4:E:106:LEU:HD23	1.80	0.62
4:E:2:VAL:HB	4:E:108:TYR:HE2	1.64	0.62
4:E:48:LEU:HD22	4:E:63:LEU:HD23	1.81	0.62
2:B:21:LEU:O	2:B:73:LEU:N	2.27	0.62
2:B:21:LEU:N	2:B:73:LEU:O	2.32	0.62
3:D:455:LYS:HE3	3:D:575:THR:CG2	2.30	0.62
2:B:91:THR:HA	2:B:96:LEU:HD22	0.63	0.62
1:A:27:TYR:HB2	1:A:100:TYR:OH	2.00	0.61
3:C:510:VAL:HG21	3:C:547:PHE:CE2	2.35	0.61
3:D:508:VAL:HG21	3:D:541:VAL:HG11	1.81	0.61
3:C:433:LYS:HD3	3:C:494:PHE:CZ	2.34	0.61
2:B:91:THR:CB	2:B:96:LEU:CD2	2.69	0.61
3:C:466:VAL:HA	3:C:510:VAL:HG22	1.82	0.61
3:C:601:PRO:HG2	3:C:605:VAL:HG22	1.82	0.61
4:E:35:HIS:O	4:E:95:CYS:HA	2.01	0.61
4:E:40:PRO:HG2	4:E:46:GLU:OE1	2.00	0.61
4:G:6:GLU:OE2	4:G:20:ILE:HB	2.00	0.61
3:C:544:THR:O	3:C:584:GLN:NE2	2.32	0.61
5:H:29:VAL:HG11	5:H:73:ALA:N	2.16	0.60
5:F:86:ALA:HB3	5:F:88:TYR:CE1	2.36	0.60
4:G:67:LEU:HD11	4:G:80:LEU:CD1	2.30	0.60
5:F:37:TRP:CD1	5:F:75:LEU:HD13	2.37	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:35:HIS:CA	4:E:50:VAL:HG23	2.32	0.59
5:F:37:TRP:CZ3	5:F:90:CYS:HB3	2.37	0.59
4:G:85:LEU:HG	4:G:86:GLN:N	2.18	0.59
3:C:542:LYS:HG2	4:G:54:ALA:HB1	1.85	0.59
4:G:36:TRP:O	4:G:48:LEU:HB2	2.02	0.59
1:A:93:VAL:HG12	1:A:93:VAL:O	2.03	0.58
4:G:85:LEU:HD21	4:G:117:VAL:HG11	1.84	0.58
4:E:46:GLU:HG2	6:I:1:NAG:H62	1.85	0.58
4:G:93:TYR:O	4:G:112:GLY:HA2	2.03	0.58
1:A:77:ILE:O	1:A:78:THR:CG2	2.51	0.58
3:D:517:ASP:OD2	4:E:54:ALA:HB2	2.04	0.58
4:G:51:ILE:CD1	4:G:71:LYS:HB3	2.31	0.58
1:A:71:THR:O	1:A:80:TYR:HB2	2.03	0.58
3:C:544:THR:HG22	4:G:54:ALA:HA	1.84	0.57
3:D:552:TYR:CE1	3:D:577:THR:CG2	2.85	0.57
5:F:94:PHE:HD2	5:F:99:VAL:HG21	1.70	0.57
1:A:67:LYS:O	1:A:83:LEU:HD23	2.05	0.57
1:A:94:TYR:C	1:A:109:GLY:HA2	2.23	0.57
3:C:433:LYS:HZ2	3:C:494:PHE:HE2	1.42	0.57
2:B:49:LYS:O	2:B:53:GLN:HB3	2.04	0.57
4:G:57:THR:HB	4:G:59:TYR:CE1	2.40	0.57
5:H:17:THR:OG1	5:H:77:ILE:O	2.10	0.57
3:C:454:ASN:N	3:C:479:GLN:O	2.38	0.57
5:H:12:THR:HG21	5:H:18:VAL:HG21	1.85	0.57
1:A:47:TRP:CH2	1:A:50:GLU:HG2	2.40	0.56
2:B:91:THR:HB	2:B:96:LEU:CD2	2.35	0.56
3:D:552:TYR:HE1	3:D:577:THR:CG2	2.18	0.56
4:E:24:VAL:HG22	4:E:76:SER:HB3	1.87	0.56
5:F:49:LEU:O	5:F:50:ILE:HD13	2.05	0.56
1:A:29:PHE:HA	3:C:560:SER:O	2.06	0.56
2:B:91:THR:CA	2:B:96:LEU:HD21	2.27	0.56
3:C:433:LYS:HD3	3:C:494:PHE:CE2	2.40	0.56
2:B:46:LEU:O	2:B:47:LEU:HD23	2.06	0.56
4:E:36:TRP:CD1	4:E:69:ILE:HD12	2.41	0.56
4:E:38:ARG:CG	4:E:40:PRO:HD3	2.36	0.56
4:G:4:LEU:HD23	4:G:95:CYS:SG	2.46	0.56
2:B:28:SER:HA	2:B:69:THR:HG22	1.88	0.55
2:B:32:ASN:HD22	2:B:92:ASN:HD22	1.54	0.55
4:G:85:LEU:HD21	4:G:117:VAL:HG12	1.86	0.55
4:E:4:LEU:O	4:E:5:LYS:CG	2.54	0.55
5:F:91:ALA:O	5:F:92:LEU:HD23	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:24:VAL:HB	4:G:27:PHE:CE2	2.40	0.55
3:D:620:ASP:OD1	3:D:620:ASP:N	2.39	0.55
3:D:503:ILE:HD12	3:D:521:VAL:HG13	1.88	0.55
4:E:24:VAL:HG21	4:E:29:LEU:CD2	2.36	0.55
4:G:66:ARG:HD2	4:G:83:ASN:O	2.06	0.55
2:B:4:LEU:HD21	2:B:90:GLN:HB3	1.87	0.55
4:E:51:ILE:CD1	4:E:71:LYS:HD3	2.37	0.55
4:G:23:THR:O	4:G:23:THR:CG2	2.55	0.54
2:B:46:LEU:HD23	2:B:47:LEU:N	2.23	0.54
5:F:29:VAL:HG11	5:F:71:ASP:HA	1.88	0.54
4:E:51:ILE:HD13	4:E:71:LYS:HD3	1.90	0.54
1:A:60:TYR:CE1	1:A:70:LEU:CG	2.79	0.54
3:D:451:THR:HG21	3:D:626:LEU:HD23	1.90	0.54
1:A:45:LEU:HD23	1:A:46:GLU:N	2.23	0.54
4:E:36:TRP:HB2	4:E:49:GLY:O	2.08	0.54
4:E:98:GLU:OE2	4:E:105:GLY:N	2.41	0.54
4:G:34:ILE:O	4:G:50:VAL:HG23	2.07	0.54
4:G:38:ARG:HG3	4:G:91:ALA:HB3	1.89	0.54
5:H:49:LEU:HD23	5:H:60:VAL:HG22	1.89	0.53
3:C:453:VAL:HG12	3:C:626:LEU:HD22	1.89	0.53
4:G:34:ILE:HG21	4:G:78:VAL:HG21	1.90	0.53
5:F:56:ARG:HG3	5:F:60:VAL:HB	1.90	0.53
5:F:56:ARG:HG2	5:F:57:ALA:O	2.09	0.53
3:D:433:LYS:NZ	3:D:494:PHE:CZ	2.75	0.53
4:G:40:PRO:HA	4:G:91:ALA:CB	2.39	0.53
2:B:30:SER:HB3	3:C:575:THR:OG1	2.08	0.53
3:D:433:LYS:HZ2	3:D:494:PHE:HZ	1.53	0.53
3:C:453:VAL:CG1	3:C:626:LEU:HD22	2.39	0.53
2:B:91:THR:C	2:B:96:LEU:CD2	2.77	0.52
1:A:31:SER:HA	1:A:53:PRO:CG	2.38	0.52
3:D:542:LYS:HG2	4:E:54:ALA:HB1	1.90	0.52
4:G:45:LEU:HD11	5:H:46:PHE:CE2	2.41	0.52
1:A:50:GLU:O	1:A:58:ALA:HA	2.09	0.52
4:G:12:VAL:CG2	4:G:85:LEU:HD22	2.38	0.52
3:D:434:VAL:HG13	3:D:487:VAL:HG13	1.91	0.52
4:G:4:LEU:HD11	4:G:27:PHE:HE2	1.73	0.52
4:G:27:PHE:CZ	4:G:34:ILE:HD11	2.38	0.52
4:G:8:GLY:HA2	4:G:20:ILE:HG22	1.92	0.52
3:D:552:TYR:HB3	3:D:575:THR:HB	1.92	0.52
6:J:1:NAG:H61	6:J:2:NAG:H2	1.91	0.52
3:C:476:LEU:HD12	3:C:539:PHE:CZ	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:20:LEU:O	5:F:74:ALA:HA	2.09	0.51
5:H:96:ASN:OD1	5:H:96:ASN:O	2.29	0.51
4:E:5:LYS:O	4:E:23:THR:N	2.42	0.51
4:E:99:ASP:N	4:E:99:ASP:OD1	2.44	0.51
1:A:4:LEU:HD22	1:A:96:CYS:SG	2.51	0.51
3:C:572:ARG:NH2	3:C:574:ASP:O	2.39	0.51
1:A:4:LEU:CD2	1:A:24:ALA:HB2	2.41	0.51
4:E:4:LEU:HD23	4:E:24:VAL:HA	1.93	0.51
1:A:37:VAL:HG11	1:A:45:LEU:CD1	2.41	0.50
5:H:20:LEU:HB2	5:H:37:TRP:CH2	2.46	0.50
5:H:49:LEU:HD13	5:H:64:PHE:CE2	2.46	0.50
5:F:9:ALA:C	5:F:10:LEU:HD12	2.31	0.50
2:B:94:TRP:HH2	3:D:565:ALA:HB2	1.77	0.50
4:G:23:THR:OG1	4:G:77:GLN:HG2	2.11	0.50
4:G:47:TRP:CE3	5:H:97:HIS:HB2	2.47	0.50
5:F:97:HIS:CE1	5:F:99:VAL:HG23	2.46	0.50
3:D:433:LYS:HD3	3:D:494:PHE:CD2	2.42	0.50
4:E:36:TRP:N	4:E:49:GLY:O	2.40	0.50
4:E:38:ARG:NH2	4:E:48:LEU:HD21	2.27	0.50
3:C:441:PRO:HG3	3:C:447:ASN:OD1	2.11	0.50
4:E:40:PRO:HA	4:E:91:ALA:CB	2.41	0.50
2:B:4:LEU:HD12	2:B:4:LEU:N	2.27	0.49
3:C:433:LYS:HE3	3:C:492:ILE:O	2.12	0.49
4:E:24:VAL:HG11	4:E:29:LEU:HD11	1.93	0.49
1:A:81:MET:CE	1:A:93:VAL:HG11	2.35	0.49
1:A:105:TYR:OH	2:B:46:LEU:HB3	2.13	0.49
3:C:591:THR:HG22	3:C:592:ASN:N	2.27	0.49
4:G:4:LEU:HD11	4:G:27:PHE:CE2	2.48	0.49
4:E:60:ASN:ND2	6:I:1:NAG:O5	2.45	0.49
3:D:519:TYR:HH	4:E:56:THR:HG1	1.61	0.49
5:F:97:HIS:HE1	5:F:99:VAL:CG2	2.26	0.49
4:E:10:GLY:HA2	4:E:114:SER:O	2.13	0.48
3:D:591:THR:HG22	3:D:592:ASN:N	2.28	0.48
4:E:38:ARG:HD3	4:E:93:TYR:CE1	2.47	0.48
1:A:4:LEU:HA	1:A:24:ALA:HA	1.95	0.48
4:G:3:GLN:C	4:G:4:LEU:HD12	2.33	0.48
5:H:3:VAL:N	5:H:25:SER:OG	2.39	0.48
4:E:34:ILE:O	4:E:50:VAL:HG23	2.14	0.48
5:F:49:LEU:HD13	5:F:64:PHE:CE2	2.48	0.48
5:F:93:TRP:NE1	5:F:95:SER:O	2.46	0.48
1:A:20:LEU:HD11	1:A:112:VAL:HG21	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:4:LEU:HD21	2:B:90:GLN:HG2	1.96	0.48
3:C:591:THR:HG22	3:C:592:ASN:H	1.77	0.48
2:B:35:TRP:CZ3	2:B:73:LEU:HD22	2.49	0.48
3:D:544:THR:O	3:D:584:GLN:NE2	2.47	0.48
4:E:66:ARG:HG2	4:E:83:ASN:O	2.14	0.48
4:E:109:TRP:CZ2	5:F:38:VAL:HG21	2.49	0.48
2:B:6:GLN:HA	2:B:22:SER:O	2.14	0.47
4:G:21:SER:HB3	4:G:79:PHE:CE1	2.49	0.47
4:G:42:GLY:C	4:G:43:LYS:HG2	2.33	0.47
4:G:94:TYR:OH	5:H:44:HIS:HB3	2.13	0.47
5:H:12:THR:OG1	5:H:13:SER:N	2.47	0.47
1:A:60:TYR:HE1	1:A:70:LEU:CG	2.17	0.47
2:B:36:TYR:CE1	2:B:46:LEU:HB2	2.50	0.47
2:B:36:TYR:HE1	2:B:46:LEU:HB2	1.78	0.47
4:G:34:ILE:C	4:G:50:VAL:HG23	2.35	0.47
5:H:56:ARG:HD2	5:H:60:VAL:HG12	1.96	0.47
2:B:49:LYS:O	2:B:50:SER:HB2	2.14	0.47
4:G:30:THR:HG21	4:G:73:ASN:ND2	2.29	0.47
5:H:20:LEU:O	5:H:74:ALA:HA	2.13	0.47
1:A:45:LEU:HD13	2:B:98:PHE:CE2	2.50	0.47
1:A:94:TYR:C	1:A:109:GLY:CA	2.81	0.47
2:B:46:LEU:C	2:B:47:LEU:HD23	2.35	0.47
4:E:24:VAL:CG2	4:E:29:LEU:HD21	2.42	0.47
4:E:48:LEU:CD2	4:E:63:LEU:HD23	2.45	0.47
4:E:97:ARG:O	4:E:97:ARG:HG3	2.13	0.47
5:F:87:ILE:HG12	5:F:105:LYS:HA	1.97	0.47
4:G:39:GLN:HG3	4:G:45:LEU:CD2	2.45	0.47
5:H:48:GLY:O	5:H:57:ALA:HB3	2.14	0.47
3:C:435:VAL:HG22	3:C:637:CYS:CB	2.42	0.47
3:C:596:VAL:HG11	3:C:600:MET:SD	2.55	0.47
5:F:93:TRP:C	5:F:94:PHE:O	2.42	0.47
3:C:564:ASP:CB	3:D:576:TYR:CE1	2.98	0.47
4:E:6:GLU:HA	4:E:22:CYS:HA	1.96	0.47
5:F:97:HIS:CE1	5:F:99:VAL:CG2	2.98	0.47
1:A:96:CYS:SG	1:A:96:CYS:O	2.72	0.47
2:B:33:LEU:HD23	2:B:33:LEU:O	2.14	0.47
4:G:51:ILE:HB	4:G:57:THR:HG22	1.97	0.47
5:H:41:LYS:HB3	5:H:42:PRO:HD2	1.96	0.47
3:C:476:LEU:HD12	3:C:539:PHE:HZ	1.80	0.46
3:D:542:LYS:HD2	3:D:585:GLY:HA2	1.97	0.46
4:E:86:GLN:O	4:E:117:VAL:HG11	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:22:CYS:HB2	4:G:36:TRP:CH2	2.50	0.46
3:C:469:ALA:HB3	3:C:509:LEU:HD12	1.98	0.46
3:C:477:THR:HG22	3:C:478:MET:N	2.29	0.46
4:E:98:GLU:OE1	4:E:100:TYR:N	2.49	0.46
4:E:38:ARG:HG3	4:E:39:GLN:N	2.30	0.46
5:F:37:TRP:HA	5:F:89:PHE:O	2.15	0.46
3:D:533:HIS:HB2	3:D:600:MET:HE1	1.98	0.46
5:F:22:CYS:HB2	5:F:37:TRP:CZ2	2.51	0.46
5:F:87:ILE:HG22	5:F:89:PHE:CE1	2.50	0.46
4:G:8:GLY:CA	4:G:20:ILE:HG22	2.46	0.46
4:E:17:SER:HA	4:E:82:MET:O	2.16	0.46
4:E:47:TRP:O	4:E:60:ASN:ND2	2.47	0.46
1:A:67:LYS:O	1:A:67:LYS:HG2	2.16	0.46
4:E:96:VAL:HG12	4:E:109:TRP:CD2	2.51	0.45
5:F:19:THR:O	5:F:20:LEU:HD13	2.15	0.45
5:H:41:LYS:HB3	5:H:42:PRO:CD	2.46	0.45
5:F:106:LEU:C	5:F:106:LEU:HD23	2.37	0.45
5:F:33:ASN:HD22	5:F:92:LEU:HD13	1.81	0.45
5:H:35:ALA:HA	5:H:92:LEU:HD23	1.99	0.45
1:A:29:PHE:HB2	1:A:100:TYR:CE1	2.52	0.45
1:A:77:ILE:C	1:A:78:THR:HG23	2.36	0.45
2:B:88:CYS:O	2:B:88:CYS:SG	2.75	0.45
5:H:38:VAL:HG23	5:H:38:VAL:O	2.17	0.45
3:C:510:VAL:HG21	3:C:547:PHE:HE2	1.82	0.45
1:A:105:TYR:H	1:A:105:TYR:HD2	1.54	0.45
4:G:51:ILE:CB	4:G:57:THR:HG22	2.47	0.45
4:G:96:VAL:CG1	4:G:109:TRP:CD2	3.00	0.45
5:H:20:LEU:HD11	5:H:77:ILE:HD11	1.99	0.45
5:H:49:LEU:HA	5:H:60:VAL:HG21	1.98	0.45
2:B:4:LEU:HD21	2:B:90:GLN:CG	2.48	0.44
3:C:468:ILE:HG13	3:C:508:VAL:HG13	1.99	0.44
3:C:538:LEU:HD23	3:C:591:THR:HG23	1.98	0.44
5:F:10:LEU:HD22	5:F:20:LEU:CD1	2.47	0.44
4:G:51:ILE:HB	4:G:69:ILE:HG22	1.99	0.44
4:G:96:VAL:HG11	4:G:109:TRP:CD2	2.52	0.44
4:E:6:GLU:CG	4:E:95:CYS:SG	3.06	0.44
5:H:20:LEU:HD11	5:H:77:ILE:CD1	2.48	0.44
1:A:106:TRP:CH2	2:B:44:PRO:HB2	2.52	0.44
4:E:96:VAL:HG11	4:E:106:LEU:HD23	1.98	0.44
4:E:106:LEU:N	4:E:106:LEU:HD12	2.32	0.44
5:F:60:VAL:HG12	5:F:61:PRO:HD2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:100:TYR:HD1	4:G:100:TYR:H	1.63	0.44
5:H:56:ARG:CG	5:H:60:VAL:HB	2.48	0.44
3:D:493:ASP:O	3:D:493:ASP:OD2	2.35	0.44
4:G:117:VAL:O	4:G:117:VAL:HG23	2.17	0.44
5:H:49:LEU:CD2	5:H:60:VAL:HG22	2.46	0.44
1:A:37:VAL:CG2	1:A:45:LEU:HD21	2.41	0.44
1:A:47:TRP:HH2	1:A:50:GLU:HG2	1.81	0.44
4:G:90:THR:HB	4:G:117:VAL:HG22	1.99	0.44
4:G:38:ARG:HG3	4:G:91:ALA:CB	2.48	0.44
4:G:51:ILE:CA	4:G:57:THR:HG22	2.48	0.44
1:A:4:LEU:HD23	1:A:24:ALA:HB2	2.00	0.43
1:A:70:LEU:CD2	1:A:81:MET:HG3	2.48	0.43
1:A:20:LEU:HD22	1:A:83:LEU:HD12	2.00	0.43
4:E:39:GLN:O	4:E:39:GLN:HG2	2.18	0.43
4:E:66:ARG:NH1	4:E:84:SER:O	2.51	0.43
5:F:39:GLN:O	5:F:46:PHE:HD1	2.01	0.43
2:B:2:ILE:HG22	2:B:4:LEU:CD1	2.48	0.43
5:F:63:ARG:O	5:F:78:THR:HG23	2.19	0.43
1:A:45:LEU:HD22	2:B:98:PHE:CZ	2.53	0.43
3:C:564:ASP:CB	3:D:576:TYR:CZ	3.02	0.43
5:F:50:ILE:HG22	5:F:51:GLY:N	2.34	0.43
5:H:50:ILE:HD13	5:H:50:ILE:HA	1.86	0.43
3:D:508:VAL:CG2	3:D:541:VAL:HG11	2.46	0.43
5:H:29:VAL:HG21	5:H:73:ALA:HB2	2.01	0.43
5:F:4:VAL:HG23	5:F:94:PHE:HE2	1.83	0.43
5:F:56:ARG:HG2	5:F:57:ALA:N	2.33	0.43
4:G:32:PHE:CD2	4:G:32:PHE:N	2.87	0.43
4:G:87:THR:HA	4:G:117:VAL:HG23	2.01	0.43
5:F:91:ALA:C	5:F:92:LEU:HD23	2.40	0.43
3:D:450:GLN:O	3:D:450:GLN:HG2	2.18	0.42
3:D:604:TRP:CD1	3:D:606:TRP:HD1	2.34	0.42
5:F:22:CYS:HB2	5:F:37:TRP:CH2	2.54	0.42
4:G:52:TRP:NE1	4:G:58:ASN:OD1	2.38	0.42
5:H:49:LEU:HD13	5:H:64:PHE:CZ	2.53	0.42
1:A:34:MET:SD	1:A:79:ALA:HB2	2.60	0.42
5:F:6:GLN:NE2	5:F:104:THR:HG22	2.34	0.42
5:F:28:ALA:O	5:F:29:VAL:HG12	2.19	0.42
5:H:33:ASN:O	5:H:93:TRP:HB3	2.18	0.42
5:F:12:THR:HG21	5:F:18:VAL:HG21	2.01	0.42
3:C:540:LEU:HD23	3:C:540:LEU:O	2.19	0.42
4:E:2:VAL:HG13	4:E:27:PHE:CD1	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:21:SER:HA	4:E:78:VAL:O	2.19	0.42
4:G:103:PHE:CZ	5:H:51:GLY:HA3	2.54	0.42
4:G:103:PHE:HD1	4:G:105:GLY:H	1.66	0.42
2:B:32:ASN:HD22	2:B:92:ASN:ND2	2.17	0.42
2:B:58:ILE:HG22	2:B:59:PRO:HD2	2.00	0.42
3:C:433:LYS:CD	3:C:494:PHE:CZ	3.01	0.42
3:D:526:THR:O	3:D:534:GLN:N	2.50	0.42
2:B:36:TYR:O	2:B:87:PHE:N	2.53	0.42
3:C:433:LYS:NZ	3:C:494:PHE:HE2	2.11	0.42
4:G:101:ASP:N	4:G:101:ASP:OD1	2.53	0.42
1:A:39:GLN:HB3	1:A:94:TYR:CE2	2.55	0.42
4:G:40:PRO:HA	4:G:91:ALA:HB2	2.01	0.42
5:H:4:VAL:HG21	5:H:92:LEU:HD12	1.98	0.42
2:B:20:SER:HA	2:B:73:LEU:O	2.19	0.42
3:D:634:THR:HG23	3:D:634:THR:O	2.20	0.42
4:E:109:TRP:CD2	5:F:46:PHE:HB2	2.54	0.42
4:G:30:THR:CG2	4:G:73:ASN:ND2	2.83	0.42
5:H:20:LEU:HD12	5:H:75:LEU:O	2.20	0.41
1:A:61:ASN:CB	2:B:95:PRO:HB3	2.46	0.41
4:G:36:TRP:N	4:G:49:GLY:O	2.51	0.41
3:D:438:PHE:CE2	3:D:482:THR:HG21	2.55	0.41
4:G:29:LEU:HD22	4:G:71:LYS:NZ	2.35	0.41
4:G:37:ILE:HG21	4:G:109:TRP:CH2	2.55	0.41
2:B:46:LEU:HD21	2:B:55:ILE:HG13	1.97	0.41
4:E:4:LEU:C	4:E:5:LYS:HG3	2.40	0.41
4:E:48:LEU:HD23	4:E:48:LEU:HA	1.82	0.41
3:D:523:GLN:OE1	3:D:605:VAL:N	2.53	0.41
5:F:87:ILE:HA	5:F:104:THR:O	2.20	0.41
5:F:91:ALA:HB1	5:F:98:TRP:CE3	2.55	0.41
4:G:38:ARG:NH2	6:J:1:NAG:O6	2.54	0.41
1:A:103:MET:HA	1:A:105:TYR:HE2	1.85	0.41
5:F:35:ALA:HA	5:F:91:ALA:O	2.21	0.41
5:F:39:GLN:O	5:F:46:PHE:HA	2.20	0.41
3:D:639:GLU:OE1	3:D:639:GLU:N	2.54	0.41
2:B:91:THR:HB	2:B:96:LEU:HD21	2.03	0.41
5:H:33:ASN:ND2	5:H:93:TRP:O	2.48	0.41
2:B:2:ILE:HG22	2:B:4:LEU:HD11	2.02	0.41
3:C:438:PHE:CE2	3:C:482:THR:HG21	2.56	0.41
3:D:433:LYS:NZ	3:D:494:PHE:HE2	2.11	0.41
5:H:12:THR:CG2	5:H:18:VAL:HG21	2.50	0.41
1:A:17:SER:CB	1:A:82:HIS:CE1	3.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:100:TYR:O	4:E:100:TYR:CD1	2.74	0.41
2:B:36:TYR:CE1	2:B:46:LEU:HD12	2.57	0.40
4:G:85:LEU:HG	4:G:86:GLN:H	1.85	0.40
5:H:20:LEU:HB2	5:H:37:TRP:CZ3	2.56	0.40
3:D:604:TRP:CG	3:D:605:VAL:N	2.88	0.40
4:E:35:HIS:CE1	4:E:50:VAL:HG21	2.57	0.40
4:E:60:ASN:HD21	6:I:1:NAG:C2	2.33	0.40
5:H:12:THR:HG21	5:H:18:VAL:CG2	2.50	0.40
5:F:10:LEU:HD13	5:F:20:LEU:HD12	2.04	0.40
1:A:105:TYR:OH	2:B:46:LEU:CB	2.70	0.40
4:E:2:VAL:HB	4:E:108:TYR:CD2	2.56	0.40
4:E:63:LEU:HD12	4:E:63:LEU:HA	1.92	0.40
4:G:45:LEU:HD13	4:G:109:TRP:CH2	2.56	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	96/225 (43%)	86 (90%)	10 (10%)	0	100	100
2	B	69/214 (32%)	62 (90%)	7 (10%)	0	100	100
3	C	210/228 (92%)	196 (93%)	14 (7%)	0	100	100
3	D	213/228 (93%)	200 (94%)	13 (6%)	0	100	100
4	E	112/228 (49%)	105 (94%)	7 (6%)	0	100	100
4	G	117/228 (51%)	112 (96%)	5 (4%)	0	100	100
5	F	88/217 (41%)	80 (91%)	8 (9%)	0	100	100
5	H	97/217 (45%)	84 (87%)	13 (13%)	0	100	100
All	All	1002/1785 (56%)	925 (92%)	77 (8%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	69/193 (36%)	69 (100%)	0	100	100
2	B	50/192 (26%)	50 (100%)	0	100	100
3	C	173/195 (89%)	172 (99%)	1 (1%)	84	90
3	D	178/195 (91%)	173 (97%)	5 (3%)	38	64
4	E	92/198 (46%)	85 (92%)	7 (8%)	11	35
4	G	86/198 (43%)	83 (96%)	3 (4%)	31	58
5	F	66/182 (36%)	59 (89%)	7 (11%)	5	22
5	H	59/182 (32%)	59 (100%)	0	100	100
All	All	773/1535 (50%)	750 (97%)	23 (3%)	37	62

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	442	MET
3	D	445	ASN
3	D	464	TYR
3	D	494	PHE
3	D	542	LYS
3	D	597	ASP
4	E	12	VAL
4	E	66	ARG
4	E	73	ASN
4	E	74	SER
4	E	79	PHE
4	E	99	ASP
4	E	113	THR
5	F	25	SER
5	F	26	THR
5	F	36	SER

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Mol	Chain	Res	Type
5	F	94	PHE
5	F	95	SER
5	F	96	ASN
5	F	104	THR
4	G	71	LYS
4	G	80	LEU
4	G	95	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	92	ASN
3	C	534	GLN
3	D	584	GLN
4	E	60	ASN
4	E	73	ASN
5	F	33	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 ⓘ

6 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
6	NAG	I	1	6	14,14,15	0.48	0	17,19,21	1.71	4 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	NAG	I	2	6	14,14,15	0.39	0	17,19,21	1.09	2 (11%)
6	BMA	I	3	6	11,11,12	0.30	0	15,15,17	0.48	0
6	NAG	J	1	4,6	14,14,15	0.37	0	17,19,21	0.74	0
6	NAG	J	2	6	13,13,15	0.59	0	15,17,21	0.84	1 (6%)
6	BMA	J	3	6	6,6,12	0.46	0	6,6,17	0.59	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	I	1	6	-	2/6/23/26	0/1/1/1
6	NAG	I	2	6	-	2/6/23/26	0/1/1/1
6	BMA	I	3	6	-	0/2/19/22	0/1/1/1
6	NAG	J	1	4,6	-	3/6/23/26	0/1/1/1
6	NAG	J	2	6	-	3/6/19/26	0/1/1/1
6	BMA	J	3	6	-	-	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	I	1	NAG	C4-C3-C2	-4.36	104.63	111.02
6	I	2	NAG	C1-C2-N2	2.91	115.02	110.43
6	I	2	NAG	C2-N2-C7	2.81	126.67	122.90
6	I	1	NAG	O5-C5-C4	-2.48	104.80	110.83
6	I	1	NAG	O5-C1-C2	2.46	115.10	111.29
6	I	1	NAG	C1-O5-C5	2.38	115.37	112.19
6	J	2	NAG	C1-O5-C5	2.37	115.36	112.19

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	I	2	NAG	C1-C2-N2-C7
6	J	2	NAG	C8-C7-N2-C2
6	J	2	NAG	O7-C7-N2-C2
6	J	2	NAG	O5-C5-C6-O6
6	I	1	NAG	O5-C5-C6-O6

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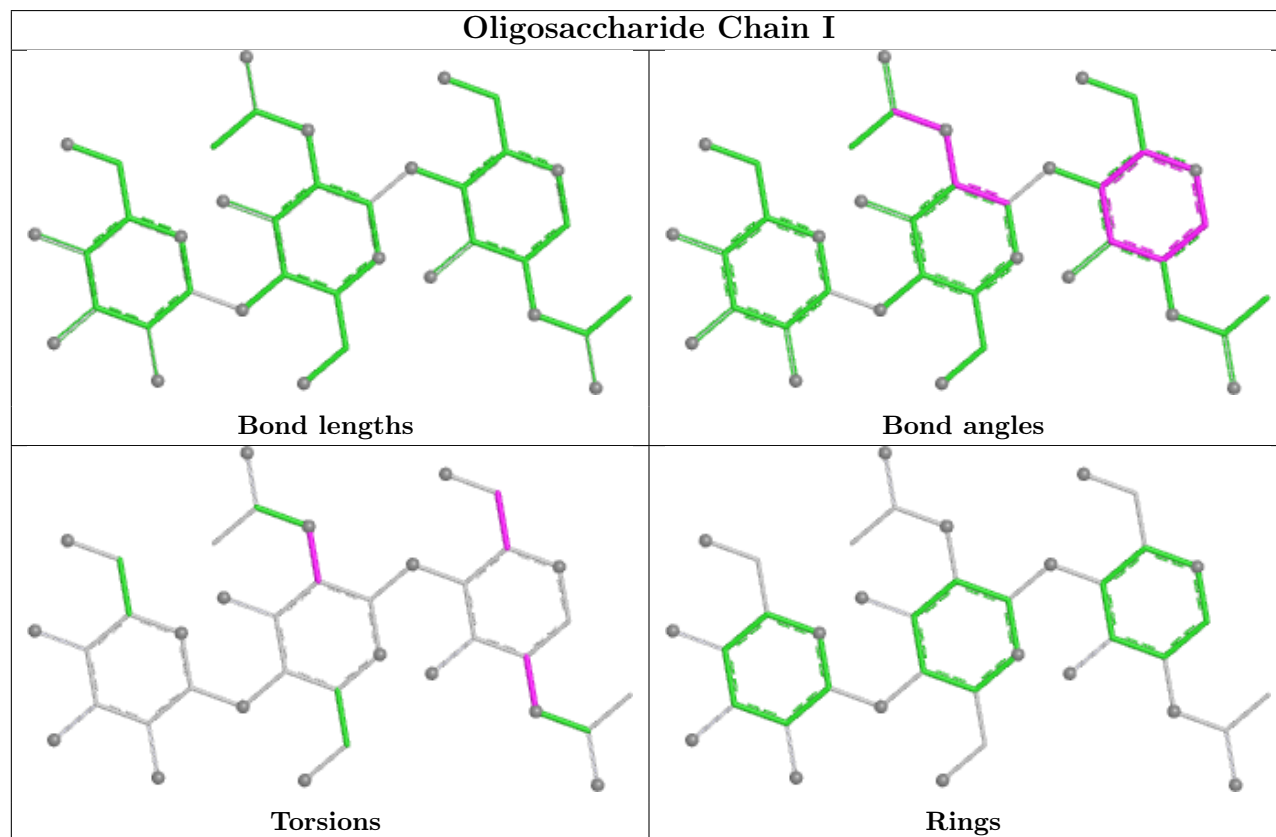
Mol	Chain	Res	Type	Atoms
6	I	2	NAG	C3-C2-N2-C7
6	J	1	NAG	C3-C2-N2-C7
6	J	1	NAG	C8-C7-N2-C2
6	I	1	NAG	C1-C2-N2-C7
6	J	1	NAG	O7-C7-N2-C2

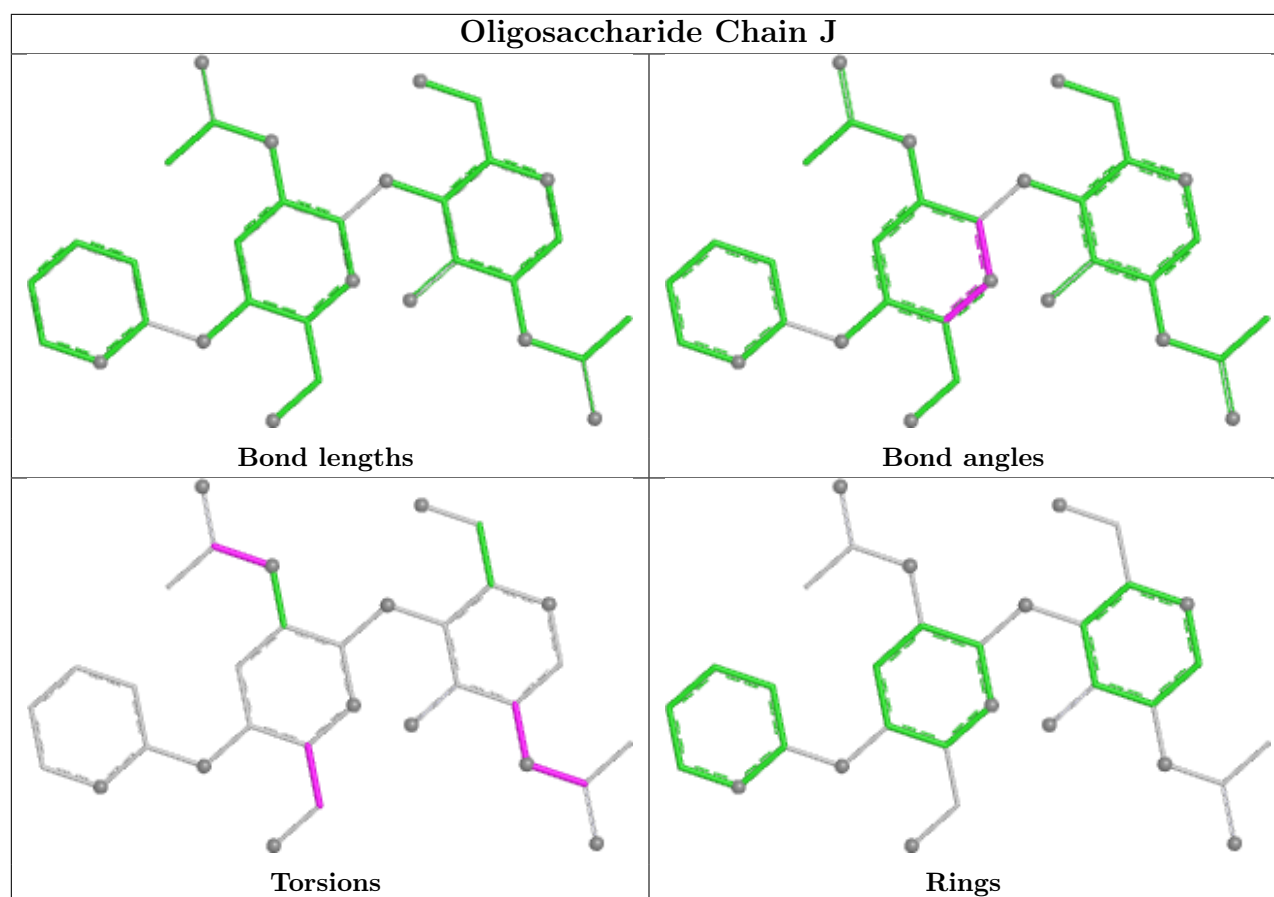
There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	J	1	NAG	2	0
6	J	2	NAG	1	0
6	I	1	NAG	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.





5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
7	NAG	A	301	1	14,14,15	0.37	0	17,19,21	0.95	1 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	A	301	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	301	NAG	C2-N2-C7	3.43	127.50	122.90

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	301	NAG	C3-C2-N2-C7
7	A	301	NAG	C8-C7-N2-C2
7	A	301	NAG	O7-C7-N2-C2

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

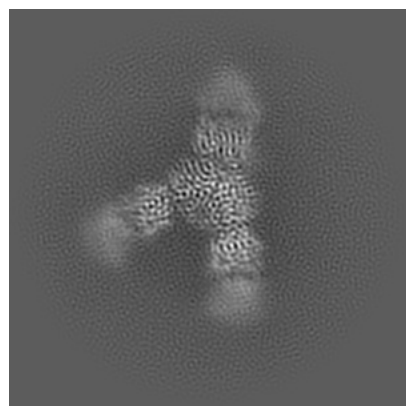
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-45427. These allow visual inspection of the internal detail of the map and identification of artifacts.

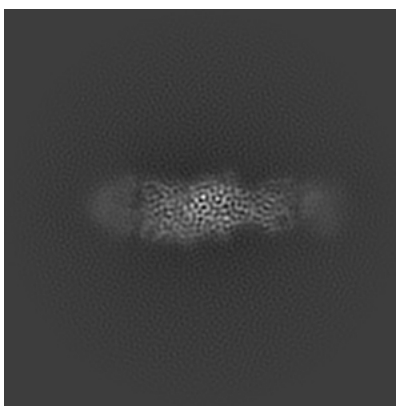
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

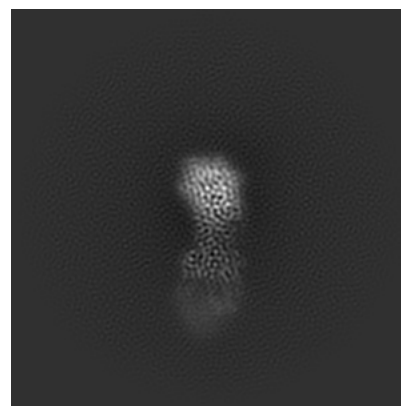
6.1.1 Primary map



X

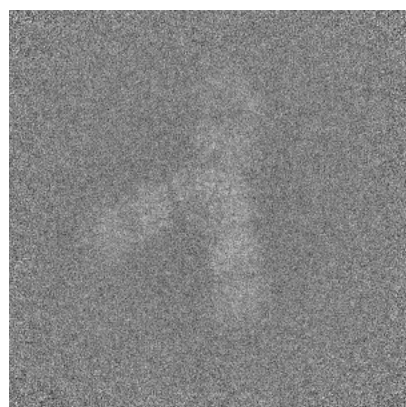


Y

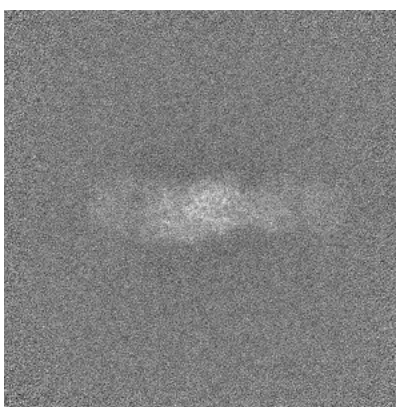


Z

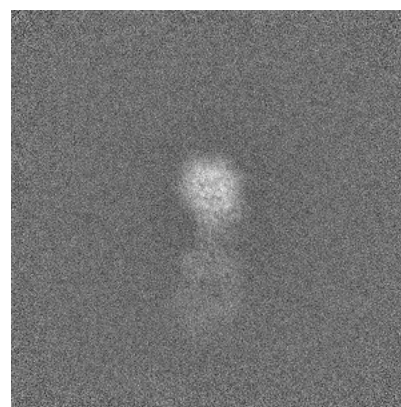
6.1.2 Raw map



X



Y

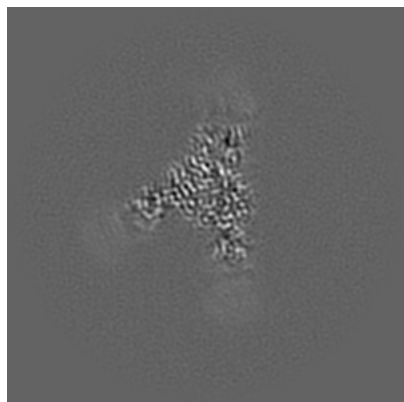


Z

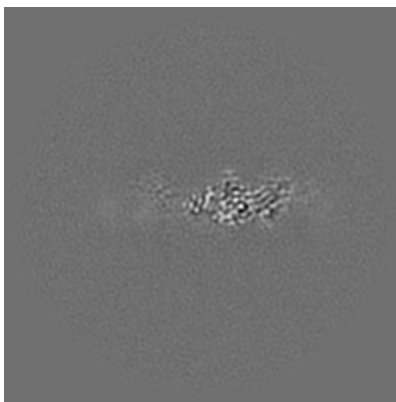
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

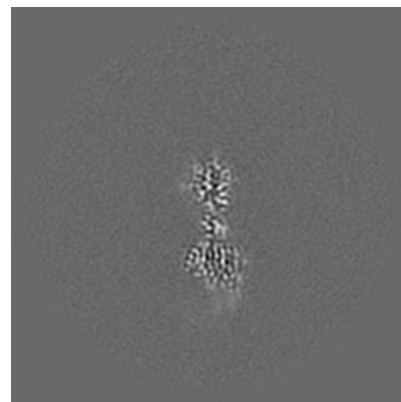
6.2.1 Primary map



X Index: 343

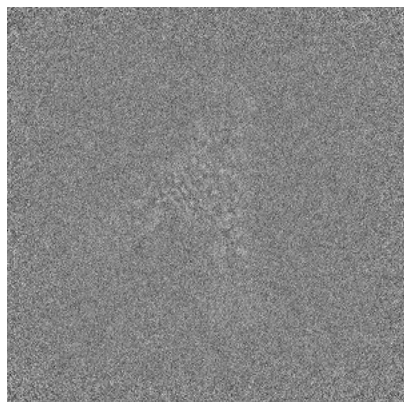


Y Index: 343

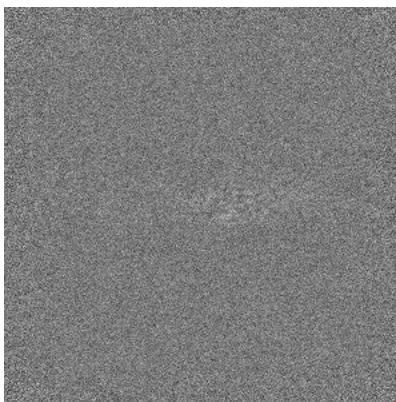


Z Index: 343

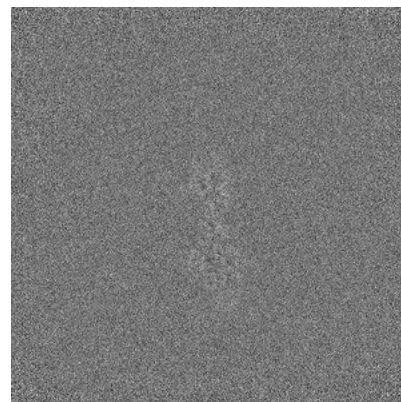
6.2.2 Raw map



X Index: 343



Y Index: 343

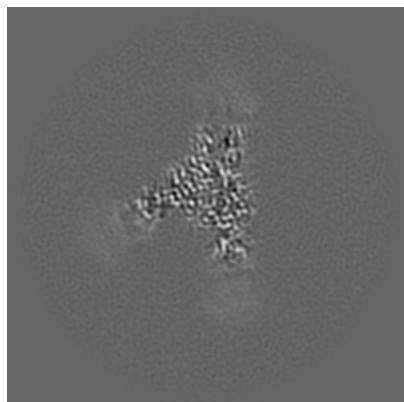


Z Index: 343

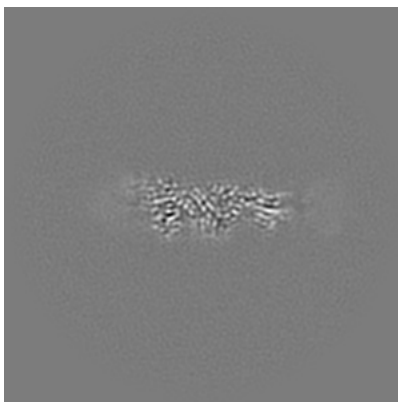
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

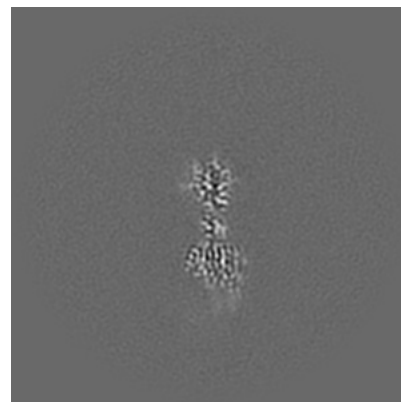
6.3.1 Primary map



X Index: 344

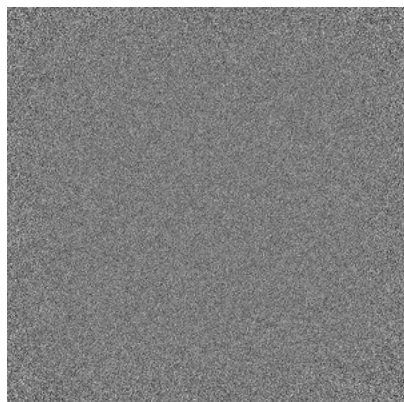


Y Index: 378

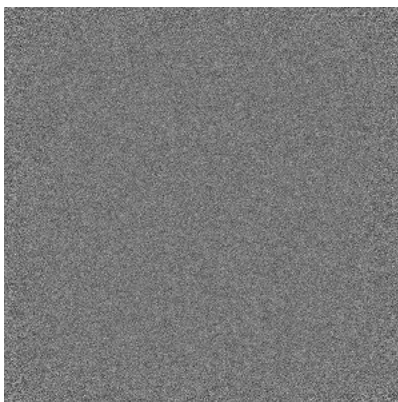


Z Index: 342

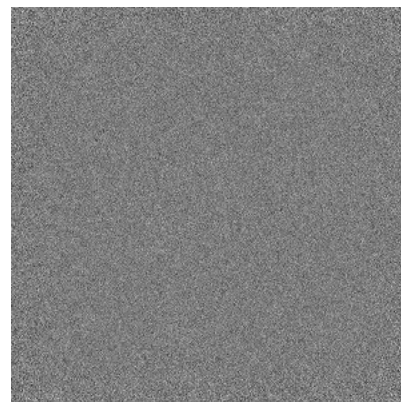
6.3.2 Raw map



X Index: 0



Y Index: 0

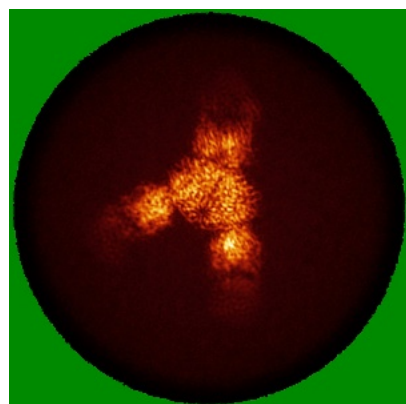


Z Index: 0

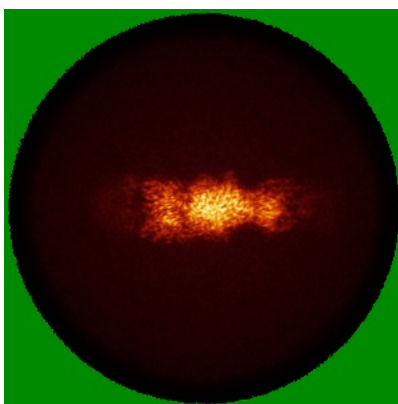
The images above show the largest variance slices of the map in three orthogonal directions.

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

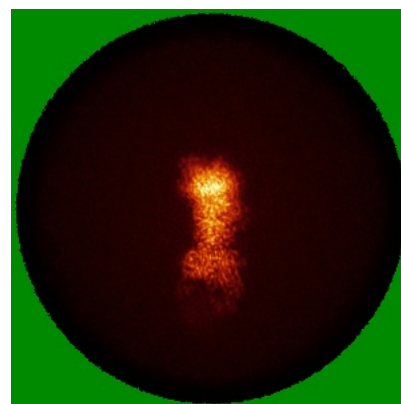
6.4.1 Primary map



X

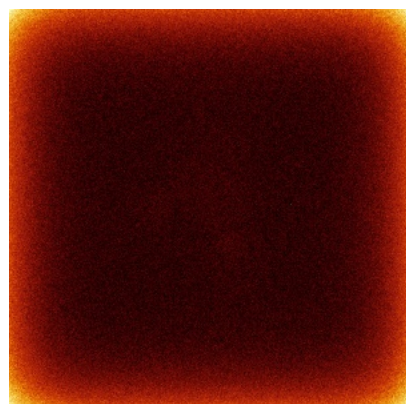


Y

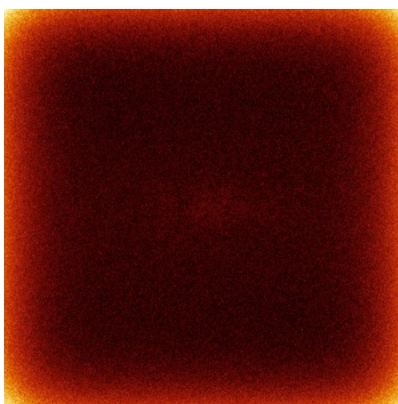


Z

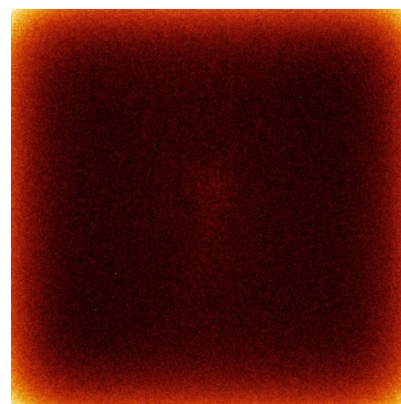
6.4.2 Raw map



X



Y

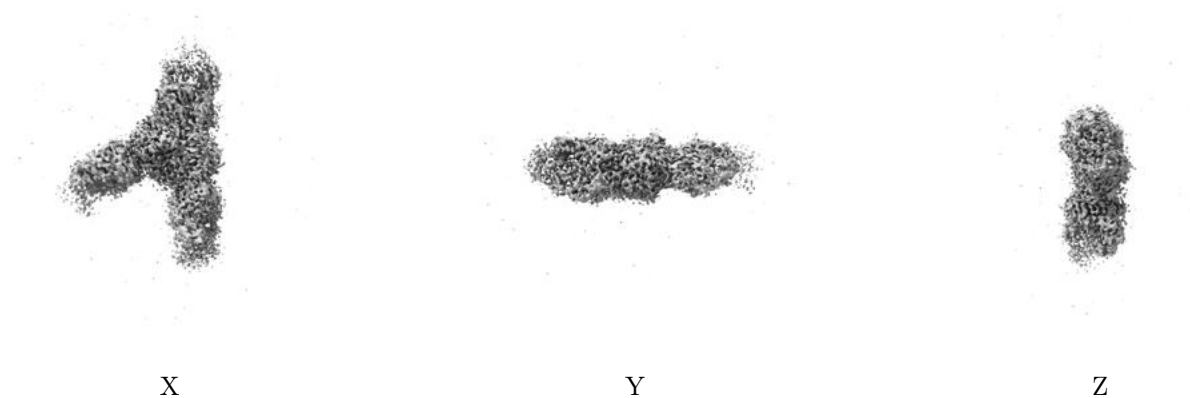


Z

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.

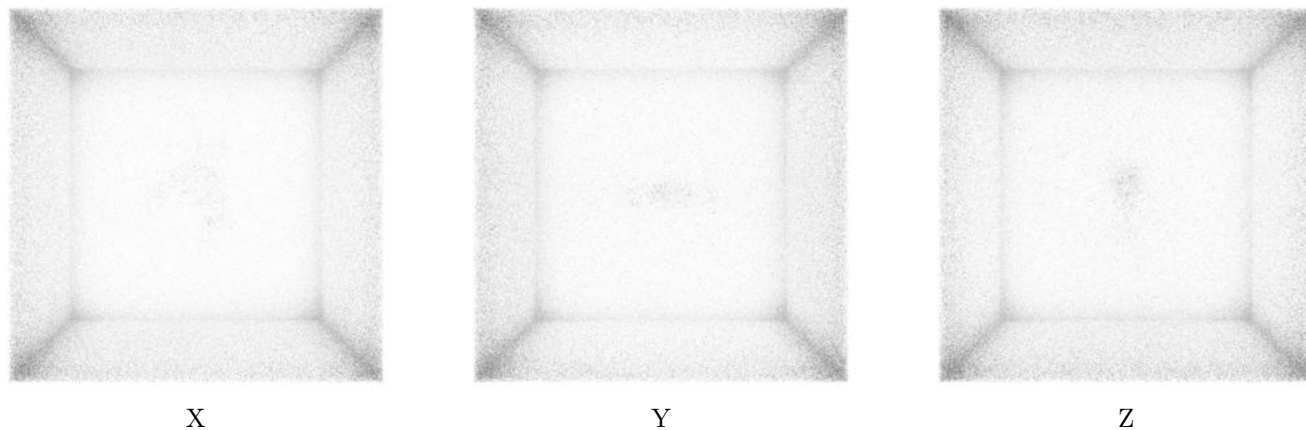
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0221. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

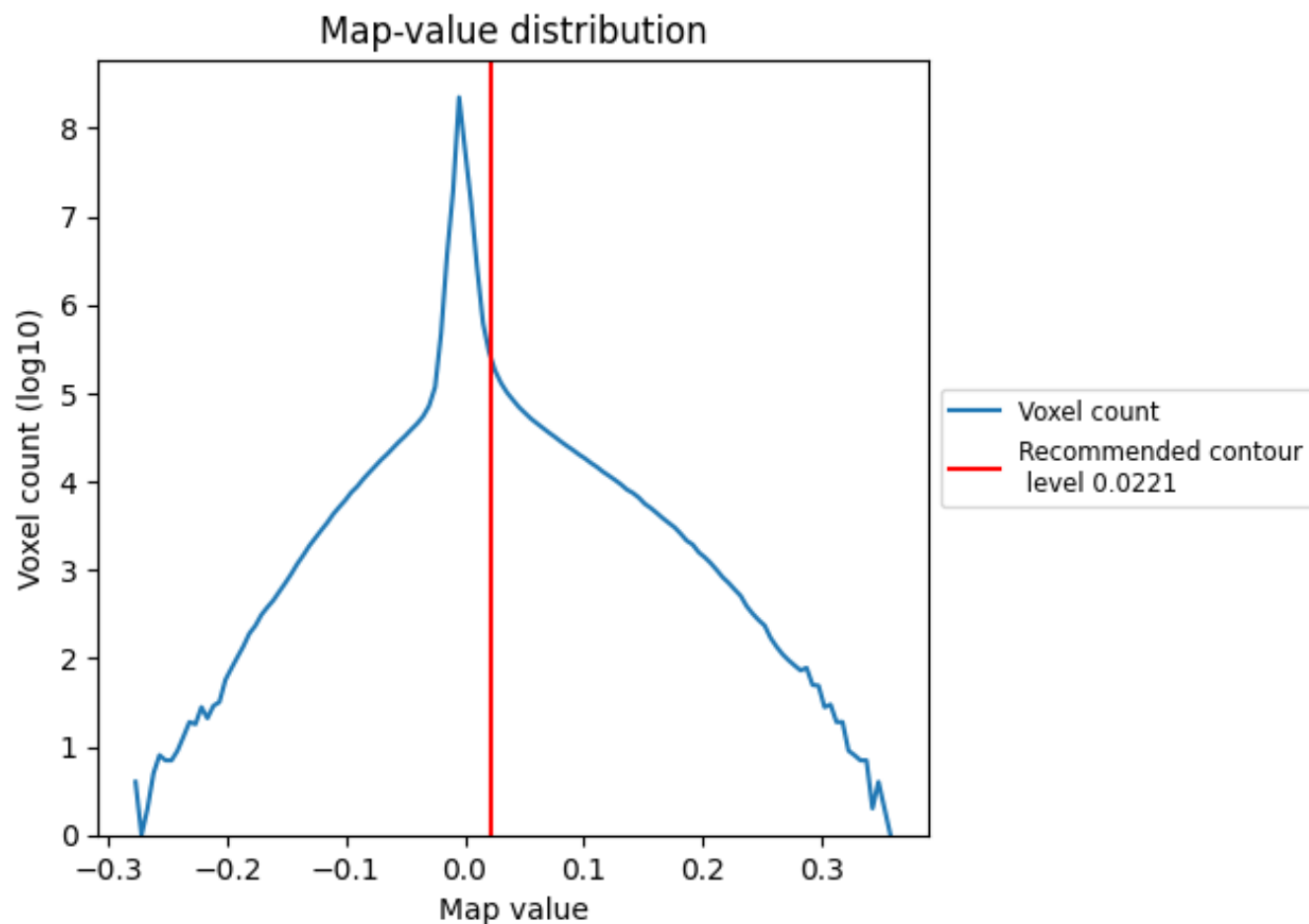
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

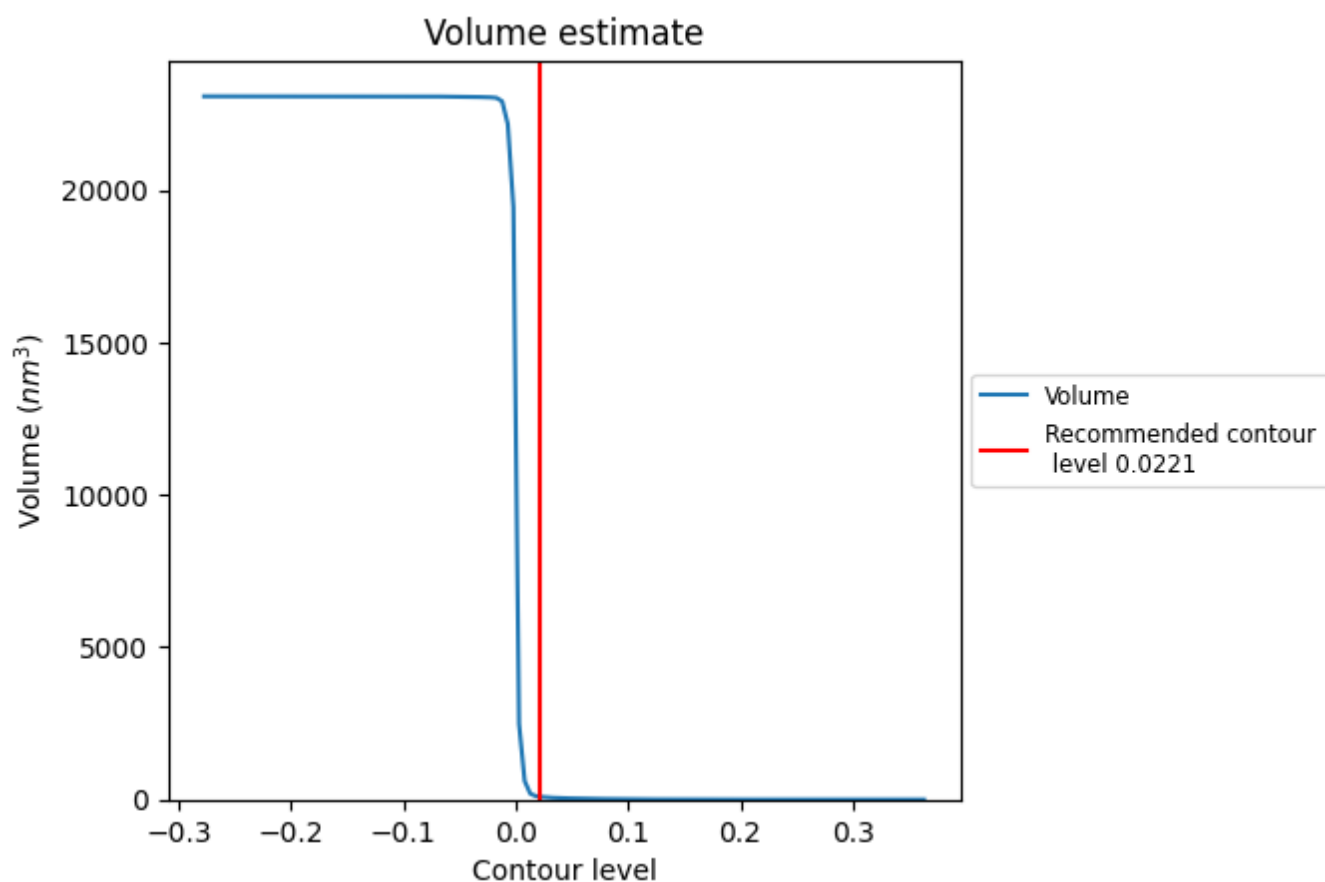
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

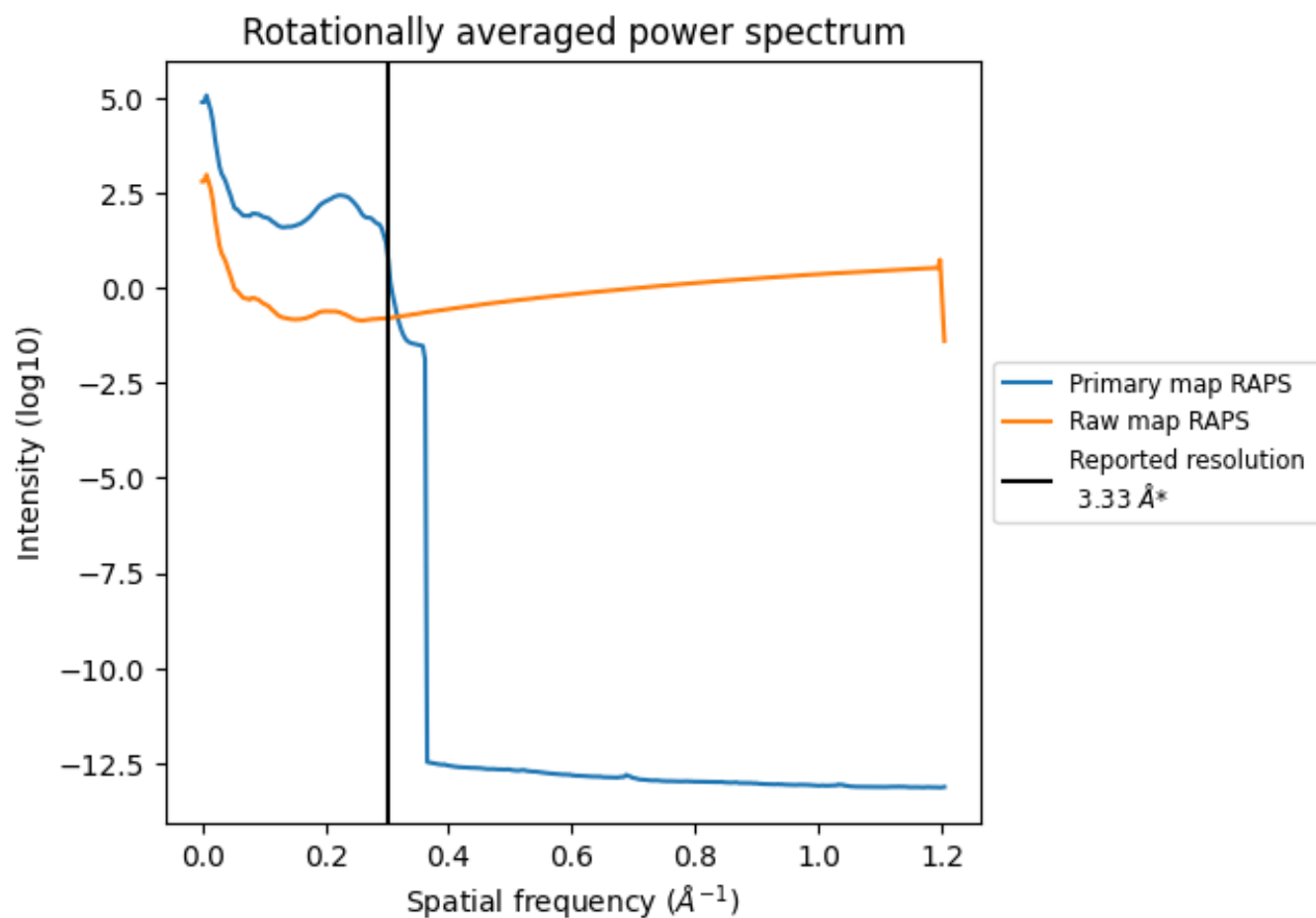
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 91 nm³; this corresponds to an approximate mass of 82 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 ⓘ

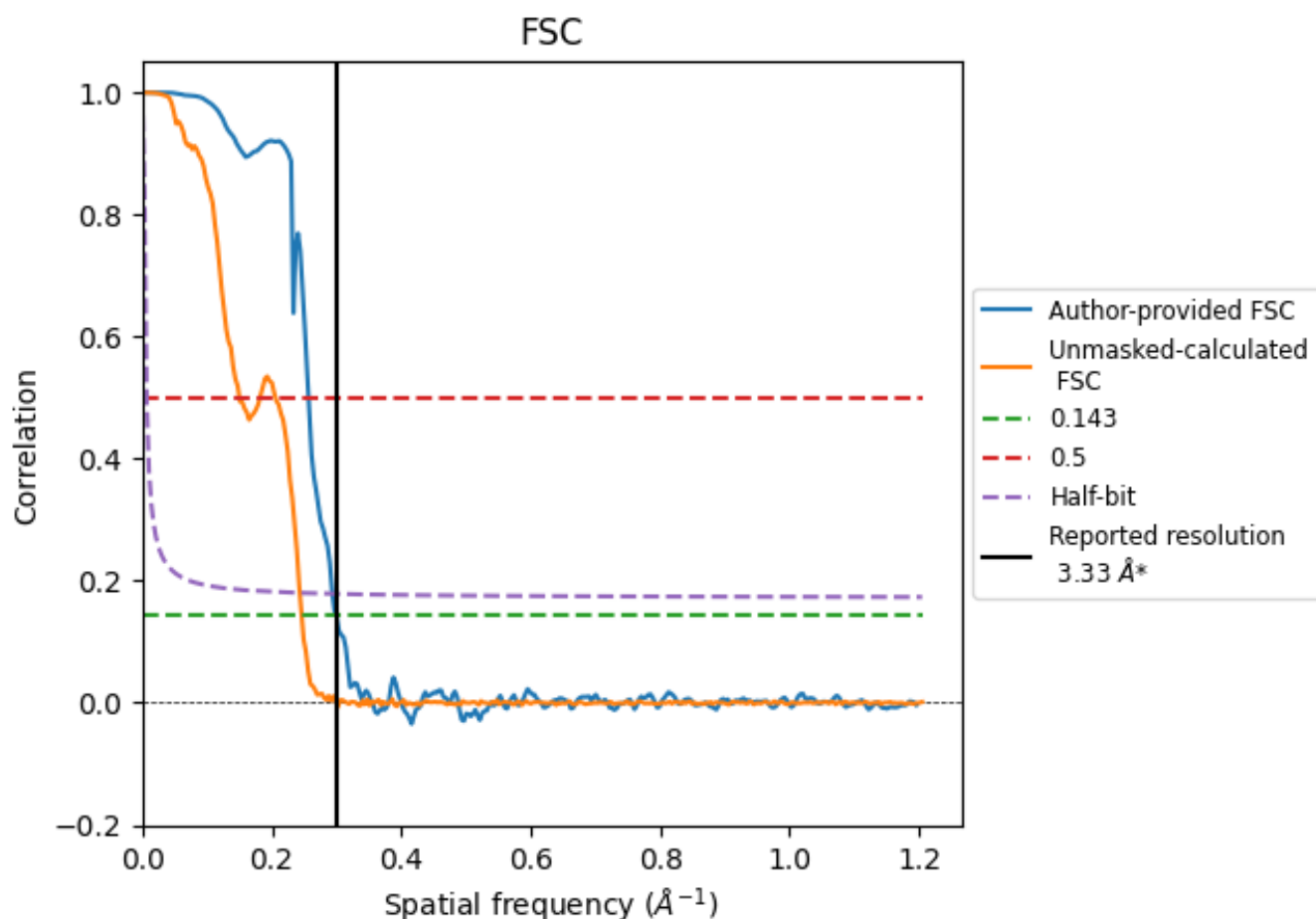


*Reported resolution corresponds to spatial frequency of 0.300 Å⁻¹

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 0.300 Å⁻¹

8.2 Resolution estimates [i](#)

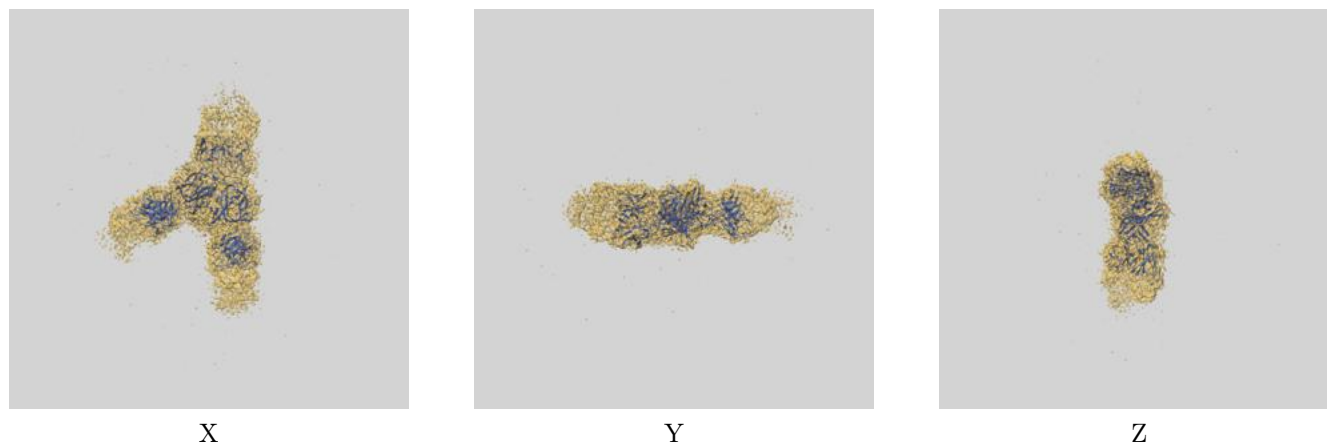
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.33	-	-
Author-provided FSC curve	3.33	3.90	3.40
Unmasked-calculated*	4.06	6.66	4.11

*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 4.06 differs from the reported value 3.33 by more than 10 %

9 Map-model fit [i](#)

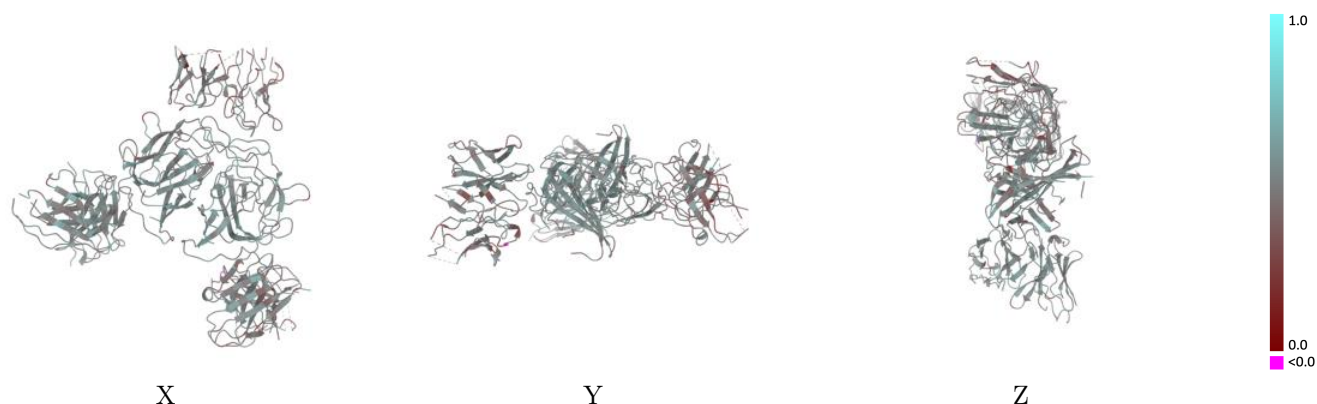
This section contains information regarding the fit between EMDB map EMD-45427 and PDB model 9CBN. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



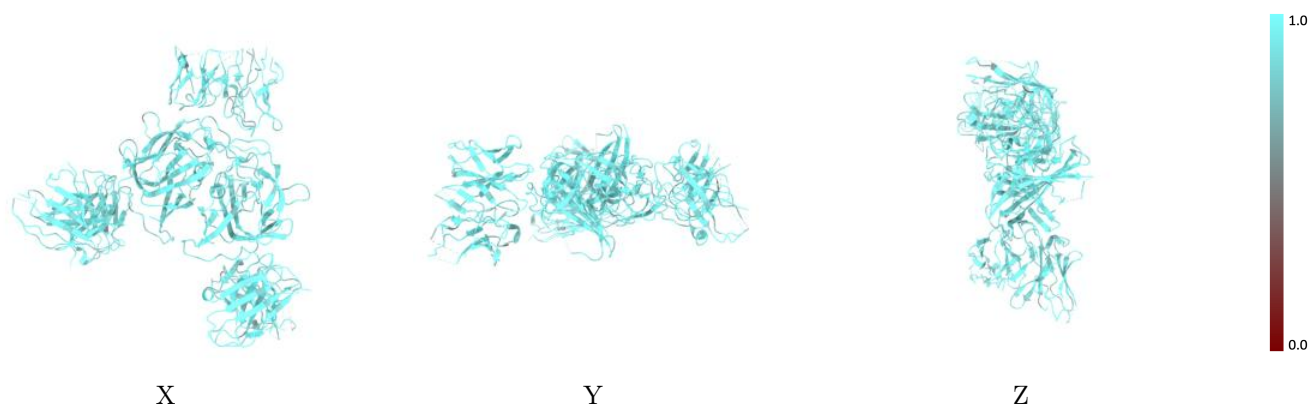
The images above show the 3D surface view of the map at the recommended contour level 0.0221 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



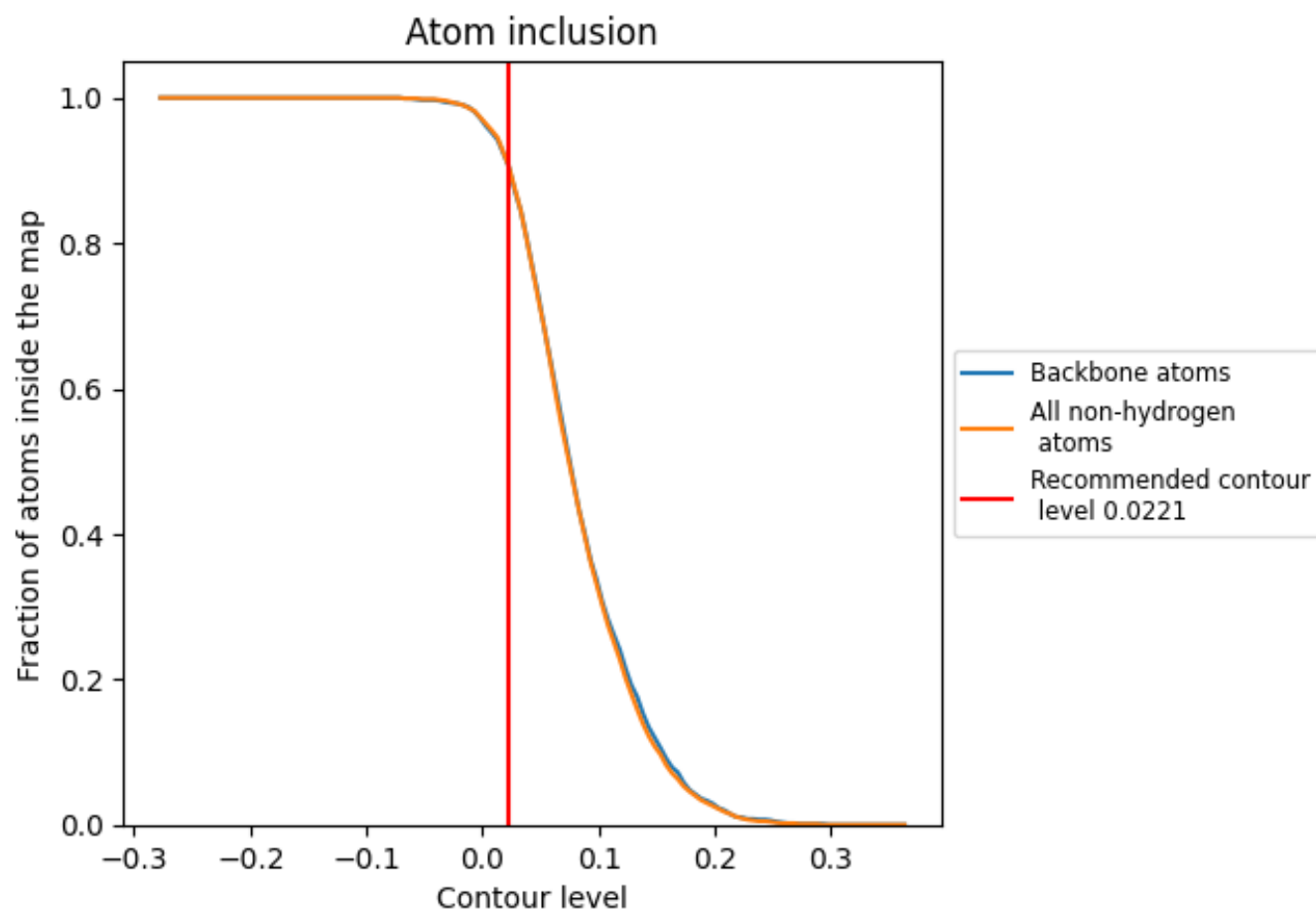
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0221).

9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 91% 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 (0.0221) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.9080	<div></div> 0.4890
A	<div></div> 0.8730	<div></div> 0.4360
B	<div></div> 0.9000	<div></div> 0.4530
C	<div></div> 0.9170	<div></div> 0.5120
D	<div></div> 0.9290	<div></div> 0.5150
E	<div></div> 0.9410	<div></div> 0.4850
F	<div></div> 0.8960	<div></div> 0.4530
G	<div></div> 0.9150	<div></div> 0.5060
H	<div></div> 0.9070	<div></div> 0.4970
I	<div></div> 0.7440	<div></div> 0.3170
J	<div></div> 0.9090	<div></div> 0.3870

1.0

0.0

<0.0