



Full wwPDB EM Validation Report ⓘ

Aug 3, 2026 – 11:45 AM JST

PDB ID : 9W6H / pdb_00009w6h
EMDB ID : EMD-65691
Title : Cryo-EM structure of a stacked human nucleosome core particle dimer (type 3) assembled with DNA truncated at SHL-5.5
Authors : Mu, Z.; Huang, J.
Deposited on : 2025-08-04
Resolution : 7.61 Å(reported)

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

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

A user guide is available at

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

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev133
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

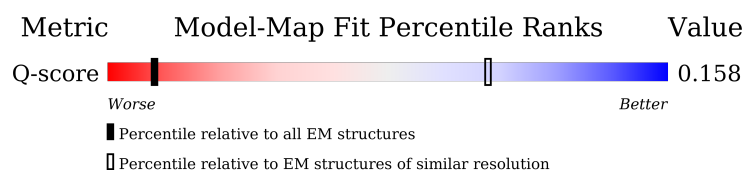
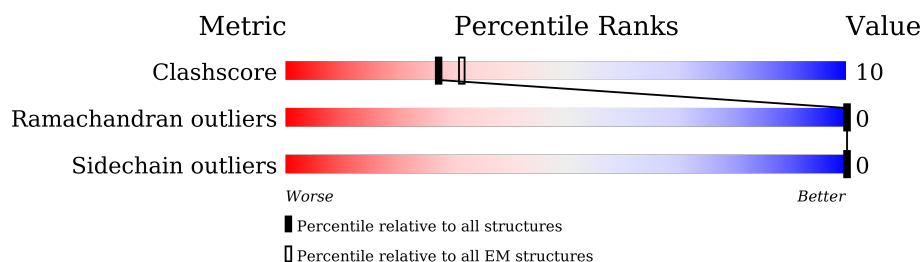
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 7.61 Å.

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



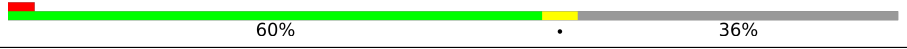
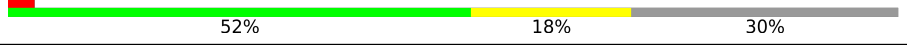
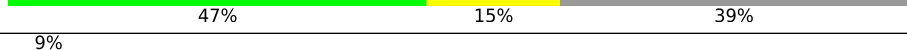
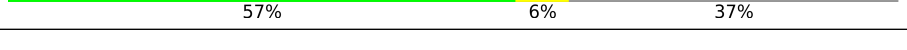
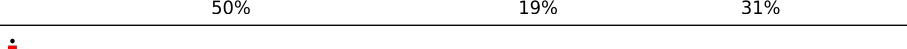
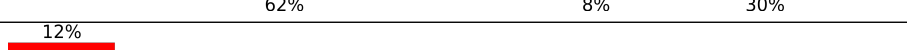
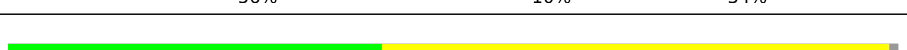
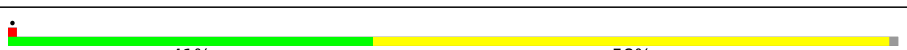
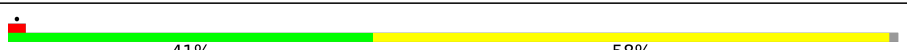
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	356 (7.13 - 8.11)

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	135	
1	E	135	
1	K	135	
1	O	135	

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Mol	Chain	Length	Quality of chain
2	B	102	
2	F	102	
2	L	102	
2	P	102	
3	C	129	
3	G	129	
3	M	129	
3	Q	129	
4	D	125	
4	H	125	
4	N	125	
4	R	125	
5	I	129	
5	S	129	
6	J	129	
6	T	129	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 21228 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 Histone H3.1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	95	Total	C	N	O	S	0	0
			783	494	150	135	4		
1	E	95	Total	C	N	O	S	0	0
			783	494	150	135	4		
1	K	96	Total	C	N	O	S	0	0
			790	499	151	136	4		
1	O	95	Total	C	N	O	S	0	0
			783	494	150	135	4		

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	77	Total	C	N	O	S	0	0
			614	389	119	105	1		
2	F	77	Total	C	N	O	S	0	0
			614	389	119	105	1		
2	L	65	Total	C	N	O	S	0	0
			520	328	102	89	1		
2	P	71	Total	C	N	O	S	0	0
			570	361	111	97	1		

- Molecule 3 is a protein called Histone H2A type 1-D.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	C	83	Total	C	N	O	0	0
			641	403	124	114		
3	G	91	Total	C	N	O	0	0
			704	446	134	124		
3	M	79	Total	C	N	O	0	0
			611	383	119	109		
3	Q	81	Total	C	N	O	0	0
			626	394	121	111		

- Molecule 4 is a protein called Histone H2B type 2-E.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	86	Total	C	N	O	S	0	0
			667	421	119	125	2		
4	H	88	Total	C	N	O	S	0	0
			688	435	121	130	2		
4	N	89	Total	C	N	O	S	0	0
			691	436	122	131	2		
4	R	83	Total	C	N	O	S	0	0
			647	409	116	120	2		

- Molecule 5 is a DNA chain called DNA (129-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	128	Total	C	N	O	P	0	0
			2639	1247	496	768	128		
5	S	128	Total	C	N	O	P	0	0
			2639	1247	496	768	128		

- Molecule 6 is a DNA chain called DNA (129-MER).

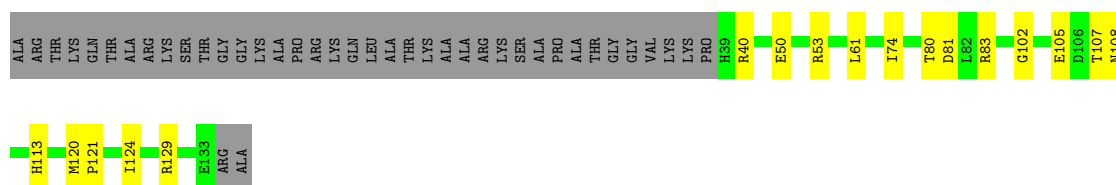
Mol	Chain	Residues	Atoms					AltConf	Trace
6	J	128	Total	C	N	O	P	0	0
			2609	1237	476	768	128		
6	T	128	Total	C	N	O	P	0	0
			2609	1237	476	768	128		

3 Residue-property plots [i](#)

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

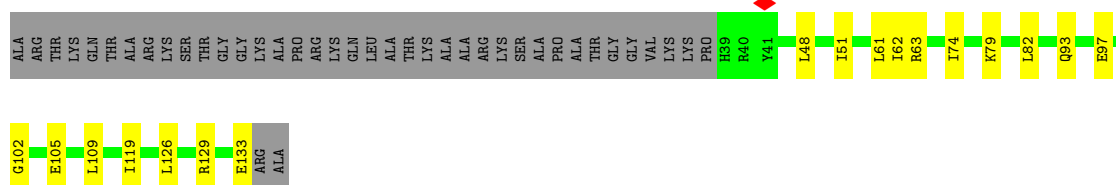
• Molecule 1: Histone H3.1

Chain A: 



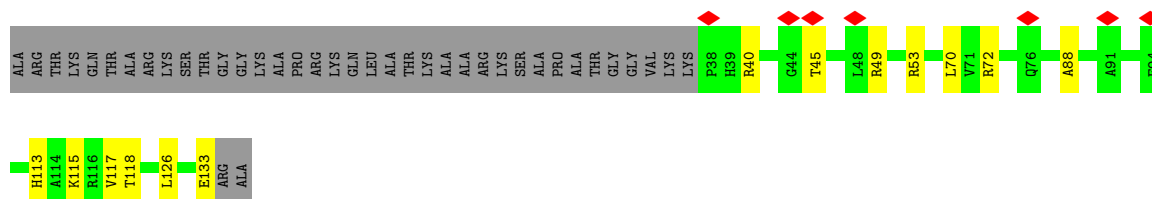
• Molecule 1: Histone H3.1

Chain E: 



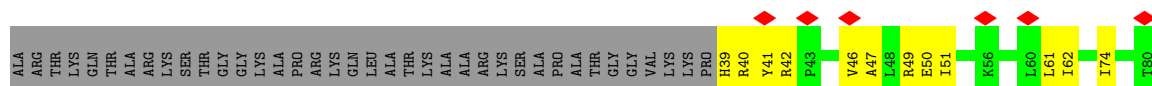
• Molecule 1: Histone H3.1

Chain K: 



• Molecule 1: Histone H3.1

Chain O: 

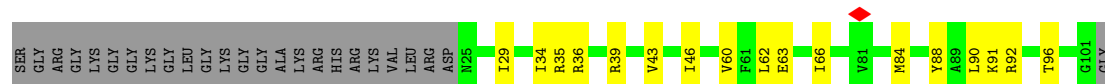




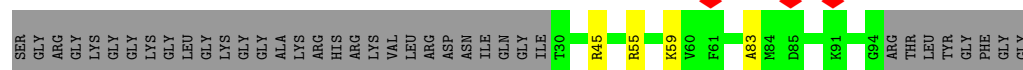
• Molecule 2: Histone H4



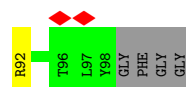
• Molecule 2: Histone H4



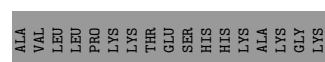
• Molecule 2: Histone H4



• Molecule 2: Histone H4



• Molecule 3: Histone H2A type 1-D



Chain G:

57% 14% 29%

SER GLY ARG GLY LYS GLN GLY GLY LYS LYS ARG ALA LYS THR ARG SER SER ARG ALA G22 G23 R32 R35 E41 A70 R77 I78 I79 P80 R81 R82 L83 Q84 D90 E91 E92 L93 N94 V100 T101 I102 G105 Q112 VAL LEU LEU PRO

Chain M:

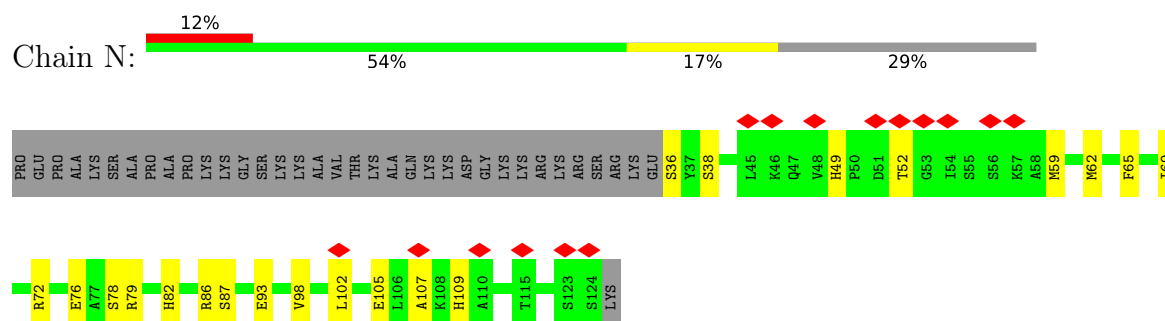
Amino Acid	Category
SER	Grey
GLY	Green
ARG	Green
GLY	Green
LYS	Green
GLN	Green
GLY	Green
LYS	Green
ALA	Green
ARG	Green
ALA	Green
LYS	Green
THR	Green
ARG	Green
SER	Green
SER	Green
ARG	Green
ALA	Green
GLY	Green
LEU	Green
GLN	Green
PHE	Green
PRO	Grey
VAL	Grey
G28	Green
R29	Green
V30	Yellow
K36	Yellow
G37	Green
N38	Green
Y39	Yellow
S40	Yellow
E41	Green
R42	Green
V43	Green
G44	Green
A45	Green
G46	Green
L51	Yellow
A52	Green
A53	Green
V54	Yellow
L55	Green
L58	Yellow
T62	Green
L63	Green
E64	Green
L65	Green
A66	Green
G67	Green
N68	Green
A69	Green
A70	Green
R71	Yellow
D72	Green
K75	Yellow
T76	Green
R77	Green
I78	Green
I79	Green
Q84	Yellow
I87	Green
R88	Green
N89	Green
D90	Green
E91	Green
E92	Green
L93	Green
N94	Green
K95	Green
L96	Green
L97	Green
V100	Yellow
G106	Yellow
VAL	Grey
LEU	Grey
PRO	Grey
ASN	Grey
ILE	Grey
GLN	Grey
ALA	Grey
VAL	Grey
LEU	Grey
LEU	Grey
PRO	Grey
LYS	Grey
THR	Grey
GLU	Grey
SER	Grey
HIS	Grey
HIS	Grey
LYS	Grey
ALA	Grey
LYS	Grey
GLY	Grey
LYS	Grey

Chain Q:

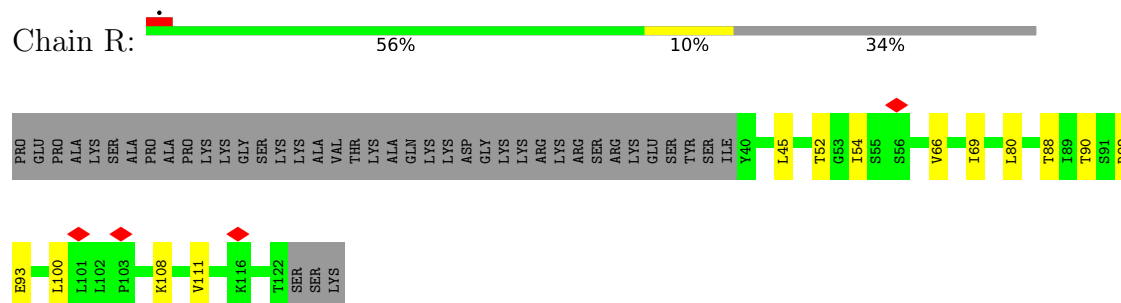
Chain D:

Chain H:

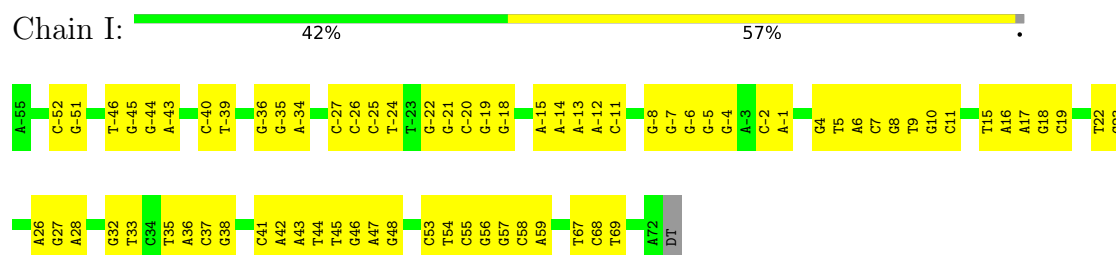
- Molecule 4: Histone H2B type 2-E



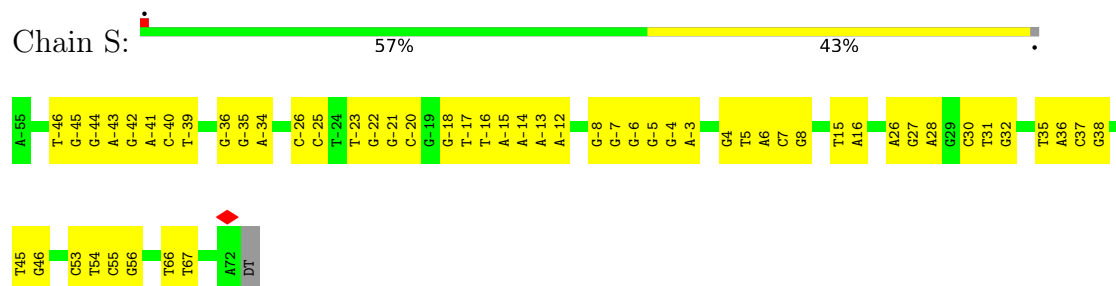
- Molecule 4: Histone H2B type 2-E



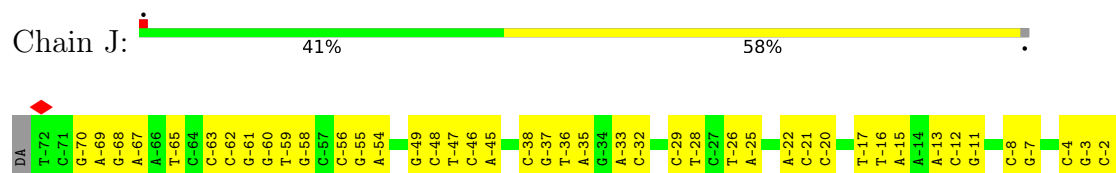
- Molecule 5: DNA (129-MER)

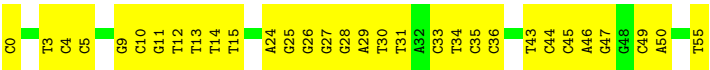


- Molecule 5: DNA (129-MER)

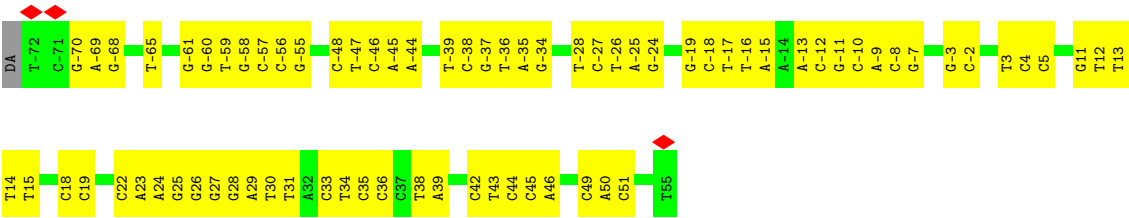


- Molecule 6: DNA (129-MER)





• Molecule 6: DNA (129-MER)



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21877	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)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.020	Depositor
Minimum map value	-0.008	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.004	Depositor
Map size (Å)	281.6, 281.6, 281.6	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	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	0.10	0/794	0.29	0/1065
1	E	0.11	0/794	0.33	0/1065
1	K	0.09	0/802	0.26	0/1076
1	O	0.12	0/794	0.35	0/1065
2	B	0.10	0/621	0.26	0/832
2	F	0.10	0/621	0.28	0/832
2	L	0.08	0/525	0.23	0/703
2	P	0.13	0/576	0.37	0/772
3	C	0.10	0/648	0.28	0/874
3	G	0.10	0/713	0.30	0/963
3	M	0.11	0/617	0.30	0/830
3	Q	0.10	0/632	0.24	0/851
4	D	0.13	0/677	0.35	0/912
4	H	0.10	0/699	0.25	0/942
4	N	0.09	0/702	0.23	0/946
4	R	0.09	0/657	0.23	0/885
5	I	0.17	0/2963	0.36	0/4575
5	S	0.18	0/2963	0.36	0/4575
6	J	0.17	0/2923	0.32	0/4505
6	T	0.18	0/2923	0.33	0/4505
All	All	0.15	0/22644	0.32	0/32773

There are no bond length outliers.

There are no bond angle outliers.

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	783	0	818	16	0
1	E	783	0	818	15	0
1	K	790	0	826	11	0
1	O	783	0	818	21	0
2	B	614	0	656	17	0
2	F	614	0	656	13	0
2	L	520	0	562	5	0
2	P	570	0	616	18	0
3	C	641	0	678	14	0
3	G	704	0	744	13	0
3	M	611	0	645	14	0
3	Q	626	0	665	7	0
4	D	667	0	689	20	0
4	H	688	0	704	7	0
4	N	691	0	708	15	0
4	R	647	0	668	12	0
5	I	2639	0	1435	58	0
5	S	2639	0	1435	42	0
6	J	2609	0	1435	54	0
6	T	2609	0	1435	63	0
All	All	21228	0	17011	375	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 10.

All (375) 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)
5:I:9:DT:H2'	5:I:10:DG:C8	2.25	0.72
1:E:63:ARG:HD3	5:I:17:DA:H4'	1.71	0.70
1:O:40:ARG:HD2	1:O:42:ARG:HH21	1.58	0.69
1:A:129:ARG:HE	1:E:109:LEU:HD21	1.58	0.68
1:A:80:THR:HG22	1:A:81:ASP:H	1.59	0.67
3:G:79:ILE:HG22	3:G:82:HIS:HD1	1.58	0.67
1:A:107:THR:HG21	1:A:124:ILE:HG13	1.78	0.66
6:J:11:DG:H2''	6:J:12:DT:H5'	1.77	0.64
5:S:-18:DG:H2''	5:S:-17:DT:H5''	1.79	0.64
3:Q:71:ARG:NH1	4:R:52:THR:OG1	2.30	0.64
1:A:50:GLU:HA	1:A:53:ARG:HG2	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:-22:DG:H2'	5:I:-21:DG:C8	2.33	0.64
6:J:-49:DG:C8	6:J:-49:DG:H5'	2.33	0.63
6:T:-59:DT:H2''	6:T:-58:DG:C8	2.34	0.62
5:S:66:DT:H2''	5:S:67:DT:C5	2.34	0.62
5:I:-26:DC:H2''	5:I:-25:DC:C5	2.34	0.62
5:S:-36:DG:H2''	5:S:-35:DG:N7	2.15	0.61
3:G:90:ASP:O	3:G:94:ASN:ND2	2.32	0.61
5:S:-40:DC:H3'	5:S:-39:DT:H71	1.81	0.61
5:I:-22:DG:H2'	5:I:-21:DG:H8	1.65	0.60
6:T:29:DA:H2'	6:T:30:DT:H71	1.82	0.60
2:F:91:LYS:HG3	2:F:96:THR:HG22	1.82	0.60
6:T:3:DT:H4'	6:T:4:DC:H5'	1.84	0.60
5:I:9:DT:H2'	5:I:10:DG:H8	1.67	0.59
1:A:83:ARG:NH2	2:B:80:THR:OG1	2.36	0.59
4:N:86:ARG:NH1	4:N:93:GLU:OE2	2.35	0.59
3:M:84:GLN:HG2	3:M:106:GLY:H	1.66	0.59
1:K:70:LEU:HD11	2:L:59:LYS:HE3	1.85	0.59
1:E:93:GLN:O	1:E:97:GLU:HG2	2.03	0.59
1:A:53:ARG:NH2	6:J:-65:DT:OP1	2.36	0.58
1:A:108:ASN:HB2	2:B:43:VAL:HG12	1.84	0.58
2:B:64:ASN:OD1	2:B:67:ARG:NH2	2.35	0.58
1:O:88:ALA:HB1	2:P:86:VAL:HG21	1.85	0.58
4:D:58:ALA:HB1	4:D:62:MET:HE1	1.85	0.58
4:H:101:LEU:HD12	4:H:102:LEU:HB2	1.86	0.58
2:F:92:ARG:HH22	4:H:101:LEU:HA	1.69	0.58
5:I:-46:DT:H2''	5:I:-45:DG:C8	2.39	0.58
2:P:35:ARG:NH1	5:S:8:DG:OP2	2.37	0.58
4:N:38:SER:HA	4:N:59:MET:HE1	1.85	0.57
2:F:39:ARG:NH1	2:F:43:VAL:O	2.36	0.57
5:I:-8:DG:H2''	5:I:-7:DG:H5''	1.84	0.57
4:N:76:GLU:OE2	4:N:79:ARG:NH2	2.37	0.57
5:I:53:DC:H2'	5:I:54:DT:H71	1.87	0.57
5:I:-5:DG:H2''	5:I:-4:DG:N7	2.18	0.57
5:I:67:DT:H2''	5:I:68:DC:C5	2.40	0.57
5:S:-46:DT:H2''	5:S:-45:DG:N7	2.19	0.57
1:A:61:LEU:O	2:B:36:ARG:NH2	2.38	0.57
2:B:62:LEU:HA	2:B:65:VAL:HG22	1.87	0.57
5:I:15:DT:H2''	5:I:16:DA:N7	2.19	0.56
3:G:77:ARG:HH21	3:G:78:ILE:HG12	1.70	0.56
5:I:-40:DC:H3'	5:I:-39:DT:H71	1.86	0.56
5:I:-36:DG:H2''	5:I:-35:DG:N7	2.20	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:5:DT:H2''	5:I:6:DA:N7	2.19	0.56
5:S:-26:DC:H2''	5:S:-25:DC:C5	2.40	0.56
5:I:68:DC:H2''	5:I:69:DT:C5	2.40	0.56
6:J:-8:DC:H2''	6:J:-7:DG:C8	2.40	0.56
1:O:97:GLU:HA	1:O:100:LEU:HG	1.88	0.56
6:J:-29:DC:H2''	6:J:-28:DT:C5	2.40	0.56
3:M:30:VAL:HB	3:M:51:LEU:HD11	1.88	0.56
3:C:82:HIS:HA	3:C:85:LEU:HD12	1.88	0.55
6:J:-59:DT:H2''	6:J:-58:DG:C8	2.41	0.55
3:Q:35:ARG:NH2	3:Q:40:SER:O	2.38	0.55
3:M:64:GLU:OE1	4:N:49:HIS:ND1	2.38	0.55
6:J:-37:DG:H2''	6:J:-36:DT:C5	2.42	0.55
1:K:45:THR:HG22	1:K:49:ARG:HE	1.72	0.55
4:N:36:SER:N	6:T:49:DC:OP1	2.39	0.55
6:T:14:DT:H2''	6:T:15:DT:C5	2.42	0.55
1:O:83:ARG:HB2	2:P:80:THR:HA	1.88	0.55
3:G:79:ILE:HG13	3:G:80:PRO:HD2	1.88	0.54
3:C:63:LEU:HD12	4:D:44:VAL:HG13	1.88	0.54
1:A:120:MET:HE3	1:A:120:MET:HA	1.89	0.54
1:K:53:ARG:NH2	6:T:-65:DT:OP1	2.42	0.53
6:T:4:DC:H2''	6:T:5:DC:C5	2.43	0.53
1:O:121:PRO:HG2	2:P:49:LEU:HD23	1.91	0.53
4:N:62:MET:HE3	4:N:62:MET:HA	1.89	0.53
5:S:55:DC:H2''	5:S:56:DG:C8	2.44	0.53
6:J:-26:DT:H2''	6:J:-25:DA:C8	2.43	0.53
1:K:133:GLU:O	3:M:95:LYS:NZ	2.41	0.53
4:N:78:SER:O	4:N:82:HIS:ND1	2.42	0.53
1:O:51:ILE:HD11	2:P:42:GLY:HA2	1.89	0.53
5:I:55:DC:H2''	5:I:56:DG:C8	2.44	0.53
2:B:75:HIS:O	4:D:92:ARG:NH2	2.41	0.52
5:S:36:DA:H2''	5:S:37:DC:C4	2.44	0.52
1:O:85:GLN:NE2	6:T:-24:DG:OP1	2.43	0.52
5:S:15:DT:H2''	5:S:16:DA:N7	2.24	0.52
2:P:57:VAL:HA	2:P:60:VAL:HG12	1.91	0.52
1:O:46:VAL:HA	1:O:49:ARG:HG2	1.91	0.52
5:S:-8:DG:H2''	5:S:-7:DG:H5''	1.90	0.52
2:F:29:ILE:HD12	2:F:34:ILE:HD11	1.92	0.52
5:I:-35:DG:H2''	5:I:-34:DA:C8	2.44	0.52
6:J:3:DT:H4'	6:J:4:DC:H5'	1.91	0.52
6:T:45:DC:H2''	6:T:46:DA:N7	2.25	0.52
6:J:12:DT:H2''	6:J:13:DT:C4	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:T:-38:DC:H2''	6:T:-37:DG:C8	2.44	0.52
6:T:30:DT:H2'	6:T:31:DT:H71	1.92	0.52
3:G:79:ILE:HG23	3:G:81:ARG:H	1.75	0.51
3:Q:35:ARG:HH21	3:Q:43:VAL:HG23	1.75	0.51
5:I:36:DA:H2''	5:I:37:DC:C5	2.45	0.51
1:O:62:ILE:HD11	2:P:37:LEU:HD11	1.92	0.51
3:M:39:TYR:HB3	4:N:78:SER:HB3	1.91	0.51
5:S:37:DC:H2''	5:S:38:DG:N7	2.26	0.51
2:B:96:THR:HB	3:G:100:VAL:HG22	1.93	0.51
3:M:71:ARG:NH2	4:N:52:THR:OG1	2.43	0.51
6:T:-26:DT:H2''	6:T:-25:DA:C8	2.45	0.51
5:I:-13:DA:H2''	5:I:-12:DA:N7	2.26	0.51
5:S:-13:DA:C8	5:S:-13:DA:H5'	2.46	0.51
6:J:-59:DT:H2''	6:J:-58:DG:N7	2.25	0.51
3:Q:78:ILE:HD11	4:R:54:ILE:HG13	1.91	0.51
6:T:-16:DT:H2''	6:T:-15:DA:N7	2.25	0.51
6:J:25:DG:H2''	6:J:26:DG:N7	2.25	0.51
6:T:-70:DG:H2''	6:T:-69:DA:C8	2.46	0.51
6:T:42:DC:H2'	6:T:43:DT:H71	1.93	0.51
6:J:-16:DT:H2''	6:J:-15:DA:N7	2.27	0.50
6:J:45:DC:H2''	6:J:46:DA:C8	2.46	0.50
5:S:-15:DA:H2''	5:S:-14:DA:N7	2.26	0.50
1:A:74:ILE:HG13	2:B:62:LEU:HD11	1.92	0.50
2:P:57:VAL:HG22	2:P:61:PHE:CZ	2.46	0.50
6:T:13:DT:H2''	6:T:14:DT:C5	2.46	0.50
4:H:102:LEU:O	4:H:107:ALA:HB2	2.12	0.50
5:S:-5:DG:H2''	5:S:-4:DG:N7	2.26	0.50
3:Q:78:ILE:HD11	4:R:54:ILE:HA	1.94	0.50
3:C:65:LEU:HA	3:C:68:ASN:HD21	1.76	0.50
5:I:-52:DC:H2''	5:I:-51:DG:C8	2.47	0.50
6:T:23:DA:H2''	6:T:24:DA:C8	2.45	0.50
6:T:42:DC:H2''	6:T:43:DT:H5'	1.93	0.50
3:C:85:LEU:HD23	3:C:108:LEU:HD22	1.92	0.50
6:J:-48:DC:H2''	6:J:-47:DT:C5	2.47	0.50
2:P:75:HIS:HE1	4:R:93:GLU:HA	1.76	0.50
5:S:36:DA:H2''	5:S:37:DC:C5	2.46	0.50
6:T:33:DC:H2''	6:T:34:DT:C6	2.46	0.50
2:B:70:VAL:HA	2:B:73:THR:HG22	1.94	0.49
3:G:81:ARG:NH1	3:G:105:GLY:O	2.45	0.49
6:T:24:DA:H2''	6:T:25:DG:C8	2.48	0.49
4:R:88:THR:OG1	6:T:-34:DG:OP1	2.28	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:90:THR:OG1	4:H:93:GLU:OE1	2.28	0.49
1:K:126:LEU:HD22	1:O:113:HIS:CG	2.48	0.49
4:D:116:LYS:HE2	4:D:116:LYS:HA	1.95	0.48
5:I:-25:DC:H2''	5:I:-24:DT:H73	1.95	0.48
5:I:22:DT:H2'	5:I:23:DG:H8	1.77	0.48
3:M:51:LEU:HA	3:M:54:VAL:HG22	1.94	0.48
5:S:-42:DG:H2'	5:S:-41:DA:C8	2.48	0.48
5:S:5:DT:H2''	5:S:6:DA:N7	2.28	0.48
6:T:-69:DA:H2''	6:T:-68:DG:C8	2.48	0.48
6:J:33:DC:H2''	6:J:34:DT:C6	2.49	0.48
5:S:-21:DG:H2'	5:S:-20:DC:C6	2.48	0.48
6:T:-48:DC:H2''	6:T:-47:DT:C5	2.48	0.48
6:T:-36:DT:H2''	6:T:-35:DA:C8	2.48	0.48
1:A:113:HIS:CD2	1:E:126:LEU:HD22	2.48	0.48
5:I:41:DC:H2'	5:I:42:DA:C8	2.48	0.48
5:S:45:DT:H2''	5:S:46:DG:N7	2.29	0.48
6:T:12:DT:H2''	6:T:13:DT:C5	2.48	0.48
4:D:73:ILE:HG22	4:D:101:LEU:HD22	1.95	0.48
1:E:61:LEU:HD13	2:F:36:ARG:HB3	1.95	0.48
6:T:-8:DC:H2''	6:T:-7:DG:C8	2.49	0.48
5:I:22:DT:H2'	5:I:23:DG:C8	2.48	0.48
6:J:49:DC:H2''	6:J:50:DA:C8	2.48	0.48
2:F:60:VAL:HA	2:F:63:GLU:HG2	1.96	0.47
5:I:-21:DG:H2'	5:I:-20:DC:C6	2.49	0.47
3:C:75:LYS:HZ3	3:C:78:ILE:HA	1.78	0.47
6:J:4:DC:H2''	6:J:5:DC:C5	2.49	0.47
1:K:117:VAL:HG12	2:L:45:ARG:HG3	1.96	0.47
5:I:-2:DC:H2''	5:I:-1:DA:C8	2.49	0.47
1:K:118:THR:HA	2:L:45:ARG:HB2	1.96	0.47
4:R:66:VAL:HA	4:R:69:ILE:HG12	1.95	0.47
5:S:-14:DA:H1'	5:S:-13:DA:C5	2.49	0.47
1:O:100:LEU:HD11	2:P:37:LEU:HD22	1.97	0.47
5:I:37:DC:H2''	5:I:38:DG:N7	2.28	0.47
2:P:75:HIS:CE1	4:R:93:GLU:HA	2.49	0.47
3:M:36:LYS:HD3	3:M:36:LYS:C	2.40	0.47
5:S:4:DG:H5'	5:S:4:DG:C8	2.50	0.47
5:S:35:DT:H2''	5:S:36:DA:C8	2.49	0.47
6:T:22:DC:H2''	6:T:23:DA:C8	2.50	0.47
6:T:27:DG:H2''	6:T:28:DG:H8	1.80	0.47
5:I:-45:DG:H2''	5:I:-44:DG:N7	2.30	0.47
6:T:18:DC:C2	6:T:19:DC:C5	3.03	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:-70:DG:H2''	6:J:-69:DA:H5'	1.96	0.47
4:N:65:PHE:O	4:N:69:ILE:HG12	2.14	0.47
2:B:80:THR:OG1	6:J:28:DG:OP1	2.30	0.47
1:A:40:ARG:HH22	5:I:-8:DG:H21	1.63	0.46
3:M:87:ILE:HD12	3:M:93:LEU:HD23	1.96	0.46
1:O:74:ILE:HG23	2:P:63:GLU:HG3	1.97	0.46
1:O:40:ARG:NH1	1:O:41:TYR:O	2.49	0.46
1:K:88:ALA:HB2	2:L:83:ALA:HA	1.96	0.46
2:F:84:MET:HG2	2:F:88:TYR:HE2	1.80	0.46
4:D:95:GLN:HA	4:D:98:VAL:HG12	1.97	0.46
1:E:133:GLU:N	1:E:133:GLU:OE1	2.49	0.46
5:I:28:DA:C8	5:I:28:DA:H5'	2.51	0.46
1:O:120:MET:HE3	1:O:121:PRO:HD2	1.96	0.46
6:J:13:DT:H1'	6:J:14:DT:C2	2.51	0.46
6:J:35:DC:H2''	6:J:36:DC:C5	2.50	0.46
6:T:-69:DA:C8	6:T:-69:DA:H5'	2.51	0.46
2:P:52:GLU:HG2	2:P:53:GLU:N	2.31	0.46
5:S:-35:DG:H2''	5:S:-34:DA:C8	2.51	0.46
1:A:83:ARG:NH2	6:J:27:DG:O3'	2.49	0.46
5:I:43:DA:H2'	5:I:44:DT:H71	1.98	0.46
6:J:43:DT:H2''	6:J:44:DC:C6	2.51	0.46
4:N:102:LEU:HB2	4:N:107:ALA:HB2	1.98	0.46
6:T:35:DC:H1'	6:T:36:DC:C2	2.51	0.46
1:A:113:HIS:CG	1:E:126:LEU:HD22	2.51	0.46
3:G:79:ILE:HG22	3:G:82:HIS:ND1	2.28	0.46
5:I:-19:DG:H2'	5:I:-18:DG:C8	2.51	0.46
5:S:31:DT:H2'	5:S:32:DG:C8	2.51	0.46
6:T:-37:DG:H2''	6:T:-36:DT:C5	2.50	0.45
5:I:-13:DA:H2''	5:I:-12:DA:C8	2.51	0.45
6:J:24:DA:H2''	6:J:25:DG:N7	2.31	0.45
6:T:-57:DC:H2''	6:T:-56:DC:C5	2.51	0.45
5:I:10:DG:H2'	5:I:11:DC:C6	2.51	0.45
1:O:90:MET:O	1:O:93:GLN:HG3	2.16	0.45
5:I:26:DA:H2''	5:I:27:DG:C8	2.52	0.45
6:J:-46:DC:H2''	6:J:-45:DA:C8	2.52	0.45
5:S:-4:DG:H1'	5:S:-3:DA:C5	2.51	0.45
3:C:63:LEU:HD23	3:C:63:LEU:HA	1.84	0.45
4:D:85:LYS:O	4:D:85:LYS:HD3	2.16	0.45
1:E:79:LYS:HD2	1:E:79:LYS:HA	1.83	0.45
6:J:-63:DC:C2	6:J:-62:DC:C5	3.05	0.45
6:J:-55:DG:H2''	6:J:-54:DA:C8	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:-17:DT:H6	6:J:-17:DT:H2'	1.59	0.45
5:I:-15:DA:H2''	5:I:-14:DA:N7	2.31	0.45
6:J:27:DG:H2''	6:J:28:DG:H8	1.82	0.45
5:I:26:DA:H2''	5:I:27:DG:N7	2.32	0.45
2:P:72:TYR:OH	2:P:92:ARG:NE	2.50	0.45
6:T:-39:DT:H5'	6:T:-39:DT:C6	2.51	0.45
4:R:90:THR:OG1	4:R:93:GLU:OE1	2.30	0.44
6:T:-19:DG:H2''	6:T:-18:DC:H5'	1.99	0.44
6:T:50:DA:H2'	6:T:51:DC:C6	2.51	0.44
5:I:-21:DG:H2'	5:I:-20:DC:H6	1.82	0.44
6:J:29:DA:H2'	6:J:30:DT:H71	1.99	0.44
2:P:57:VAL:O	2:P:60:VAL:HG12	2.17	0.44
3:G:32:ARG:HD3	3:G:35:ARG:HH12	1.82	0.44
3:G:91:GLU:HG2	3:G:92:GLU:N	2.32	0.44
5:I:-24:DT:H6	5:I:-24:DT:H2'	1.66	0.44
5:S:-6:DG:H2''	5:S:-5:DG:C8	2.53	0.44
6:T:28:DG:C2	6:T:29:DA:C5	3.05	0.44
5:I:35:DT:H2''	5:I:36:DA:N7	2.33	0.44
4:N:105:GLU:O	4:N:109:HIS:ND1	2.39	0.44
3:Q:73:ASN:O	3:Q:74:LYS:HG2	2.17	0.44
5:S:26:DA:H2''	5:S:27:DG:C8	2.53	0.44
4:D:67:ASN:O	4:D:70:PHE:N	2.50	0.44
4:H:86:ARG:HH21	4:H:88:THR:HB	1.83	0.44
5:I:58:DC:H2''	5:I:59:DA:N7	2.32	0.44
6:J:55:DT:O2	1:O:39:HIS:N	2.51	0.44
6:T:-46:DC:H2''	6:T:-45:DA:C8	2.53	0.44
1:E:102:GLY:O	1:E:105:GLU:HG3	2.18	0.44
6:T:-38:DC:H2''	6:T:-37:DG:C5	2.53	0.44
6:T:-17:DT:H6	6:T:-17:DT:H2'	1.63	0.44
3:G:23:LEU:HD23	3:G:23:LEU:HA	1.91	0.44
5:S:-23:DT:H2''	5:S:-22:DG:C8	2.52	0.44
5:S:6:DA:H2''	5:S:7:DC:C5	2.52	0.44
6:J:46:DA:H2''	6:J:47:DG:C8	2.52	0.43
3:M:75:LYS:HD3	3:M:75:LYS:HA	1.78	0.43
6:T:-39:DT:H5'	6:T:-39:DT:H6	1.83	0.43
2:B:29:ILE:O	2:B:55:ARG:NH2	2.47	0.43
2:F:63:GLU:HA	2:F:66:ILE:HG22	1.99	0.43
5:I:-14:DA:H2''	5:I:-13:DA:N7	2.33	0.43
6:J:-38:DC:H2''	6:J:-37:DG:N7	2.32	0.43
4:D:86:ARG:NH1	5:I:-34:DA:H5''	2.33	0.43
4:R:80:LEU:HD11	4:R:100:LEU:HD12	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:T:44:DC:H2''	6:T:45:DC:C5	2.54	0.43
1:E:62:ILE:HD12	1:E:97:GLU:OE2	2.17	0.43
5:I:6:DA:H2''	5:I:7:DC:C5	2.54	0.43
5:I:56:DG:H2''	5:I:57:DG:N7	2.34	0.43
6:J:-47:DT:H2''	6:J:-46:DC:C5	2.53	0.43
6:T:-17:DT:H5'	6:T:-17:DT:C6	2.53	0.43
6:J:-56:DC:H2''	6:J:-55:DG:C8	2.54	0.43
4:D:96:THR:O	4:D:100:LEU:HD23	2.19	0.43
1:E:82:LEU:H	1:E:82:LEU:HD23	1.83	0.43
6:J:-2:DC:C2	6:J:-1:DG:N7	2.87	0.43
3:M:97:LEU:HD22	3:M:100:VAL:HG21	2.01	0.43
4:N:69:ILE:HG23	4:N:72:ARG:HH21	1.84	0.43
1:K:113:HIS:O	1:K:115:LYS:NZ	2.52	0.42
6:T:-47:DT:H2''	6:T:-46:DC:C4	2.54	0.42
6:T:-3:DG:C4	6:T:-2:DC:C5	3.07	0.42
6:J:28:DG:C2	6:J:29:DA:C5	3.07	0.42
3:C:75:LYS:NZ	3:C:78:ILE:HA	2.35	0.42
4:D:58:ALA:HA	4:D:61:ILE:HG22	2.01	0.42
2:B:71:THR:O	2:B:74:GLU:HG3	2.19	0.42
1:E:74:ILE:HD12	2:F:62:LEU:HD11	2.00	0.42
5:I:45:DT:H2''	5:I:46:DG:C8	2.54	0.42
6:J:-22:DA:C4	6:J:-21:DC:C5	3.08	0.42
6:T:25:DG:H2''	6:T:26:DG:N7	2.33	0.42
3:C:65:LEU:HA	3:C:68:ASN:ND2	2.33	0.42
4:D:41:VAL:HA	4:D:44:VAL:HG12	2.00	0.42
1:E:48:LEU:HA	1:E:51:ILE:HG12	2.01	0.42
5:I:-44:DG:H2''	5:I:-43:DA:N7	2.34	0.42
1:A:102:GLY:O	1:A:105:GLU:HG3	2.20	0.42
2:F:35:ARG:NH1	5:I:8:DG:OP2	2.51	0.42
5:I:46:DG:H2''	5:I:47:DA:N7	2.34	0.42
6:J:-69:DA:H2''	6:J:-68:DG:N7	2.34	0.42
6:J:-21:DC:C2	6:J:-20:DC:C5	3.07	0.42
6:J:14:DT:H2''	6:J:15:DT:C5	2.55	0.42
1:O:47:ALA:O	1:O:50:GLU:HG3	2.19	0.42
2:B:39:ARG:HH12	2:B:44:LYS:HA	1.85	0.42
2:P:33:ALA:O	2:P:36:ARG:HG2	2.19	0.42
5:S:-45:DG:H2''	5:S:-44:DG:N7	2.35	0.42
5:S:35:DT:H2''	5:S:36:DA:N7	2.34	0.42
6:T:-12:DC:C2	6:T:-11:DG:N7	2.88	0.42
4:H:36:SER:OG	4:H:37:TYR:N	2.53	0.42
6:J:-68:DG:H2''	6:J:-67:DA:N7	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:-36:DT:H2''	6:J:-35:DA:C8	2.55	0.42
5:S:-46:DT:H2''	5:S:-45:DG:C8	2.54	0.42
3:C:50:TYR:CE1	4:D:114:GLY:HA3	2.55	0.42
2:F:84:MET:HG2	2:F:88:TYR:CE2	2.54	0.42
6:J:-13:DA:C4	6:J:-12:DC:C5	3.08	0.42
1:O:116:ARG:HG2	1:O:118:THR:H	1.85	0.42
5:S:15:DT:H2''	5:S:16:DA:C5	2.55	0.42
3:G:84:GLN:HG2	3:G:102:ILE:HD13	2.01	0.41
6:J:-12:DC:C2	6:J:-11:DG:C8	3.08	0.41
1:K:72:ARG:NH2	5:S:-23:DT:OP1	2.48	0.41
1:O:121:PRO:O	1:O:124:ILE:N	2.53	0.41
6:T:-13:DA:C4	6:T:-12:DC:C5	3.08	0.41
6:T:13:DT:H2''	6:T:14:DT:C4	2.55	0.41
4:H:72:ARG:NH1	4:H:101:LEU:HD22	2.35	0.41
3:M:90:ASP:N	3:M:90:ASP:OD1	2.47	0.41
1:O:61:LEU:HD22	2:P:36:ARG:HE	1.84	0.41
5:S:30:DC:H2'	5:S:31:DT:C6	2.55	0.41
6:T:-8:DC:H2''	6:T:-7:DG:N7	2.34	0.41
6:J:-33:DA:C4	6:J:-32:DC:C5	3.07	0.41
2:L:55:ARG:O	2:L:59:LYS:HG2	2.20	0.41
3:C:61:GLU:O	3:C:64:GLU:HG3	2.20	0.41
3:G:70:ALA:HA	3:G:82:HIS:CD2	2.55	0.41
5:I:4:DG:C2	6:J:-3:DG:C2	3.09	0.41
5:S:-17:DT:H2'	5:S:-16:DT:H71	2.02	0.41
2:B:33:ALA:HA	2:B:36:ARG:HE	1.84	0.41
5:I:32:DG:H2'	5:I:33:DT:H71	2.02	0.41
2:B:84:MET:HA	2:B:87:VAL:HG12	2.02	0.41
1:E:126:LEU:HA	1:E:129:ARG:HG2	2.03	0.41
2:P:77:LYS:HG3	4:R:92:ARG:HH12	1.86	0.41
6:T:-45:DA:H2''	6:T:-44:DA:H8	1.84	0.41
2:B:72:TYR:HE2	4:D:100:LEU:HG	1.86	0.41
4:D:38:SER:OG	4:D:39:ILE:N	2.51	0.41
5:S:-13:DA:H2''	5:S:-12:DA:C8	2.56	0.41
5:S:53:DC:C6	5:S:54:DT:H72	2.55	0.41
6:T:-57:DC:H2''	6:T:-56:DC:C4	2.55	0.41
6:T:-47:DT:H6	6:T:-47:DT:H2'	1.72	0.41
5:I:-6:DG:H2''	5:I:-5:DG:C8	2.56	0.41
1:K:40:ARG:NH2	5:S:-8:DG:H21	2.18	0.41
4:R:108:LYS:HA	4:R:111:VAL:HG22	2.03	0.41
6:T:-38:DC:H6	6:T:-38:DC:H2'	1.72	0.41
6:T:-10:DC:C2	6:T:-9:DA:N7	2.89	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:70:ALA:HA	3:C:75:LYS:HG2	2.02	0.41
4:D:69:ILE:O	4:D:73:ILE:HG12	2.21	0.41
5:I:-27:DC:H2''	5:I:-26:DC:C5	2.56	0.41
5:I:-11:DC:H6	5:I:-11:DC:H2'	1.77	0.41
5:I:18:DG:H2''	5:I:19:DC:C5	2.56	0.41
6:J:-61:DG:H2''	6:J:-60:DG:H8	1.86	0.41
3:Q:63:LEU:HD22	4:R:45:LEU:HD13	2.03	0.41
5:S:-44:DG:H2''	5:S:-43:DA:N7	2.36	0.41
3:C:75:LYS:O	3:C:77:ARG:N	2.53	0.41
5:I:27:DG:H1'	5:I:28:DA:C5	2.56	0.41
2:B:31:LYS:HA	2:B:34:ILE:HD12	2.03	0.40
3:C:42:ARG:HB2	4:D:88:THR:HA	2.03	0.40
6:T:11:DG:O5'	6:T:11:DG:H8	2.04	0.40
1:A:121:PRO:HA	1:A:124:ILE:HD13	2.03	0.40
4:D:67:ASN:O	4:D:71:GLU:OE1	2.38	0.40
4:N:98:VAL:HG13	4:N:102:LEU:HD12	2.04	0.40
6:T:-59:DT:H6	6:T:-59:DT:H2'	1.76	0.40
6:T:-56:DC:H2''	6:T:-55:DG:C8	2.56	0.40
6:T:38:DT:C2	6:T:39:DA:N7	2.90	0.40
4:D:96:THR:HA	4:D:99:ARG:HG2	2.02	0.40
6:J:-1:DG:C4	6:J:0:DC:C5	3.10	0.40
6:J:30:DT:H2'	6:J:31:DT:H71	2.03	0.40
5:S:27:DG:H2''	5:S:28:DA:N7	2.36	0.40
6:T:-28:DT:H2''	6:T:-27:DC:C5	2.56	0.40
3:C:50:TYR:CD1	4:D:114:GLY:HA3	2.56	0.40
1:E:119:ILE:HD11	2:F:46:ILE:HG23	2.03	0.40
5:I:47:DA:H2''	5:I:48:DG:C8	2.56	0.40
6:J:9:DG:C4	6:J:10:DC:C5	3.09	0.40
3:M:40:SER:OG	4:N:87:SER:O	2.39	0.40
6:T:-61:DG:C2	6:T:-60:DG:C5	3.10	0.40
6:T:-58:DG:H2''	6:T:-57:DC:C5	2.56	0.40
2:F:90:LEU:HA	2:F:90:LEU:HD12	1.86	0.40
6:J:-4:DC:H2''	6:J:-3:DG:H8	1.87	0.40
6:J:55:DT:H1'	1:O:39:HIS:HA	2.04	0.40
3:M:58:LEU:O	3:M:62:ILE:HG12	2.20	0.40
6:T:27:DG:C2	6:T:28:DG:C5	3.10	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	93/135 (69%)	90 (97%)	3 (3%)	0	100	100
1	E	93/135 (69%)	87 (94%)	6 (6%)	0	100	100
1	K	94/135 (70%)	91 (97%)	3 (3%)	0	100	100
1	O	93/135 (69%)	91 (98%)	2 (2%)	0	100	100
2	B	75/102 (74%)	72 (96%)	3 (4%)	0	100	100
2	F	75/102 (74%)	75 (100%)	0	0	100	100
2	L	63/102 (62%)	63 (100%)	0	0	100	100
2	P	69/102 (68%)	69 (100%)	0	0	100	100
3	C	81/129 (63%)	79 (98%)	2 (2%)	0	100	100
3	G	89/129 (69%)	86 (97%)	3 (3%)	0	100	100
3	M	77/129 (60%)	73 (95%)	4 (5%)	0	100	100
3	Q	79/129 (61%)	76 (96%)	3 (4%)	0	100	100
4	D	84/125 (67%)	81 (96%)	3 (4%)	0	100	100
4	H	86/125 (69%)	86 (100%)	0	0	100	100
4	N	87/125 (70%)	84 (97%)	3 (3%)	0	100	100
4	R	81/125 (65%)	78 (96%)	3 (4%)	0	100	100
All	All	1319/1964 (67%)	1281 (97%)	38 (3%)	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	83/110 (76%)	83 (100%)	0	100	100
1	E	83/110 (76%)	83 (100%)	0	100	100
1	K	84/110 (76%)	84 (100%)	0	100	100
1	O	83/110 (76%)	83 (100%)	0	100	100
2	B	63/78 (81%)	63 (100%)	0	100	100
2	F	63/78 (81%)	63 (100%)	0	100	100
2	L	54/78 (69%)	54 (100%)	0	100	100
2	P	59/78 (76%)	59 (100%)	0	100	100
3	C	65/99 (66%)	65 (100%)	0	100	100
3	G	72/99 (73%)	72 (100%)	0	100	100
3	M	61/99 (62%)	61 (100%)	0	100	100
3	Q	63/99 (64%)	63 (100%)	0	100	100
4	D	73/105 (70%)	73 (100%)	0	100	100
4	H	75/105 (71%)	75 (100%)	0	100	100
4	N	76/105 (72%)	76 (100%)	0	100	100
4	R	70/105 (67%)	70 (100%)	0	100	100
All	All	1127/1568 (72%)	1127 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	93	GLN
3	C	38	ASN
3	C	73	ASN
4	D	67	ASN
1	E	76	GLN
1	E	85	GLN
2	F	27	GLN
3	G	24	GLN
4	H	67	ASN
4	N	63	ASN
1	O	39	HIS
3	Q	104	GLN
4	R	67	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

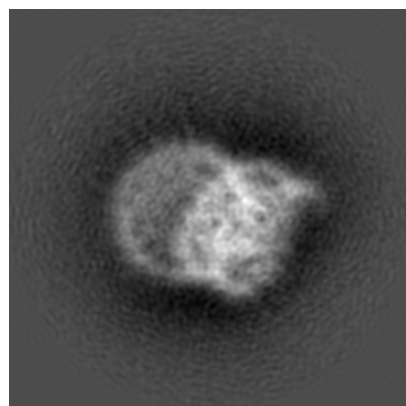
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-65691. These allow visual inspection of the internal detail of the map and identification of artifacts.

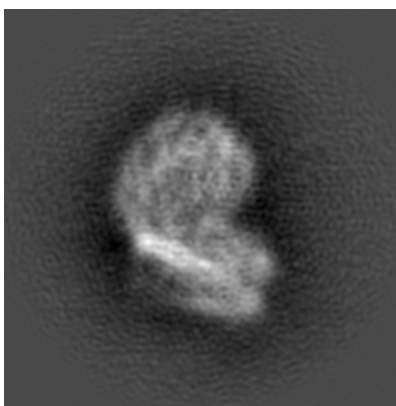
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



X

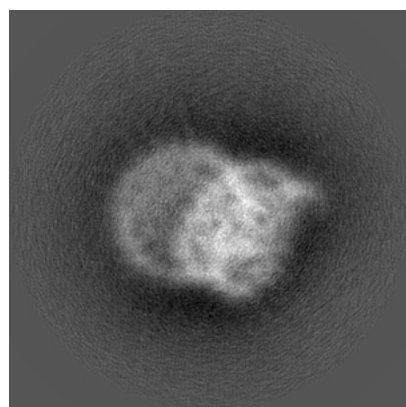


Y

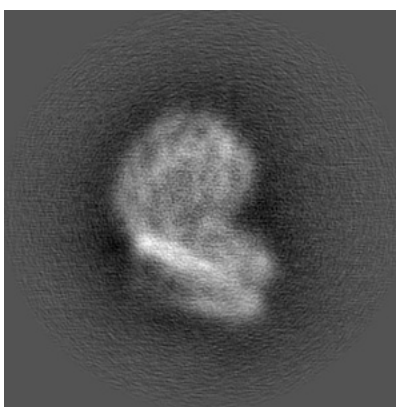


Z

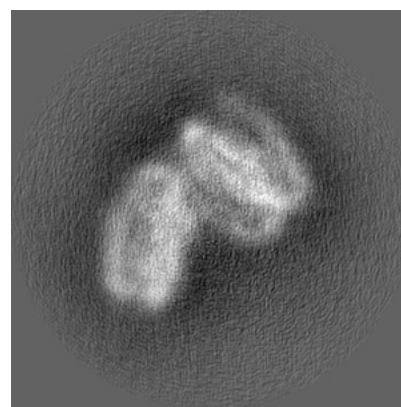
6.1.2 Raw map



X



Y

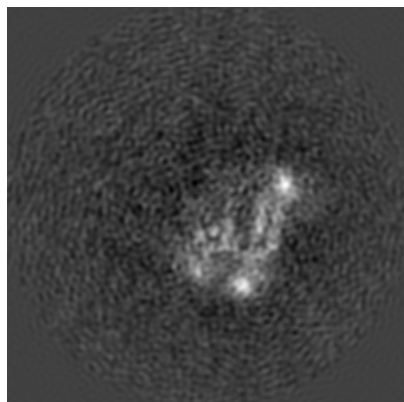


Z

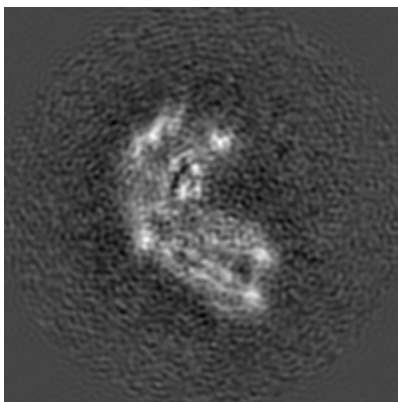
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

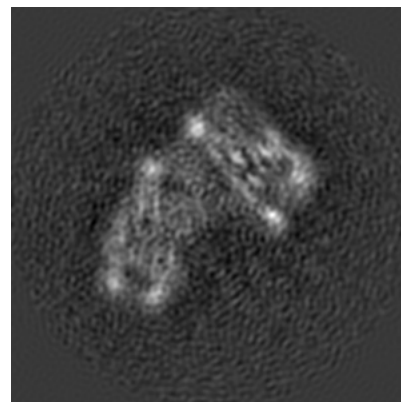
6.2.1 Primary map



X Index: 128

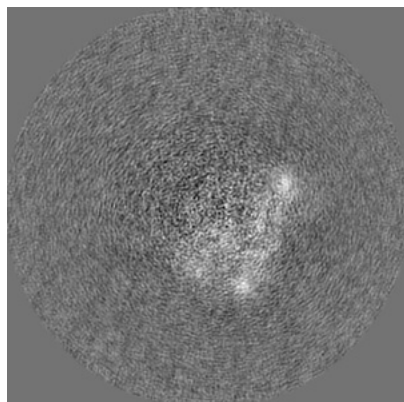


Y Index: 128

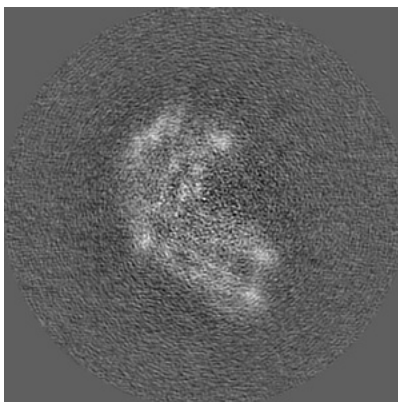


Z Index: 128

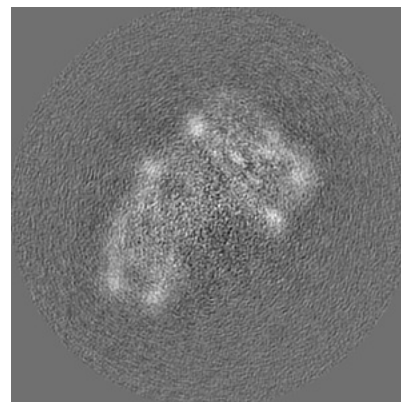
6.2.2 Raw map



X Index: 128



Y Index: 128

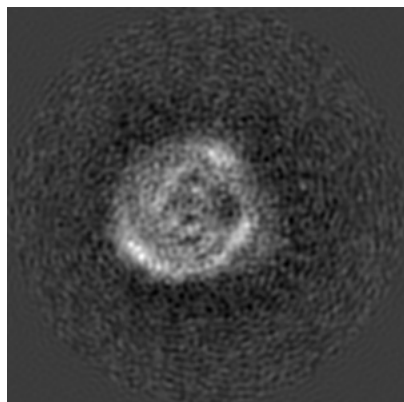


Z Index: 128

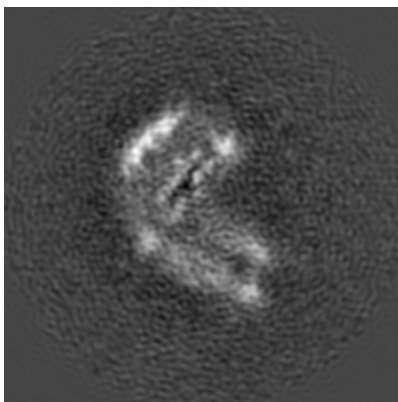
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

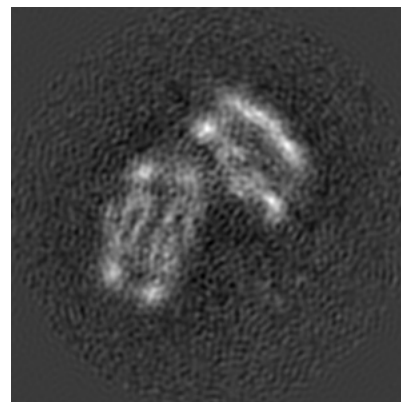
6.3.1 Primary map



X Index: 101

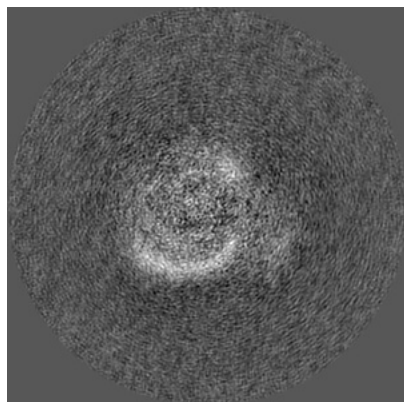


Y Index: 133

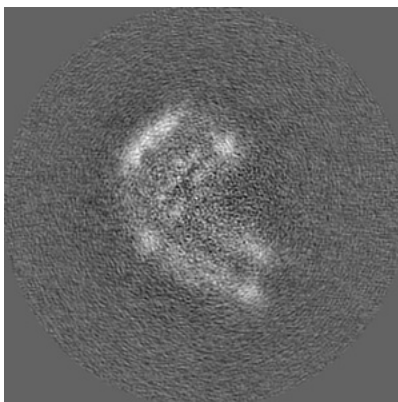


Z Index: 139

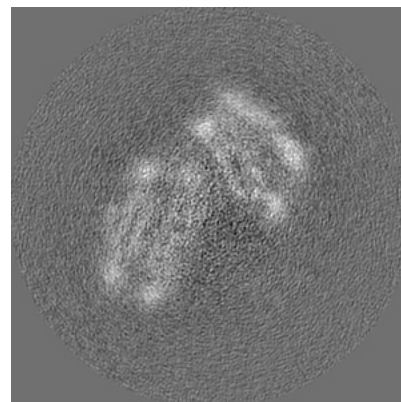
6.3.2 Raw map



X Index: 106



Y Index: 133

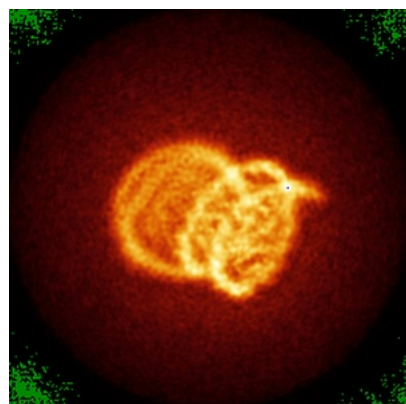


Z Index: 137

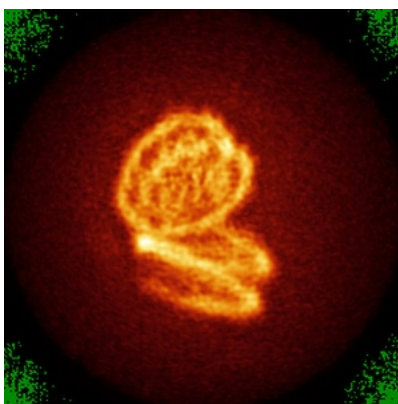
The images above show the largest variance slices of the map in three orthogonal directions.

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

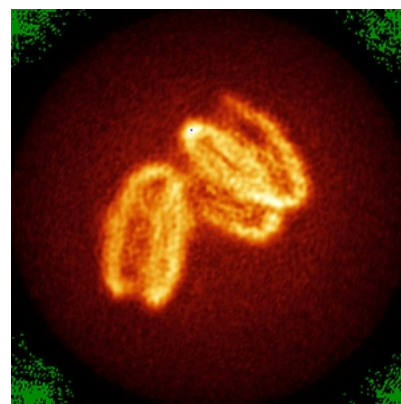
6.4.1 Primary map



X

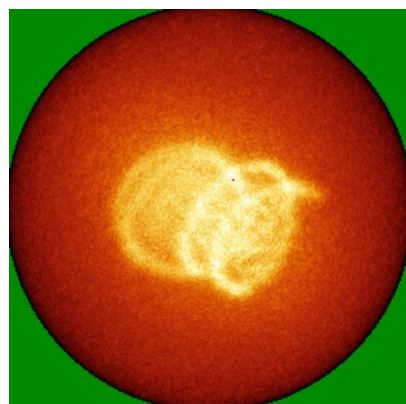


Y

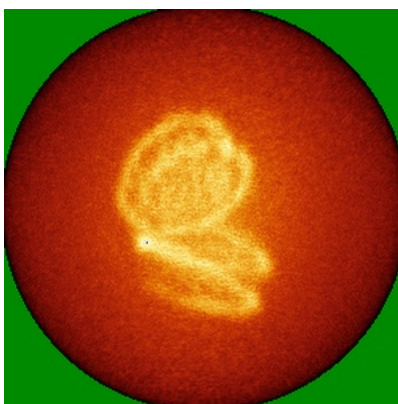


Z

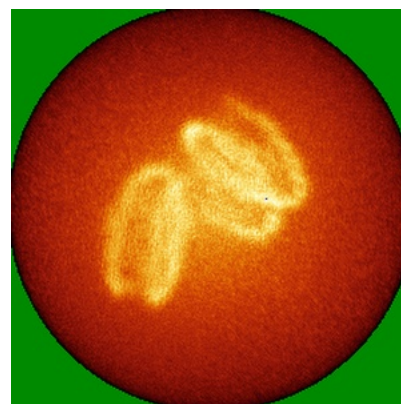
6.4.2 Raw map



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.

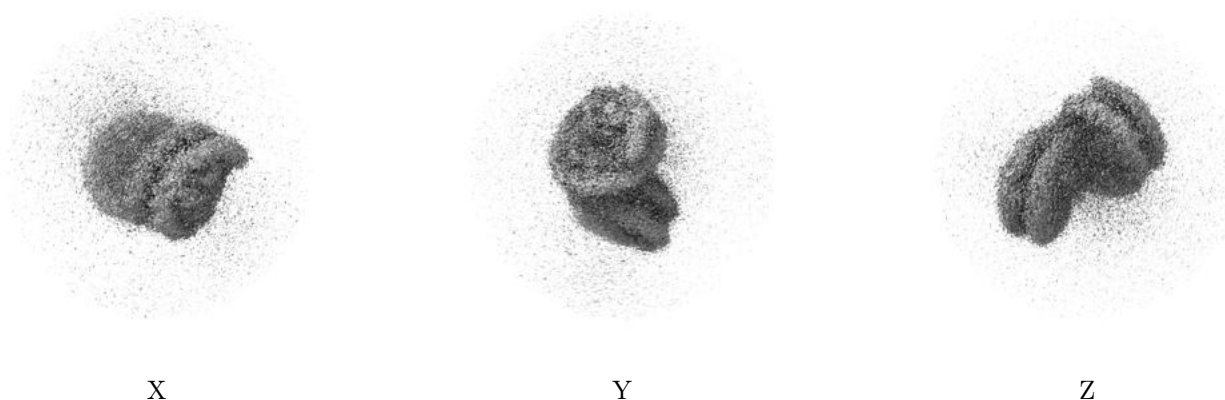
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.004. 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.

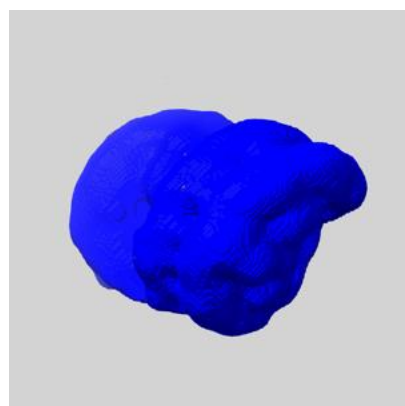
6.6 Mask visualisation [i](#)

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

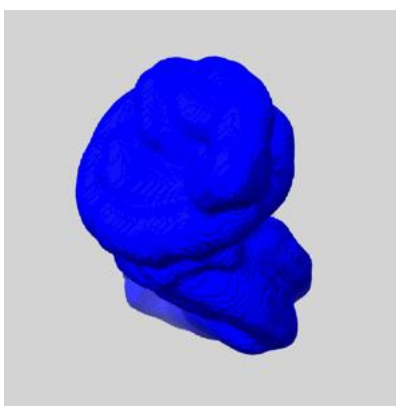
A mask typically either:

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

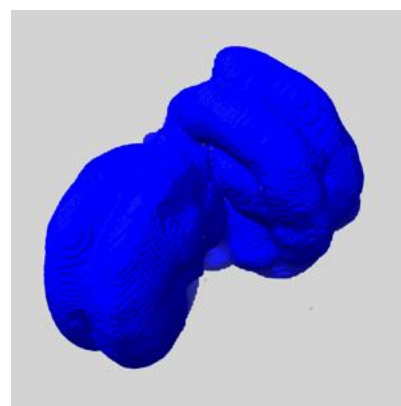
6.6.1 emd_65691_msk_1.map [i](#)



X



Y

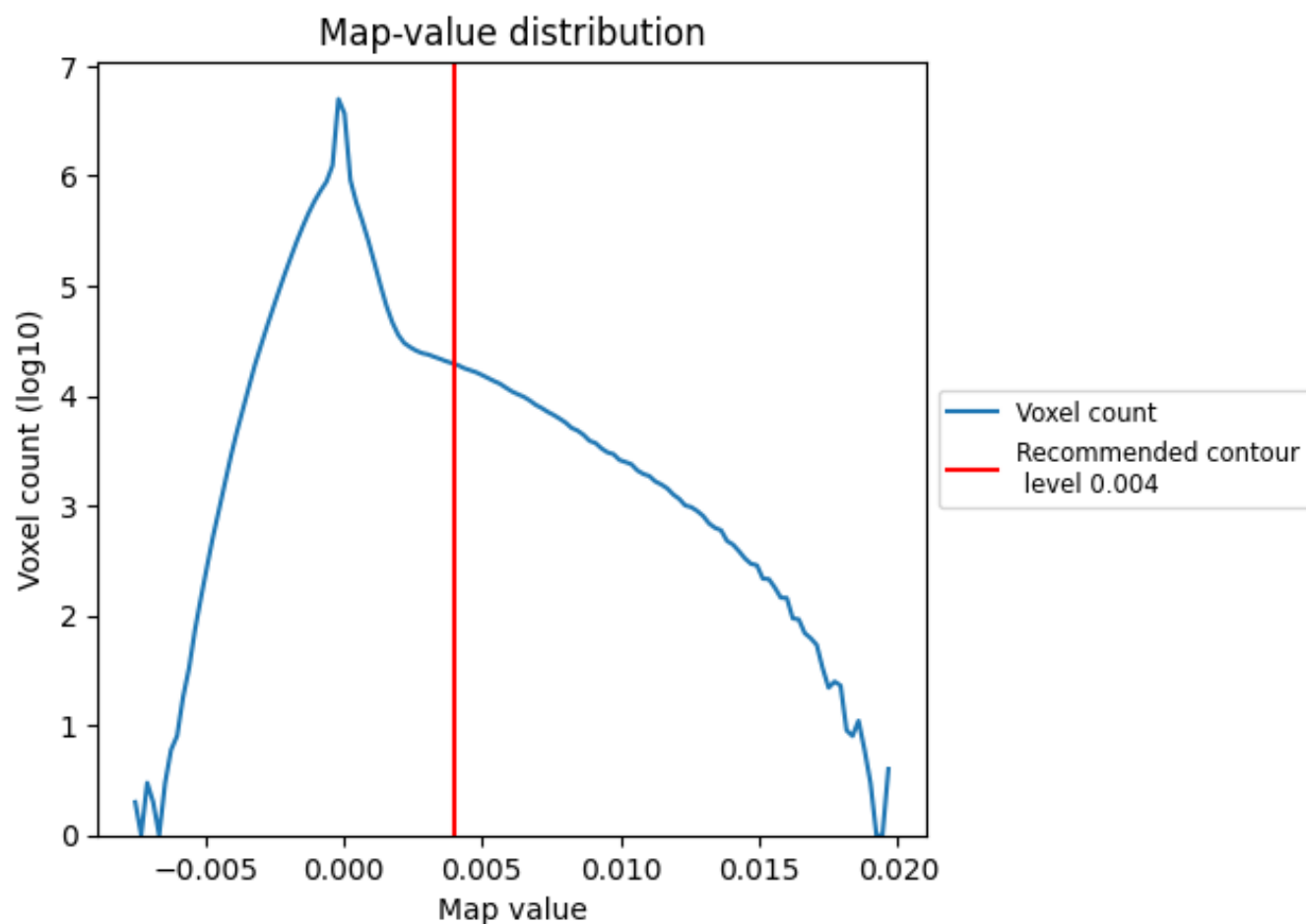


Z

7 Map analysis [i](#)

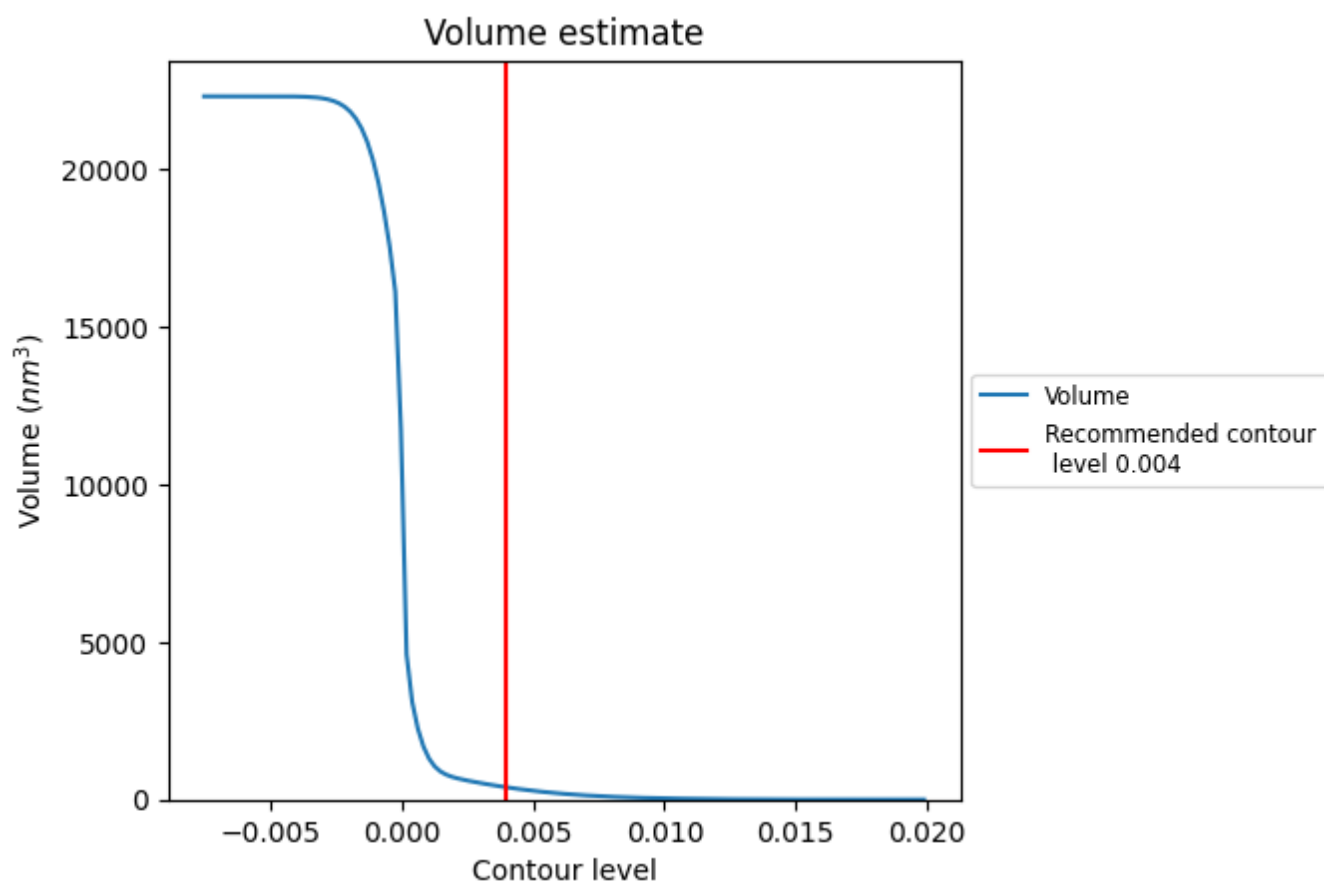
This section contains the results of statistical analysis of the map.

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.

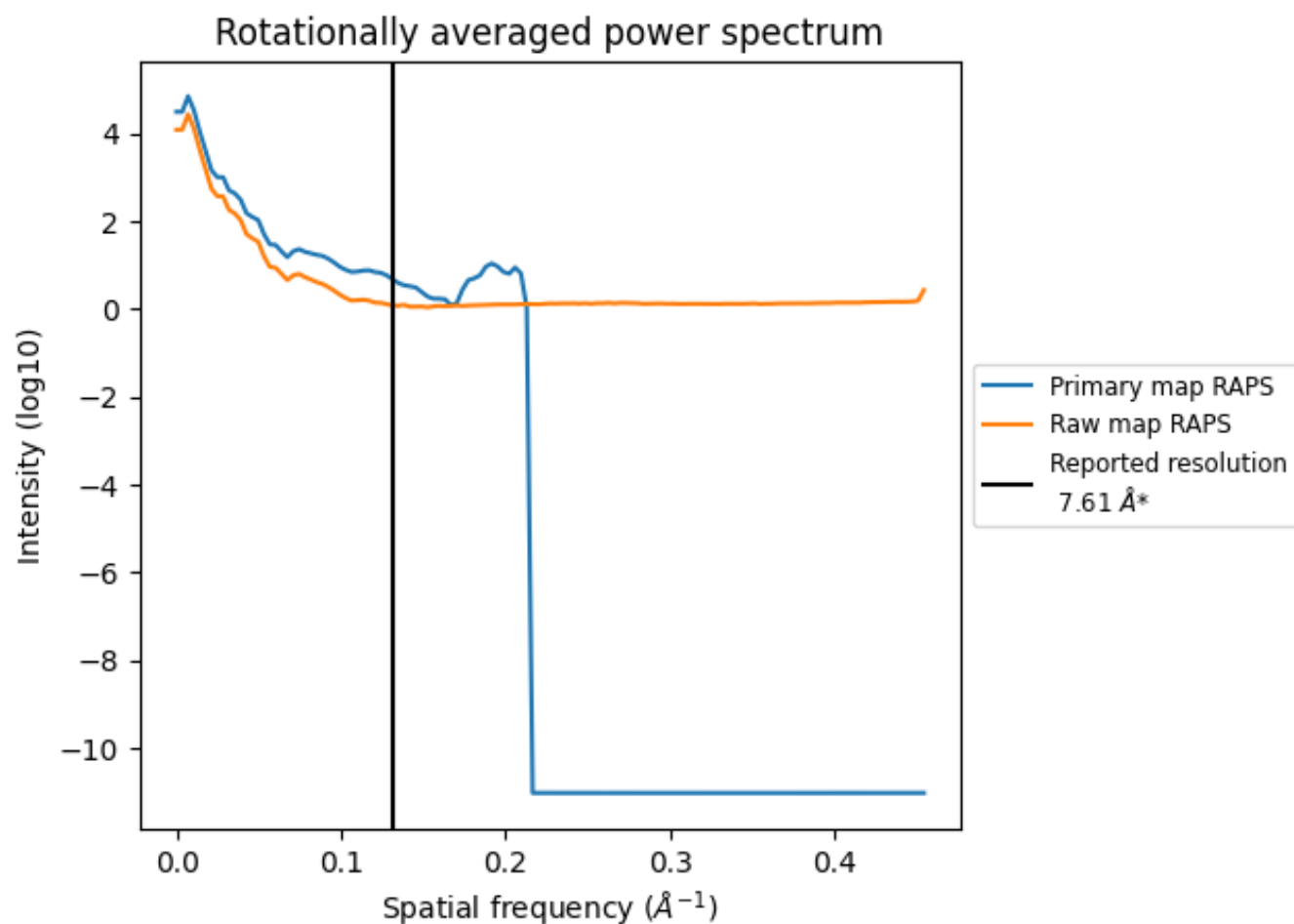
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 389 nm³; this corresponds to an approximate mass of 351 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 ⓘ

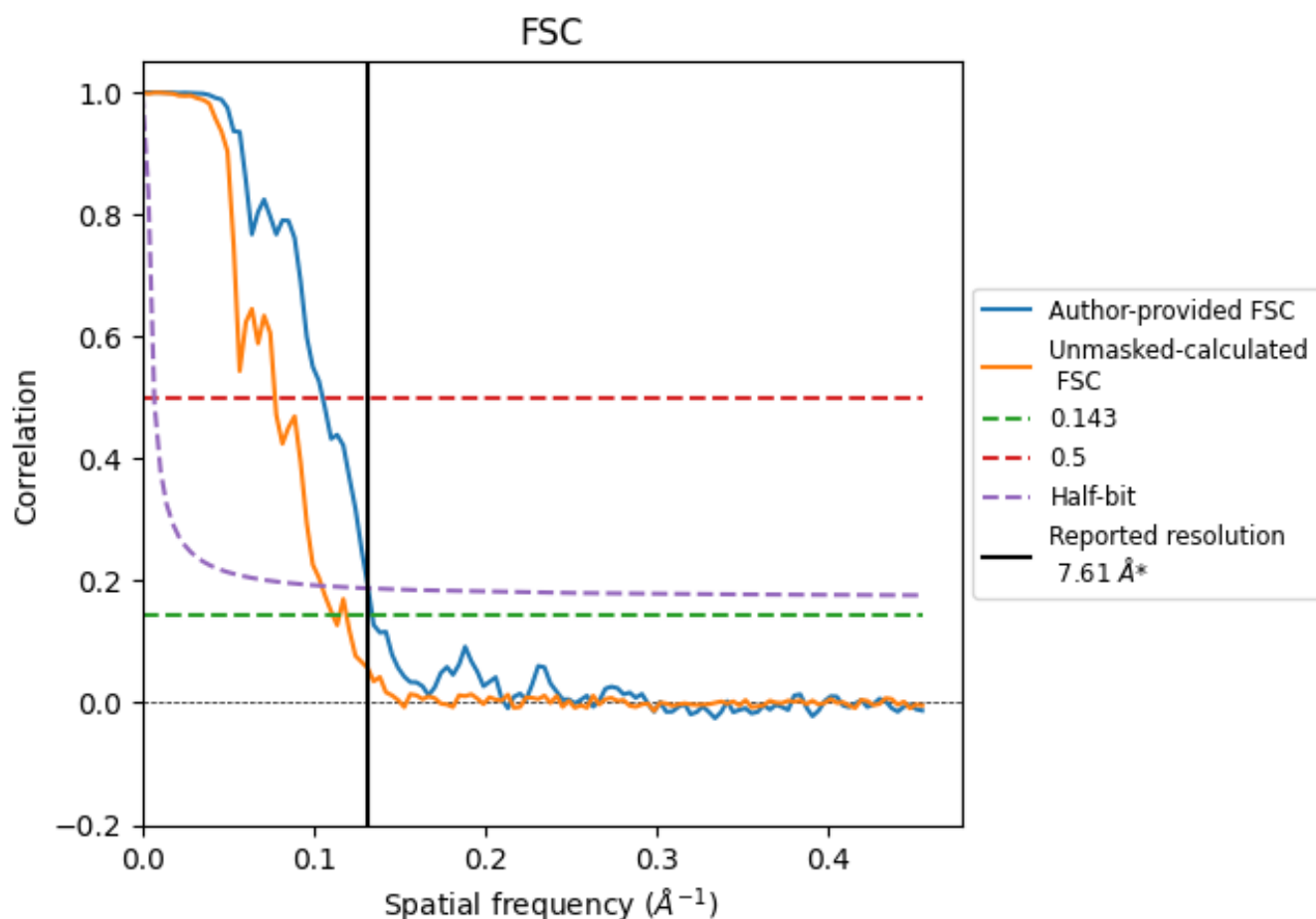


*Reported resolution corresponds to spatial frequency of 0.131 Å⁻¹

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 $0.131 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

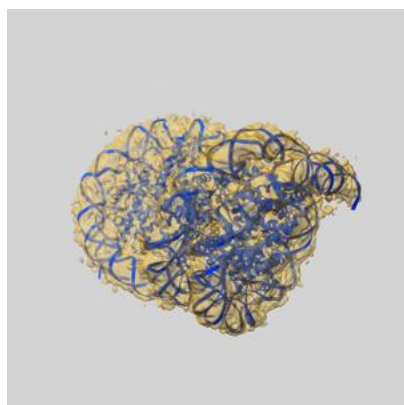
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	7.61	-	-
Author-provided FSC curve	7.46	9.51	7.59
Unmasked-calculated*	9.00	12.92	9.56

*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 9.00 differs from the reported value 7.61 by more than 10 %

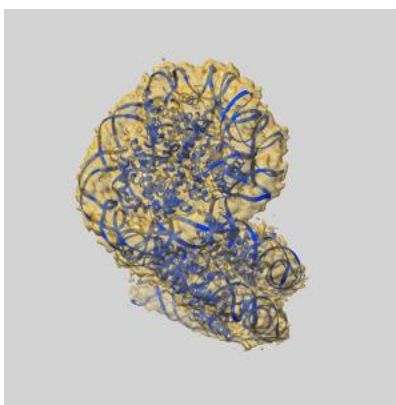
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-65691 and PDB model 9W6H. Per-residue inclusion information can be found in [section 3](#) on [page 6](#).

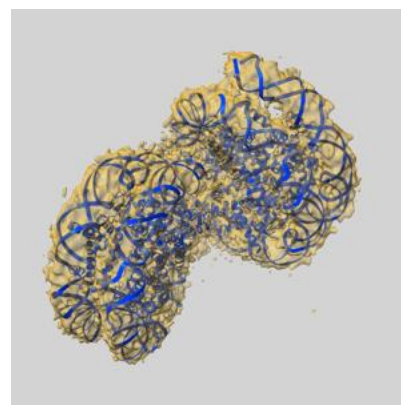
9.1 Map-model overlay [i](#)



X



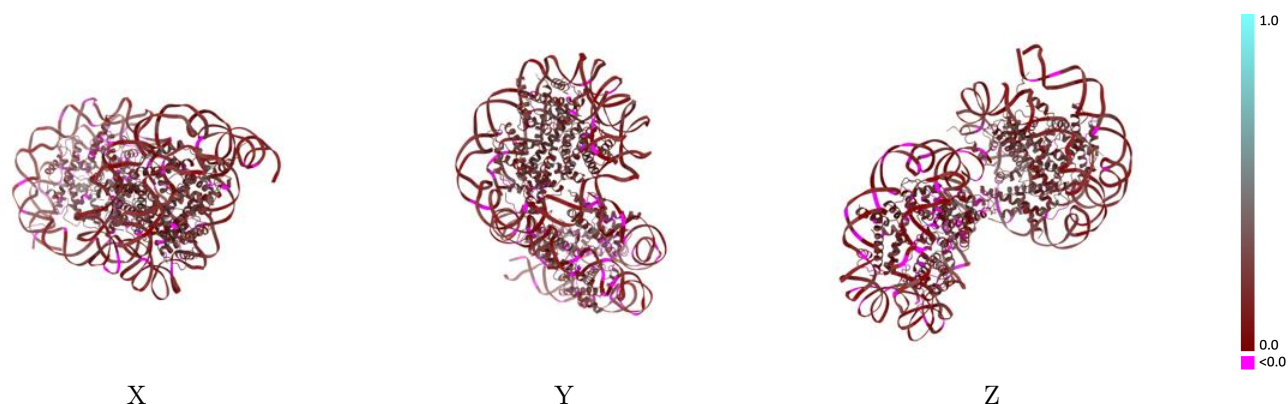
Y



Z

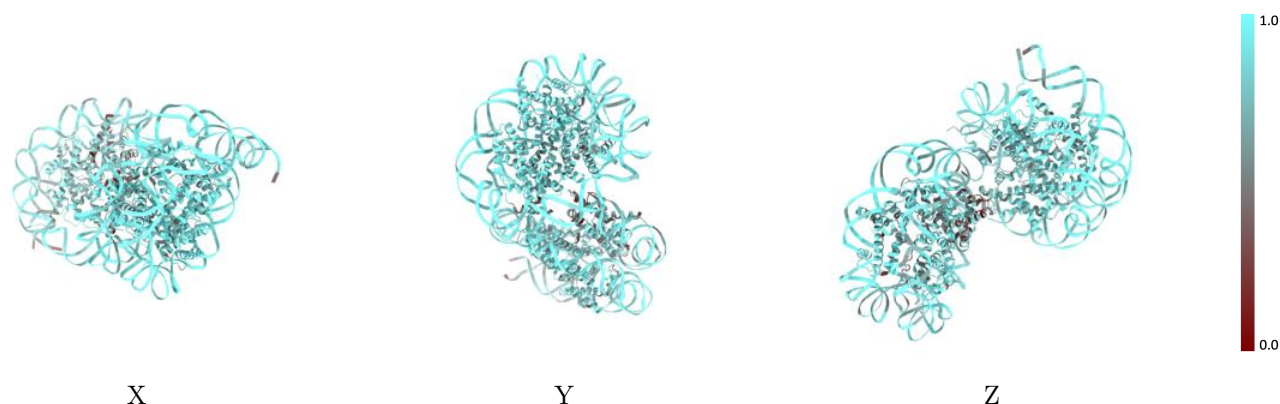
The images above show the 3D surface view of the map at the recommended contour level 0.004 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



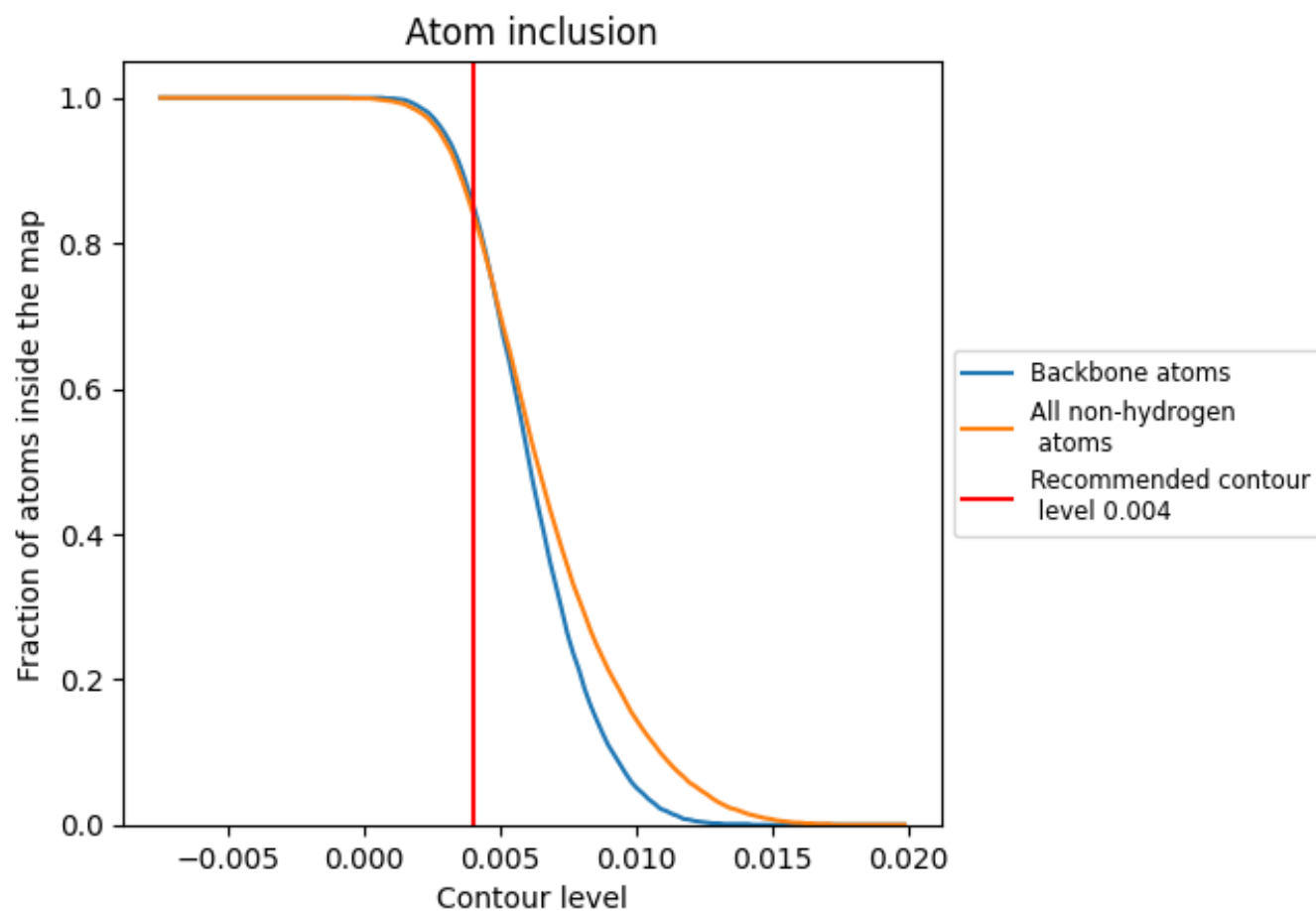
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.004).

9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 84% 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 (0.004) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8410	 0.1580
A	 0.8630	 0.2170
B	 0.8850	 0.2500
C	 0.8120	 0.2240
D	 0.8790	 0.2360
E	 0.8620	 0.2070
F	 0.8970	 0.2350
G	 0.8790	 0.2420
H	 0.8840	 0.2320
I	 0.9010	 0.1430
J	 0.8910	 0.1410
K	 0.8080	 0.1610
L	 0.8500	 0.1510
M	 0.6220	 0.1800
N	 0.6520	 0.1510
O	 0.7570	 0.1800
P	 0.8370	 0.1560
Q	 0.7640	 0.1660
R	 0.8170	 0.1610
S	 0.8470	 0.0950
T	 0.8220	 0.0940

