



Full wwPDB EM Validation Report ⓘ

Apr 1, 2026 – 12:39 PM JST

PDB ID : 9XTD / pdb_00009xtd
EMDB ID : EMD-67202
Title : E.coli delta lepA 30S ribosomal subunit class B, body domain
Authors : Kravchenko, O.V.; Maksimova, E.M.; Baymukhametov, T.N.; Stolboushkina, E.A.
Deposited on : 2025-11-22
Resolution : 2.26 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:

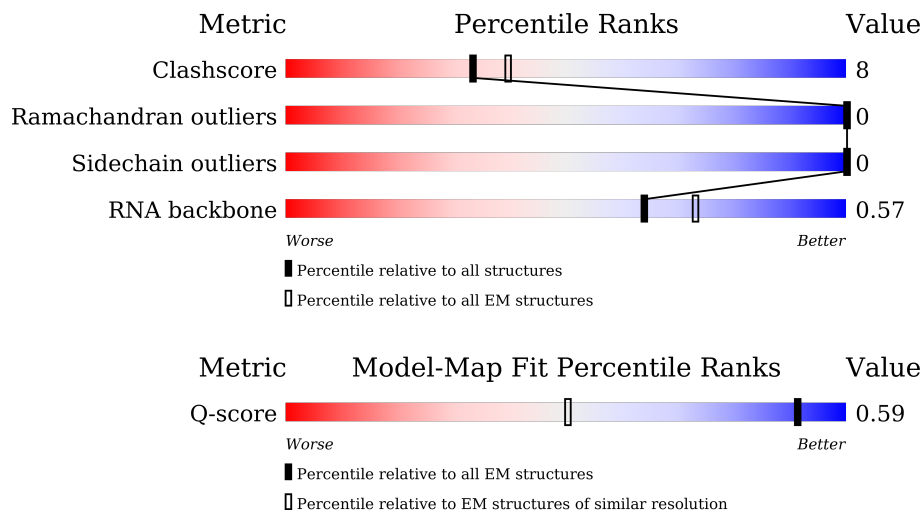
EMDB validation analysis : 0.0.1.dev132
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.48.1

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.26 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	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	3535 (1.76 - 2.76)

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	1542	
2	D	205	
3	E	157	

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Mol	Chain	Length	Quality of chain
4	F	106	<p>10% 71% 29%</p>
5	H	129	<p>88% 12%</p>
6	K	117	<p>53% 53% 47%</p>
7	L	123	<p>88% 11%</p>
8	O	88	<p>88% 13%</p>
9	P	82	<p>93% 7%</p>
10	Q	80	<p>81% 19%</p>
11	R	55	<p>93% 7%</p>
12	T	86	<p>91% 9%</p>
13	B	224	<p>39% 78% 22%</p>

2 Entry composition

There are 15 unique types of molecules in this entry. The entry contains 37507 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 RNA chain called RNA (1128-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	1128	24236	10809	4460	7839	1128	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	205	1643	1026	315	298	4	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	E	157	1156	719	218	213	6	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein bS6, non-modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	F	106	862	545	156	154	7	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	H	129	979	616	173	184	6	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	K	117	877	540	174	160	3	0	0

- Molecule 7 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	L	123	957	591	196	165	5	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	O	88	714	439	144	130	1	0	0

- Molecule 9 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	P	82	649	406	128	114	1	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	Q	80	648	411	121	113	3	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein bS18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	R	55	455	288	86	81	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	T	86	670	414	138	115	3	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	B	224	1753	1109	315	321	8	0	0

- Molecule 14 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of

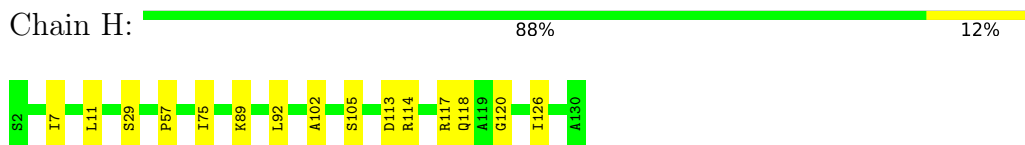
Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
14	A	39	Total 39	O Mg 39	0

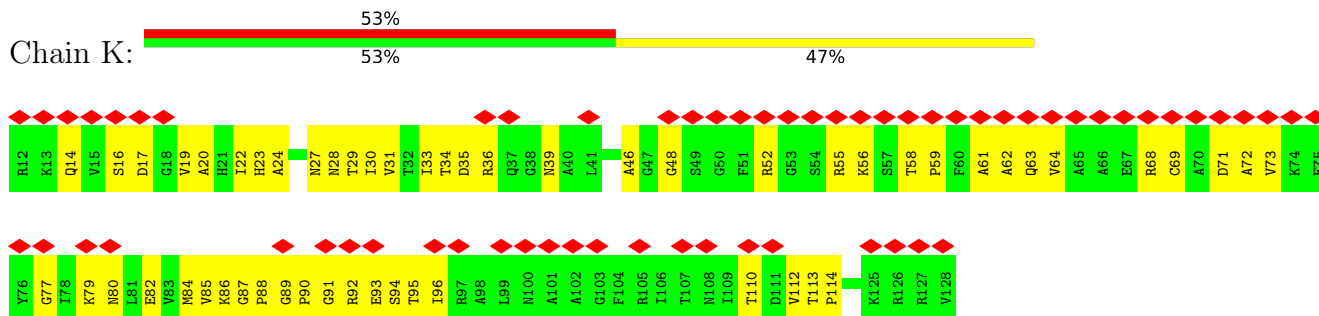
- Molecule 15 is water.

Mol	Chain	Residues	Atoms		AltConf
15	A	1677	Total 1677	O 1677	0
15	D	30	Total 30	O 30	0
15	E	5	Total 5	O 5	0
15	H	32	Total 32	O 32	0
15	L	35	Total 35	O 35	0
15	O	11	Total 11	O 11	0
15	P	41	Total 41	O 41	0
15	Q	12	Total 12	O 12	0
15	T	26	Total 26	O 26	0

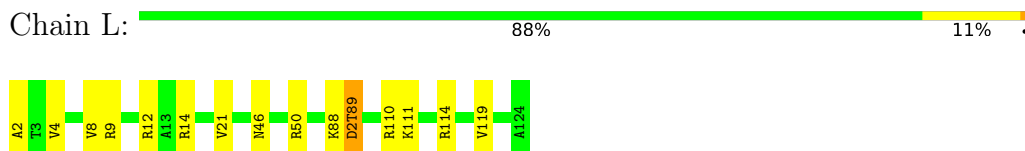
- Molecule 5: Small ribosomal subunit protein uS8



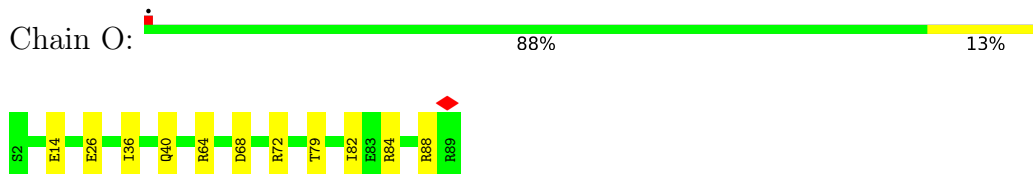
- Molecule 6: Small ribosomal subunit protein uS11



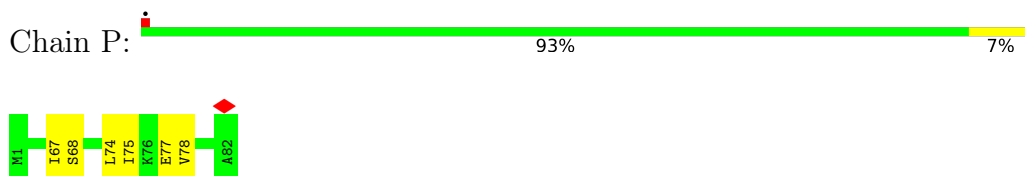
- Molecule 7: Small ribosomal subunit protein uS12



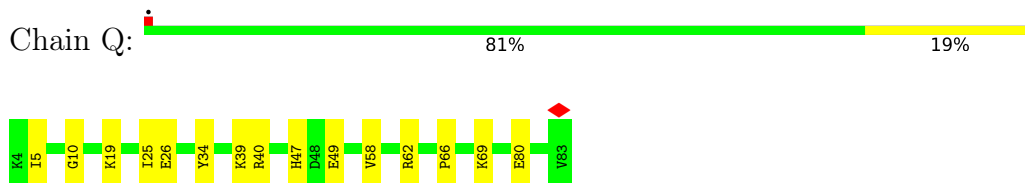
- Molecule 8: Small ribosomal subunit protein uS15



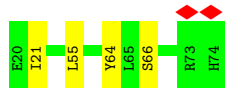
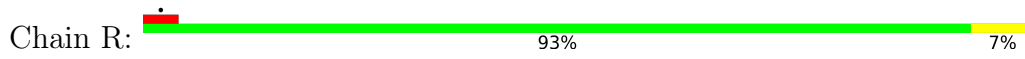
- Molecule 9: 30S ribosomal protein S16



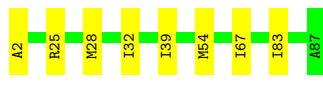
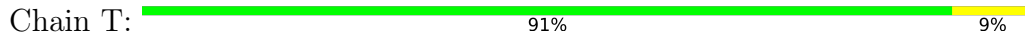
- Molecule 10: Small ribosomal subunit protein uS17



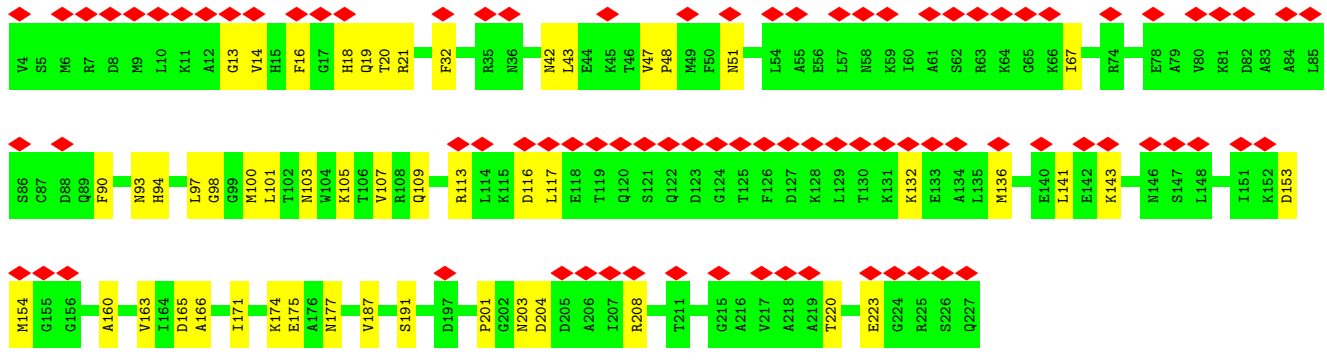
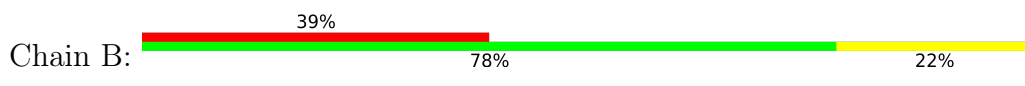
- Molecule 11: Small ribosomal subunit protein bS18



- Molecule 12: Small ribosomal subunit protein bs20



- Molecule 13: Small ribosomal subunit protein uS2



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	269839	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	72	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	5.673	Depositor
Minimum map value	-2.997	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.068	Depositor
Recommended contour level	0.13	Depositor
Map size (\AA)	379.72, 379.72, 379.72	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.863, 0.863, 0.863	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, G7M, 2MG, PSU, D2T, MA6

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	0.23	0/27007	0.32	0/42125
2	D	0.16	0/1665	0.30	0/2227
3	E	0.21	0/1169	0.34	0/1573
4	F	0.10	0/881	0.27	0/1189
5	H	0.34	0/989	0.51	0/1326
6	K	0.09	0/893	0.28	0/1205
7	L	0.31	0/960	0.49	0/1286
8	O	0.25	0/722	0.41	0/964
9	P	0.51	0/659	0.70	0/884
10	Q	0.24	0/657	0.45	0/881
11	R	0.11	0/462	0.25	0/621
12	T	0.30	0/676	0.43	0/895
13	B	0.10	0/1784	0.26	0/2403
All	All	0.23	0/38524	0.34	0/57579

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	24236	0	12200	309	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1643	0	1707	27	0
3	E	1156	0	1199	17	0
4	F	862	0	864	22	0
5	H	979	0	1031	10	0
6	K	877	0	887	40	0
7	L	957	0	1017	15	0
8	O	714	0	734	7	0
9	P	649	0	666	4	0
10	Q	648	0	691	10	0
11	R	455	0	478	3	0
12	T	670	0	719	5	0
13	B	1753	0	1780	36	0
14	A	39	0	0	0	0
15	A	1677	0	0	20	0
15	D	30	0	0	1	0
15	E	5	0	0	0	0
15	H	32	0	0	0	0
15	L	35	0	0	2	0
15	O	11	0	0	0	0
15	P	41	0	0	0	0
15	Q	12	0	0	0	0
15	T	26	0	0	1	0
All	All	37507	0	23973	463	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 8.

All (463) 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)
13:B:20:THR:HG22	13:B:21:ARG:H	1.12	1.09
1:A:79:G:H21	1:A:90:C:H41	1.19	0.89
4:F:6:ILE:HG13	4:F:89:VAL:HG23	1.56	0.87
1:A:664:G:H22	1:A:741:G:H1	1.22	0.86
13:B:20:THR:HG22	13:B:21:ARG:N	1.92	0.83
1:A:1479:C:H2'	1:A:1480:A:H8	1.47	0.80
6:K:112:VAL:HG12	6:K:112:VAL:O	1.85	0.77
1:A:1480:A:H2'	1:A:1481:U:C6	2.21	0.76
1:A:1071:C:H2'	1:A:1072:G:H8	1.51	0.74
13:B:16:PHE:HA	13:B:43:LEU:HD11	1.70	0.74
13:B:20:THR:CG2	13:B:21:ARG:H	1.95	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:B:163:VAL:HG12	13:B:165:ASP:H	1.55	0.71
6:K:62:ALA:HB1	6:K:95:THR:HB	1.73	0.71
8:O:14:GLU:OE1	8:O:84:ARG:NH2	2.24	0.71
1:A:880:C:OP1	7:L:9:ARG:NH1	2.23	0.70
3:E:11:LEU:HD22	3:E:71:MET:HE1	1.74	0.69
6:K:31:VAL:HG13	6:K:69:CYS:SG	2.33	0.68
1:A:673:A:H2'	1:A:674:G:C8	2.29	0.68
1:A:524:G:H2'	1:A:525:C:C6	2.29	0.67
4:F:64:VAL:HG12	4:F:65:GLU:N	2.08	0.67
1:A:1081:A:OP2	3:E:52:LYS:NZ	2.29	0.66
2:D:172:GLU:HB2	2:D:183:LYS:HD2	1.78	0.66
3:E:39:VAL:HG23	3:E:71:MET:HE3	1.78	0.65
1:A:677:U:H3	1:A:713:G:H22	1.42	0.65
1:A:925:G:HO2'	1:A:1393:U:H3	1.44	0.65
2:D:9:LEU:HD13	2:D:32:CYS:HB3	1.79	0.65
1:A:85:U:O2	1:A:86:G:N2	2.30	0.64
13:B:13:GLY:HA3	13:B:208:ARG:HE	1.62	0.64
1:A:1409:C:H2'	1:A:1410:A:C8	2.34	0.63
6:K:33:ILE:HD11	6:K:73:VAL:HG21	1.80	0.63
4:F:68:GLN:HA	4:F:71:ILE:HG12	1.79	0.63
4:F:18:VAL:HG23	4:F:19:PRO:HD3	1.80	0.62
1:A:429:U:H5'	2:D:9:LEU:HD12	1.81	0.62
6:K:87:GLY:H	6:K:113:THR:HG22	1.64	0.62
6:K:84:MET:SD	6:K:110:THR:OG1	2.56	0.62
10:Q:5:ILE:HD11	10:Q:62:ARG:HE	1.64	0.62
1:A:337:G:H2'	1:A:338:A:C8	2.35	0.62
1:A:17:U:H2'	1:A:18:C:C6	2.35	0.61
1:A:687:A:N6	1:A:701:U:O4'	2.33	0.61
1:A:713:G:H2'	1:A:714:G:C8	2.35	0.61
1:A:728:A:H2'	1:A:729:A:C8	2.36	0.61
4:F:10:VAL:HA	4:F:84:VAL:HA	1.83	0.61
1:A:680:C:H2'	1:A:681:A:H8	1.66	0.60
1:A:705:G:H21	6:K:30:ILE:HD11	1.65	0.60
6:K:55:ARG:NH1	6:K:58:THR:OG1	2.35	0.60
1:A:79:G:N2	1:A:90:C:H41	1.95	0.60
1:A:1393:U:H2'	1:A:1394:A:C8	2.37	0.60
3:E:115:LEU:HD13	3:E:123:VAL:HG11	1.83	0.60
1:A:405:U:O4	2:D:2:ALA:N	2.34	0.60
1:A:1478:U:O2'	1:A:1479:C:O4'	2.19	0.60
1:A:250:A:H4'	1:A:251:G:O5'	2.02	0.59
1:A:147:G:H2'	1:A:148:G:C8	2.37	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:841:C:H42	1:A:845:A:H62	1.50	0.59
13:B:93:ASN:OD1	13:B:94:HIS:ND1	2.24	0.59
1:A:613:C:H2'	1:A:614:C:C6	2.38	0.59
4:F:88:MET:HB2	11:R:64:TYR:HE2	1.67	0.59
1:A:437:U:O2'	2:D:120:HIS:ND1	2.29	0.59
1:A:1480:A:H2'	1:A:1481:U:H6	1.65	0.59
1:A:926:G:O5'	1:A:1392:G:N2	2.34	0.59
1:A:1071:C:H2'	1:A:1072:G:C8	2.36	0.58
13:B:166:ALA:HB3	13:B:191:SER:HB3	1.85	0.58
1:A:382:A:H2'	1:A:383:A:C8	2.39	0.58
2:D:54:GLN:HB3	2:D:203:LEU:HB2	1.86	0.58
1:A:1519:MA6:H8	1:A:1519:MA6:OP2	2.04	0.58
1:A:738:C:OP1	4:F:2:ARG:NH2	2.30	0.58
1:A:108:G:H5'	1:A:109:A:H5''	1.86	0.57
5:H:89:LYS:NZ	5:H:117:ARG:O	2.37	0.57
10:Q:47:HIS:HE2	10:Q:49:GLU:HG2	1.69	0.57
1:A:8:A:N6	2:D:206:LYS:HB3	2.20	0.57
1:A:555:U:H2'	1:A:556:C:C6	2.39	0.57
1:A:777:A:H2'	1:A:778:G:C8	2.39	0.57
1:A:501:C:OP1	7:L:114:ARG:NH2	2.36	0.57
1:A:925:G:O2'	1:A:1393:U:N3	2.35	0.57
6:K:22:ILE:HG13	6:K:85:VAL:HA	1.85	0.57
1:A:890:G:O2'	1:A:906:A:N6	2.37	0.57
1:A:79:G:O5'	1:A:79:G:H8	1.88	0.57
7:L:46:ASN:ND2	7:L:89:D2T:SB	2.77	0.57
1:A:427:U:OP2	1:A:428:G:O2'	2.20	0.57
6:K:29:THR:OG1	6:K:92:ARG:NH2	2.38	0.57
1:A:676:A:H5''	6:K:114:PRO:HB3	1.87	0.57
1:A:1488:G:H2'	1:A:1489:G:O4'	2.04	0.57
1:A:795:C:H4'	1:A:1505:G:H5'	1.87	0.56
4:F:64:VAL:CG1	4:F:65:GLU:N	2.68	0.56
1:A:266:G:H3'	10:Q:69:LYS:HB2	1.87	0.56
1:A:542:G:H5'	2:D:39:GLY:HA3	1.86	0.56
9:P:74:LEU:O	9:P:77:GLU:HG3	2.04	0.56
1:A:131:A:H2'	1:A:132:C:C6	2.41	0.56
1:A:309:A:O2'	1:A:607:A:N1	2.39	0.56
1:A:544:G:OP1	2:D:56:ARG:NH2	2.36	0.56
1:A:1491:G:N2	1:A:1492:A:H62	2.03	0.56
1:A:707:U:H2'	1:A:708:C:C6	2.41	0.56
3:E:39:VAL:HG23	3:E:71:MET:CE	2.36	0.56
4:F:36:ILE:HD13	4:F:64:VAL:HG22	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:B:47:VAL:HG23	13:B:48:PRO:HD3	1.86	0.55
1:A:1435:G:H2'	1:A:1436:U:C6	2.42	0.55
1:A:333:U:OP1	12:T:2:ALA:N	2.39	0.55
1:A:464:U:N3	1:A:467:U:OP2	2.31	0.55
4:F:36:ILE:CD1	4:F:64:VAL:HG22	2.36	0.55
1:A:376:G:H5'	15:A:2890:HOH:O	2.05	0.55
1:A:1485:U:H2'	1:A:1486:G:C8	2.42	0.55
13:B:101:LEU:HB2	13:B:175:GLU:HG2	1.89	0.55
1:A:522:C:H41	7:L:50:ARG:NH2	2.04	0.55
13:B:163:VAL:CG1	13:B:165:ASP:O	2.54	0.55
6:K:20:ALA:N	6:K:82:GLU:O	2.26	0.55
1:A:492:C:H2'	1:A:493:A:C8	2.42	0.54
6:K:93:GLU:HA	6:K:96:ILE:HG12	1.89	0.54
1:A:509:A:N3	1:A:543:U:O2'	2.39	0.54
6:K:28:ASN:OD1	6:K:29:THR:N	2.40	0.54
1:A:1479:C:H2'	1:A:1480:A:C8	2.35	0.54
1:A:384:G:H2'	1:A:385:C:C6	2.41	0.54
1:A:1464:U:H2'	1:A:1465:A:H8	1.73	0.54
6:K:14:GLN:NE2	6:K:77:GLY:O	2.37	0.54
13:B:163:VAL:HG11	13:B:165:ASP:O	2.07	0.54
1:A:171:A:H2'	1:A:172:A:C8	2.42	0.54
1:A:1477:U:H2'	1:A:1478:U:C6	2.42	0.54
2:D:44:ARG:HG2	2:D:46:PRO:HD3	1.89	0.54
1:A:843:U:H2'	1:A:844:G:C8	2.43	0.54
1:A:1097:C:H5''	13:B:143:LYS:HG3	1.89	0.54
1:A:708:C:H2'	1:A:709:U:C6	2.42	0.54
1:A:777:A:H2'	1:A:778:G:H8	1.73	0.54
1:A:1422:G:H2'	1:A:1423:G:H8	1.73	0.54
6:K:55:ARG:HH12	6:K:61:ALA:HB2	1.72	0.54
1:A:216:U:H2'	1:A:217:C:C6	2.43	0.53
1:A:1103:C:O2	13:B:103:ASN:ND2	2.41	0.53
13:B:117:LEU:HG	13:B:141:LEU:HG	1.90	0.53
1:A:459:A:H2'	1:A:460:A:C8	2.42	0.53
9:P:67:ILE:HG22	9:P:68:SER:O	2.08	0.53
1:A:553:A:H5''	7:L:21:VAL:HG21	1.91	0.53
1:A:737:C:H2'	1:A:738:C:H6	1.73	0.53
1:A:751:U:H2'	1:A:752:G:O4'	2.09	0.53
1:A:523:A:C2	7:L:88:LYS:HB3	2.44	0.53
6:K:24:ALA:HB1	6:K:89:GLY:HA3	1.90	0.53
1:A:269:C:H2'	1:A:270:A:C8	2.44	0.53
6:K:64:VAL:HG23	6:K:68:ARG:HH12	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:80:A:H2'	1:A:81:A:C8	2.44	0.53
1:A:687:A:H2	1:A:704:A:C5	2.27	0.53
1:A:1070:U:H2'	1:A:1071:C:C6	2.45	0.52
4:F:12:PRO:O	4:F:44:ARG:NH2	2.43	0.52
1:A:573:A:H5''	15:A:2964:HOH:O	2.09	0.52
1:A:801:U:H2'	1:A:802:A:H8	1.74	0.52
13:B:48:PRO:HA	13:B:51:ASN:ND2	2.25	0.52
1:A:76:G:H2'	15:A:1745:HOH:O	2.09	0.52
7:L:110:ARG:HB3	7:L:119:VAL:HG21	1.92	0.52
13:B:105:LYS:O	13:B:109:GLN:HG2	2.09	0.51
13:B:43:LEU:O	13:B:47:VAL:HG22	2.09	0.51
1:A:127:G:H4'	15:A:2375:HOH:O	2.10	0.51
1:A:459:A:H2'	1:A:460:A:H8	1.76	0.51
1:A:543:U:OP1	2:D:14:ARG:NE	2.43	0.51
13:B:113:ARG:NH1	13:B:116:ASP:OD1	2.44	0.51
1:A:126:G:OP1	1:A:605:U:O2'	2.21	0.51
1:A:202:G:O2'	1:A:468:A:H8	1.94	0.51
13:B:97:LEU:H	13:B:100:MET:HE3	1.76	0.51
13:B:203:ASN:OD1	13:B:204:ASP:N	2.43	0.51
1:A:381:C:H2'	1:A:382:A:O4'	2.11	0.51
1:A:1514:G:H2'	1:A:1515:G:C8	2.46	0.50
1:A:682:G:C2	1:A:683:G:C8	3.00	0.50
1:A:705:G:C4	1:A:706:A:C8	3.00	0.50
1:A:460:A:H2'	1:A:461:A:C8	2.46	0.50
1:A:1482:G:HO2'	1:A:1483:A:H8	1.56	0.50
3:E:166:GLY:O	5:H:114:ARG:NH2	2.44	0.50
13:B:113:ARG:HH12	13:B:117:LEU:HD13	1.77	0.50
1:A:8:A:C6	2:D:206:LYS:HB3	2.47	0.50
1:A:236:A:H2'	1:A:237:G:C8	2.46	0.50
1:A:737:C:H2'	1:A:738:C:C6	2.46	0.50
6:K:91:GLY:O	6:K:94:SER:OG	2.29	0.50
1:A:500:G:H2'	1:A:501:C:C6	2.47	0.50
1:A:1513:A:H2'	1:A:1514:G:C8	2.47	0.50
6:K:27:ASN:O	6:K:56:LYS:NZ	2.35	0.50
1:A:399:G:H2'	1:A:400:C:C6	2.47	0.50
1:A:714:G:H2'	1:A:715:A:C8	2.47	0.50
1:A:618:C:H5''	15:A:2026:HOH:O	2.11	0.50
1:A:545:C:OP1	2:D:58:LYS:NZ	2.45	0.49
2:D:124:MET:HE3	2:D:146:ARG:HD3	1.92	0.49
1:A:451:A:H61	1:A:481:G:H5'	1.76	0.49
1:A:827:U:H2'	1:A:870:U:O4	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:372:C:H5'	15:A:2117:HOH:O	2.10	0.49
1:A:460:A:H2'	1:A:461:A:H8	1.77	0.49
1:A:1384:C:H2'	1:A:1385:G:C8	2.46	0.49
2:D:93:LEU:HG	15:D:318:HOH:O	2.11	0.49
8:O:64:ARG:HH12	8:O:88:ARG:HD3	1.78	0.49
9:P:74:LEU:HA	9:P:77:GLU:HG3	1.93	0.49
13:B:100:MET:HA	13:B:107:VAL:HG21	1.95	0.49
1:A:1398:A:H2'	1:A:1398:A:N3	2.28	0.49
1:A:35:G:H2'	1:A:36:C:C6	2.47	0.49
1:A:121:U:H2'	15:A:3047:HOH:O	2.12	0.49
1:A:335:C:H2'	1:A:336:A:H8	1.77	0.49
1:A:860:A:H2'	1:A:861:G:O4'	2.12	0.49
1:A:1386:G:H2'	1:A:1387:G:C8	2.48	0.49
13:B:98:GLY:HA2	13:B:171:ILE:HD11	1.93	0.49
1:A:477:C:H2'	1:A:478:A:C8	2.48	0.49
1:A:9:G:H5'	3:E:108:GLY:HA3	1.93	0.49
1:A:768:A:H4'	1:A:1523:G:N2	2.28	0.49
5:H:11:LEU:HD22	5:H:75:ILE:HD11	1.94	0.49
7:L:4:VAL:O	7:L:8:VAL:HG13	2.13	0.49
1:A:323:U:H2'	1:A:324:G:O4'	2.13	0.48
1:A:684:U:H2'	1:A:685:G:O4'	2.12	0.48
1:A:60:A:H4'	1:A:61:G:O5'	2.14	0.48
1:A:1074:G:O2'	1:A:1101:A:N1	2.43	0.48
1:A:57:G:H2'	1:A:58:C:C6	2.48	0.48
1:A:142:G:O2'	1:A:196:A:N1	2.46	0.48
1:A:246:A:H2'	15:A:1816:HOH:O	2.12	0.48
1:A:1481:U:H3'	1:A:1482:G:C8	2.47	0.48
4:F:72:ASP:O	4:F:75:GLU:HG3	2.14	0.48
1:A:56:U:H2'	1:A:57:G:C8	2.49	0.48
1:A:337:G:H2'	1:A:338:A:H8	1.77	0.48
3:E:153:VAL:HA	3:E:156:LYS:HE2	1.96	0.48
7:L:14:ARG:NH2	15:L:203:HOH:O	2.47	0.48
6:K:34:THR:OG1	6:K:35:ASP:N	2.47	0.47
1:A:235:C:H2'	1:A:236:A:C8	2.49	0.47
1:A:736:C:H2'	1:A:737:C:C6	2.50	0.47
1:A:437:U:H3'	15:A:1738:HOH:O	2.14	0.47
1:A:704:A:C5	1:A:705:G:C8	3.02	0.47
11:R:21:ILE:HG21	11:R:55:LEU:HD23	1.96	0.47
1:A:746:A:H2'	1:A:747:A:C8	2.49	0.47
1:A:1489:G:H2'	1:A:1490:U:C6	2.50	0.47
1:A:1428:A:H2'	1:A:1429:A:H8	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:K:71:ASP:OD1	6:K:72:ALA:N	2.46	0.47
1:A:834:U:H5	15:A:3204:HOH:O	1.96	0.47
13:B:174:LYS:HA	13:B:177:ASN:ND2	2.30	0.47
1:A:223:A:H2'	1:A:224:U:C6	2.50	0.47
1:A:299:G:H2'	1:A:300:A:C8	2.50	0.47
1:A:1467:C:H2'	1:A:1468:A:C8	2.50	0.47
1:A:704:A:C4	1:A:705:G:C8	3.02	0.47
1:A:1409:C:H2'	1:A:1410:A:H8	1.80	0.47
2:D:11:LEU:HB3	2:D:63:ARG:HD3	1.97	0.47
6:K:23:HIS:HB3	6:K:30:ILE:HG23	1.96	0.47
12:T:25:ARG:NH2	15:T:102:HOH:O	2.41	0.47
12:T:32:ILE:HG12	12:T:54:MET:SD	2.55	0.47
1:A:77:A:H2'	1:A:78:A:C8	2.50	0.47
1:A:501:C:H1'	1:A:549:C:H1'	1.96	0.47
1:A:279:A:H5''	1:A:281:G:O4'	2.15	0.47
1:A:335:C:H2'	1:A:336:A:C8	2.50	0.47
1:A:528:C:H41	7:L:46:ASN:CG	2.20	0.47
1:A:710:G:H5''	4:F:53:LYS:HD2	1.97	0.47
1:A:769:G:H4'	1:A:1513:A:H4'	1.96	0.47
1:A:1465:A:H2'	1:A:1466:C:H6	1.80	0.47
13:B:153:ASP:O	13:B:153:ASP:CG	2.58	0.47
1:A:264:C:O2'	10:Q:66:PRO:O	2.32	0.46
1:A:512:U:H2'	1:A:513:C:C6	2.51	0.46
1:A:371:A:H2'	1:A:372:C:O4'	2.15	0.46
1:A:376:G:C5'	15:A:2890:HOH:O	2.61	0.46
1:A:1398:A:H2	1:A:1399:C:C5	2.34	0.46
1:A:846:G:H2'	1:A:847:G:H8	1.80	0.46
1:A:1081:A:H5'	3:E:23:LYS:HD3	1.96	0.46
1:A:1107:C:C4	1:A:1108:G:C8	3.03	0.46
4:F:12:PRO:HD2	4:F:54:LEU:HD21	1.96	0.46
4:F:42:TRP:HB2	4:F:59:TYR:HB2	1.97	0.46
1:A:250:A:H1'	1:A:251:G:OP2	2.15	0.46
1:A:390:U:H2'	1:A:391:G:C8	2.50	0.46
2:D:55:LEU:O	2:D:59:GLN:HG2	2.16	0.46
1:A:21:G:H2'	1:A:22:G:C8	2.50	0.46
1:A:1465:A:H2'	1:A:1466:C:C6	2.51	0.46
5:H:29:SER:HB3	5:H:57:PRO:HB2	1.96	0.46
1:A:427:U:H3'	1:A:428:G:H2'	1.97	0.46
1:A:471:U:H2'	1:A:472:U:C6	2.51	0.46
1:A:1479:C:C2	1:A:1480:A:C8	3.03	0.46
1:A:118:U:H5	15:A:2661:HOH:O	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:737:C:OP1	4:F:91:ARG:N	2.46	0.46
1:A:801:U:H2'	1:A:802:A:C8	2.50	0.46
1:A:1388:C:H2'	1:A:1389:C:C6	2.50	0.46
5:H:92:LEU:HD12	5:H:117:ARG:HG3	1.97	0.46
1:A:677:U:O2	1:A:777:A:O2'	2.34	0.46
2:D:160:GLU:O	2:D:164:GLN:HG2	2.15	0.46
1:A:1470:U:H2'	1:A:1471:U:C6	2.50	0.46
4:F:11:HIS:ND1	4:F:13:ASP:OD1	2.48	0.46
6:K:86:LYS:HG3	6:K:114:PRO:HD3	1.97	0.46
1:A:468:A:H3'	1:A:469:C:H6	1.81	0.45
1:A:841:C:N4	1:A:845:A:H62	2.14	0.45
2:D:102:VAL:HG13	2:D:107:PHE:HB2	1.98	0.45
1:A:1095:U:OP1	1:A:1108:G:N1	2.39	0.45
1:A:1490:U:H2'	1:A:1491:G:O4'	2.17	0.45
1:A:404:G:N7	2:D:2:ALA:HB3	2.31	0.45
3:E:99:ALA:HB2	3:E:124:LEU:HG	1.99	0.45
1:A:110:C:H2'	1:A:111:G:O4'	2.16	0.45
1:A:1415:G:O6	1:A:1485:U:O2	2.33	0.45
1:A:1481:U:C4	1:A:1482:G:C6	3.04	0.45
1:A:1518:MA6:H2'	1:A:1519:MA6:C8	2.46	0.45
6:K:35:ASP:N	6:K:35:ASP:OD1	2.49	0.45
1:A:579:A:H2'	1:A:580:C:C6	2.51	0.45
2:D:87:GLY:HA3	2:D:197:GLU:HG3	1.99	0.45
1:A:470:C:H2'	1:A:471:U:C6	2.52	0.45
1:A:1106:G:H2'	1:A:1107:C:C6	2.52	0.45
1:A:1446:A:O2'	1:A:1447:A:H5'	2.17	0.45
2:D:13:ARG:HG2	2:D:34:ILE:HA	1.98	0.45
1:A:140:U:H2'	1:A:141:G:O4'	2.17	0.45
1:A:539:A:H2'	1:A:540:G:C8	2.51	0.45
1:A:613:C:H2'	1:A:614:C:H6	1.82	0.45
13:B:67:ILE:HG22	13:B:160:ALA:HB3	1.99	0.45
1:A:15:G:HO2'	3:E:22:SER:HG	1.65	0.44
1:A:816:A:OP1	1:A:1526:G:O2'	2.29	0.44
1:A:834:U:H2'	1:A:835:U:C6	2.52	0.44
1:A:1516:2MG:H2'	1:A:1518:MA6:OP2	2.17	0.44
5:H:105:SER:HB2	5:H:126:ILE:HD11	1.99	0.44
4:F:51:ILE:HD11	11:R:66:SER:HB2	1.98	0.44
10:Q:58:VAL:HB	10:Q:80:GLU:HG2	1.98	0.44
1:A:269:C:H2'	1:A:270:A:H8	1.81	0.44
1:A:264:C:H2'	1:A:265:G:O4'	2.17	0.44
1:A:562:U:H1'	7:L:12:ARG:HB3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1456:A:H2'	1:A:1457:G:O4'	2.17	0.44
5:H:102:ALA:HB3	5:H:113:ASP:HB3	1.99	0.44
13:B:220:THR:HA	13:B:223:GLU:HG2	2.00	0.44
1:A:554:A:H2'	1:A:555:U:C6	2.53	0.44
1:A:715:A:H2'	1:A:716:A:C8	2.53	0.44
1:A:1487:G:O2'	1:A:1488:G:N7	2.40	0.44
1:A:41:G:H2'	1:A:42:G:H8	1.83	0.44
1:A:568:G:O6	7:L:2:ALA:N	2.51	0.44
1:A:594:U:H2'	1:A:595:A:O4'	2.18	0.44
1:A:674:G:H2'	1:A:675:A:H8	1.83	0.44
1:A:690:G:H2'	1:A:691:G:C8	2.51	0.44
1:A:904:U:H2'	1:A:905:U:C6	2.53	0.44
1:A:78:A:H3'	1:A:79:G:C8	2.53	0.44
1:A:161:A:H2'	1:A:162:A:C8	2.52	0.44
1:A:658:C:H2'	1:A:659:U:H6	1.82	0.44
1:A:1386:G:H2'	1:A:1387:G:H8	1.82	0.44
1:A:1480:A:C4	1:A:1481:U:C5	3.06	0.44
6:K:46:ALA:HB1	6:K:61:ALA:HB1	2.00	0.44
2:D:203:LEU:O	2:D:206:LYS:HG2	2.18	0.44
6:K:87:GLY:HA2	6:K:88:PRO:HD3	1.90	0.44
7:L:4:VAL:HG23	10:Q:34:TYR:HB3	2.00	0.44
8:O:79:THR:HA	8:O:82:ILE:HG12	2.00	0.43
2:D:170:TRP:CD2	2:D:186:PRO:HB3	2.53	0.43
1:A:33:A:H2'	1:A:34:C:C6	2.53	0.43
1:A:204:G:H2'	1:A:205:A:H8	1.83	0.43
1:A:429:U:H3'	2:D:9:LEU:HD12	2.00	0.43
1:A:676:A:H2'	1:A:677:U:H6	1.83	0.43
1:A:1491:G:H21	1:A:1492:A:H62	1.66	0.43
5:H:114:ARG:O	5:H:118:GLN:HG2	2.18	0.43
9:P:75:ILE:O	9:P:78:VAL:HG22	2.18	0.43
13:B:90:PHE:CE2	13:B:154:MET:HG2	2.53	0.43
1:A:81:A:H2'	1:A:82:G:H8	1.83	0.43
1:A:181:A:O2'	1:A:194:C:N4	2.49	0.43
1:A:635:A:H2'	1:A:636:U:C6	2.54	0.43
1:A:687:A:C2	1:A:704:A:C5	3.06	0.43
1:A:754:C:O5'	8:O:72:ARG:NH2	2.51	0.43
6:K:55:ARG:NH1	6:K:55:ARG:O	2.46	0.43
1:A:868:C:H2'	1:A:869:G:O4'	2.18	0.43
6:K:52:ARG:HA	6:K:56:LYS:HD3	2.00	0.43
13:B:174:LYS:HA	13:B:177:ASN:HD21	1.84	0.43
1:A:519:C:H2'	1:A:520:A:O4'	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1481:U:H2'	1:A:1482:G:O4'	2.19	0.43
1:A:1484:C:H2'	1:A:1485:U:O4'	2.19	0.43
10:Q:39:LYS:O	10:Q:40:ARG:HD2	2.19	0.43
13:B:14:VAL:HA	13:B:16:PHE:CE1	2.52	0.43
1:A:501:C:H2'	1:A:502:A:C8	2.54	0.43
1:A:662:U:H2'	1:A:663:A:C8	2.54	0.43
1:A:1532:U:H2'	1:A:1533:C:H6	1.82	0.43
7:L:14:ARG:NH1	15:L:203:HOH:O	2.51	0.43
10:Q:10:GLY:HA3	10:Q:25:ILE:HD13	2.01	0.43
1:A:80:A:H2'	1:A:81:A:H8	1.84	0.42
1:A:169:C:H2'	1:A:170:U:C6	2.54	0.42
1:A:857:C:H2'	1:A:858:G:O4'	2.19	0.42
1:A:1090:U:H2'	1:A:1091:U:C6	2.54	0.42
1:A:270:A:H2'	1:A:271:C:C6	2.54	0.42
1:A:184:G:H2'	1:A:185:U:C6	2.54	0.42
1:A:198:G:H3'	15:A:2043:HOH:O	2.18	0.42
1:A:795:C:H2'	1:A:796:C:H6	1.84	0.42
4:F:64:VAL:CG1	4:F:65:GLU:H	2.32	0.42
5:H:89:LYS:HG3	5:H:120:GLY:HA2	2.00	0.42
1:A:575:G:O2'	1:A:821:G:OP2	2.35	0.42
1:A:313:A:H2'	1:A:314:C:C6	2.55	0.42
1:A:873:A:H5''	15:A:2153:HOH:O	2.18	0.42
1:A:911:U:H2'	1:A:912:C:C6	2.53	0.42
1:A:1464:U:H2'	1:A:1465:A:C8	2.54	0.42
12:T:39:ILE:HD11	12:T:83:ILE:HG13	1.99	0.42
1:A:232:G:H1'	1:A:262:A:N1	2.34	0.42
3:E:11:LEU:HD12	3:E:11:LEU:O	2.19	0.42
6:K:17:ASP:HA	6:K:80:ASN:HB2	2.00	0.42
6:K:22:ILE:CG2	6:K:31:VAL:HG23	2.50	0.42
6:K:22:ILE:HG23	6:K:31:VAL:HG23	2.01	0.42
8:O:36:ILE:O	8:O:40:GLN:HG2	2.20	0.42
1:A:41:G:H2'	1:A:42:G:C8	2.55	0.42
1:A:268:U:H2'	1:A:269:C:C6	2.54	0.42
1:A:339:C:H2'	1:A:340:U:C6	2.54	0.42
1:A:485:U:H5''	15:A:3124:HOH:O	2.20	0.42
1:A:688:G:H5'	6:K:48:GLY:HA2	2.02	0.42
3:E:105:ILE:HD11	3:E:120:VAL:O	2.20	0.42
1:A:1385:G:H2'	1:A:1386:G:O4'	2.20	0.42
6:K:92:ARG:HD3	6:K:92:ARG:HA	1.78	0.42
10:Q:26:GLU:OE2	10:Q:39:LYS:HB3	2.20	0.42
1:A:779:C:H2'	1:A:780:A:O4'	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:41:ASP:OD1	4:F:58:HIS:NE2	2.34	0.42
1:A:795:C:H2'	1:A:796:C:C6	2.55	0.42
13:B:18:HIS:CD2	13:B:19:GLN:HG2	2.55	0.42
13:B:187:VAL:O	13:B:201:PRO:HA	2.20	0.42
1:A:82:G:C5	1:A:83:C:H1'	2.55	0.41
1:A:472:U:H2'	1:A:473:U:C6	2.54	0.41
1:A:538:G:H5''	7:L:111:LYS:HB2	2.02	0.41
1:A:1105:A:H2'	1:A:1106:G:H8	1.85	0.41
3:E:11:LEU:HD22	3:E:71:MET:CE	2.47	0.41
3:E:151:GLU:CD	3:E:151:GLU:H	2.28	0.41
1:A:113:G:H2'	1:A:114:U:C6	2.54	0.41
1:A:704:A:H3'	1:A:705:G:H8	1.85	0.41
1:A:707:U:H2'	1:A:708:C:H6	1.84	0.41
1:A:751:U:H5	15:A:2771:HOH:O	2.03	0.41
2:D:150:LYS:HE2	2:D:150:LYS:HB3	1.81	0.41
1:A:235:C:H2'	1:A:236:A:H8	1.84	0.41
1:A:255:G:H4'	10:Q:19:LYS:HD3	2.02	0.41
1:A:1463:U:H2'	1:A:1464:U:C6	2.55	0.41
1:A:1467:C:H2'	1:A:1468:A:H8	1.84	0.41
6:K:59:PRO:O	6:K:63:GLN:HG2	2.20	0.41
13:B:32:PHE:HB2	13:B:42:ASN:HA	2.02	0.41
1:A:73:C:HO2'	1:A:74:A:H8	1.68	0.41
1:A:176:C:H2'	1:A:177:G:N3	2.36	0.41
1:A:184:G:H2'	1:A:185:U:H6	1.84	0.41
1:A:593:U:H2'	1:A:594:U:C6	2.55	0.41
1:A:672:U:H2'	1:A:673:A:C8	2.55	0.41
2:D:107:PHE:HB3	2:D:145:ILE:HD11	2.01	0.41
1:A:321:A:H2'	1:A:322:C:C6	2.54	0.41
1:A:747:A:H2'	1:A:748:G:O4'	2.19	0.41
1:A:1433:A:H2'	1:A:1434:A:C8	2.56	0.41
1:A:1488:G:O5'	1:A:1488:G:H8	2.04	0.41
1:A:1521:C:H2'	1:A:1522:U:C6	2.55	0.41
1:A:73:C:O2'	1:A:74:A:H8	2.03	0.41
1:A:678:U:H2'	1:A:679:C:H6	1.86	0.41
1:A:1421:G:H2'	1:A:1422:G:H8	1.85	0.41
1:A:90:C:HO2'	1:A:91:U:H6	1.67	0.41
1:A:246:A:N1	1:A:278:G:O2'	2.44	0.41
1:A:1427:C:H2'	1:A:1428:A:H8	1.85	0.41
3:E:11:LEU:HD12	3:E:11:LEU:C	2.45	0.41
1:A:160:A:H2'	1:A:161:A:O4'	2.20	0.41
1:A:382:A:H5''	15:A:2503:HOH:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:602:A:H2'	1:A:603:U:C6	2.56	0.41
1:A:900:A:H2'	1:A:901:A:C8	2.55	0.41
1:A:1399:C:H5'	1:A:1400:C:OP2	2.21	0.41
8:O:26:GLU:OE1	8:O:26:GLU:N	2.47	0.41
1:A:31:G:O2'	1:A:48:C:N4	2.54	0.41
1:A:83:C:H2'	1:A:85:U:H3	1.86	0.41
1:A:123:U:OP1	1:A:312:C:H5'	2.21	0.41
1:A:224:U:H2'	1:A:225:C:C6	2.56	0.41
1:A:558:G:H5'	15:A:2899:HOH:O	2.21	0.41
1:A:689:C:H2'	1:A:690:G:C8	2.56	0.41
1:A:821:G:H2'	1:A:822:U:C6	2.56	0.41
1:A:1070:U:H2'	1:A:1071:C:H6	1.83	0.41
1:A:1384:C:H2'	1:A:1385:G:H8	1.86	0.41
1:A:1481:U:C4	1:A:1482:G:C5	3.09	0.41
5:H:7:ILE:O	5:H:11:LEU:HG	2.21	0.41
13:B:132:LYS:O	13:B:136:MET:HG2	2.20	0.41
1:A:470:C:H2'	1:A:471:U:H6	1.86	0.41
1:A:584:G:H2'	1:A:585:G:H8	1.85	0.41
1:A:1430:A:H2'	1:A:1431:A:C8	2.56	0.41
3:E:14:LYS:HE2	3:E:14:LYS:HB2	1.92	0.41
6:K:19:VAL:HB	6:K:36:ARG:NH2	2.36	0.41
8:O:68:ASP:O	8:O:72:ARG:HG2	2.21	0.41
1:A:20:U:H2'	1:A:21:G:O4'	2.21	0.40
1:A:81:A:H2'	1:A:82:G:C8	2.56	0.40
1:A:303:A:H2'	1:A:304:U:O4'	2.21	0.40
1:A:320:A:H2'	1:A:321:A:O4'	2.21	0.40
12:T:28:MET:HE1	12:T:67:ILE:HG21	2.03	0.40
1:A:684:U:H1'	6:K:39:ASN:HA	2.03	0.40
1:A:846:G:H2'	1:A:847:G:C8	2.56	0.40
4:F:37:HIS:HB3	4:F:97:THR:HG22	2.04	0.40
4:F:46:GLN:HA	4:F:56:LYS:HA	2.02	0.40
6:K:14:GLN:HE22	6:K:77:GLY:C	2.27	0.40
6:K:90:PRO:O	6:K:92:ARG:NH1	2.54	0.40
13:B:103:ASN:O	13:B:107:VAL:HG23	2.21	0.40
1:A:517:G:N7	15:A:1746:HOH:O	2.37	0.40
1:A:570:G:H2'	1:A:571:U:C6	2.55	0.40
1:A:864:A:H2'	1:A:865:A:C8	2.56	0.40
1:A:1387:G:H2'	1:A:1388:C:C6	2.55	0.40
1:A:18:C:H4'	1:A:1078:U:O2	2.21	0.40
6:K:16:SER:HA	6:K:79:LYS:H	1.85	0.40
1:A:75:G:C6	1:A:76:G:C5	3.10	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:305:G:H2'	15:A:2257:HOH:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	203/205 (99%)	201 (99%)	2 (1%)	0	100	100
3	E	155/157 (99%)	150 (97%)	5 (3%)	0	100	100
4	F	104/106 (98%)	103 (99%)	1 (1%)	0	100	100
5	H	127/129 (98%)	123 (97%)	4 (3%)	0	100	100
6	K	115/117 (98%)	110 (96%)	5 (4%)	0	100	100
7	L	120/123 (98%)	117 (98%)	3 (2%)	0	100	100
8	O	86/88 (98%)	85 (99%)	1 (1%)	0	100	100
9	P	80/82 (98%)	76 (95%)	4 (5%)	0	100	100
10	Q	78/80 (98%)	77 (99%)	1 (1%)	0	100	100
11	R	53/55 (96%)	53 (100%)	0	0	100	100
12	T	84/86 (98%)	84 (100%)	0	0	100	100
13	B	222/224 (99%)	209 (94%)	13 (6%)	0	100	100
All	All	1427/1452 (98%)	1388 (97%)	39 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM

entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	D	172/172 (100%)	172 (100%)	0	100	100
3	E	119/119 (100%)	119 (100%)	0	100	100
4	F	92/92 (100%)	92 (100%)	0	100	100
5	H	104/104 (100%)	104 (100%)	0	100	100
6	K	90/90 (100%)	90 (100%)	0	100	100
7	L	102/102 (100%)	102 (100%)	0	100	100
8	O	76/76 (100%)	76 (100%)	0	100	100
9	P	65/65 (100%)	65 (100%)	0	100	100
10	Q	74/74 (100%)	74 (100%)	0	100	100
11	R	48/48 (100%)	48 (100%)	0	100	100
12	T	65/65 (100%)	65 (100%)	0	100	100
13	B	186/186 (100%)	186 (100%)	0	100	100
All	All	1193/1193 (100%)	1193 (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 (12) such sidechains are listed below:

Mol	Chain	Res	Type
2	D	196	ASN
3	E	122	ASN
5	H	4	GLN
5	H	21	ASN
6	K	14	GLN
8	O	37	ASN
8	O	40	GLN
9	P	9	HIS
9	P	59	HIS
12	T	3	ASN
12	T	78	ASN
13	B	18	HIS

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1123/1542 (72%)	165 (14%)	5 (0%)

All (165) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	4	U
1	A	6	G
1	A	9	G
1	A	22	G
1	A	32	A
1	A	39	G
1	A	44	A
1	A	47	C
1	A	48	C
1	A	50	A
1	A	51	A
1	A	52	C
1	A	72	A
1	A	74	A
1	A	75	G
1	A	76	G
1	A	80	A
1	A	84	U
1	A	85	U
1	A	86	G
1	A	87	C
1	A	88	U
1	A	89	U
1	A	90	C
1	A	91	U
1	A	116	A
1	A	120	A
1	A	130	A
1	A	131	A
1	A	141	G
1	A	149	A
1	A	151	A
1	A	189	A
1	A	196	A
1	A	197	A
1	A	210	C
1	A	244	U
1	A	245	U

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Mol	Chain	Res	Type
1	A	247	G
1	A	251	G
1	A	266	G
1	A	267	C
1	A	289	G
1	A	321	A
1	A	328	C
1	A	332	G
1	A	348	G
1	A	352	C
1	A	354	G
1	A	367	U
1	A	372	C
1	A	373	A
1	A	384	G
1	A	398	U
1	A	406	G
1	A	412	A
1	A	413	G
1	A	421	U
1	A	422	C
1	A	423	G
1	A	424	G
1	A	429	U
1	A	456	A
1	A	457	G
1	A	458	U
1	A	467	U
1	A	468	A
1	A	481	G
1	A	484	G
1	A	486	U
1	A	495	A
1	A	511	C
1	A	518	C
1	A	521	G
1	A	527	G7M
1	A	532	A
1	A	533	A
1	A	547	A
1	A	559	A
1	A	562	U

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Mol	Chain	Res	Type
1	A	564	C
1	A	572	A
1	A	573	A
1	A	576	C
1	A	596	A
1	A	618	C
1	A	619	U
1	A	633	G
1	A	650	G
1	A	653	U
1	A	665	A
1	A	682	G
1	A	686	U
1	A	687	A
1	A	693	G
1	A	702	A
1	A	703	G
1	A	704	A
1	A	723	U
1	A	724	G
1	A	734	G
1	A	748	G
1	A	755	G
1	A	787	A
1	A	789	U
1	A	790	A
1	A	791	G
1	A	792	A
1	A	793	U
1	A	794	A
1	A	815	A
1	A	817	C
1	A	821	G
1	A	828	U
1	A	841	C
1	A	842	U
1	A	845	A
1	A	849	G
1	A	885	G
1	A	914	A
1	A	923	A
1	A	926	G

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Mol	Chain	Res	Type
1	A	927	G
1	A	934	C
1	A	935	A
1	A	1064	G
1	A	1065	U
1	A	1085	U
1	A	1094	G
1	A	1095	U
1	A	1101	A
1	A	1104	G
1	A	1108	G
1	A	1381	U
1	A	1387	G
1	A	1397	C
1	A	1398	A
1	A	1400	C
1	A	1412	C
1	A	1414	U
1	A	1415	G
1	A	1417	G
1	A	1441	A
1	A	1446	A
1	A	1452	C
1	A	1475	G
1	A	1478	U
1	A	1479	C
1	A	1486	G
1	A	1487	G
1	A	1488	G
1	A	1489	G
1	A	1492	A
1	A	1493	A
1	A	1494	G
1	A	1503	A
1	A	1506	U
1	A	1508	A
1	A	1509	C
1	A	1518	MA6
1	A	1520	C
1	A	1529	G
1	A	1530	G
1	A	1532	U

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Mol	Chain	Res	Type
1	A	1535	C

All (5) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	250	A
1	A	428	G
1	A	791	G
1	A	1103	C
1	A	1492	A

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

6 non-standard protein/DNA/RNA residues 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
1	G7M	A	527	1	20,26,27	1.13	3 (15%)	17,39,42	0.46	0
1	PSU	A	516	14,1	18,21,22	1.02	1 (5%)	22,30,33	1.86	6 (27%)
1	2MG	A	1516	1	18,26,27	0.87	1 (5%)	16,38,41	1.24	3 (18%)
1	MA6	A	1519	1	18,26,27	0.96	1 (5%)	19,38,41	1.67	6 (31%)
1	MA6	A	1518	1	18,26,27	0.95	1 (5%)	19,38,41	1.78	6 (31%)
7	D2T	L	89	7	7,9,10	1.33	1 (14%)	6,11,13	1.57	2 (33%)

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
1	G7M	A	527	1	-	1/3/25/26	0/3/3/3
1	PSU	A	516	14,1	-	0/7/25/26	0/2/2/2
1	2MG	A	1516	1	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	MA6	A	1519	1	-	3/7/29/30	0/3/3/3
1	MA6	A	1518	1	-	4/7/29/30	0/3/3/3
7	D2T	L	89	7	-	3/7/12/14	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	527	G7M	C8-N9	3.38	1.39	1.33
1	A	516	PSU	C6-C5	3.09	1.38	1.35
1	A	1519	MA6	C5-C4	2.59	1.47	1.40
1	A	1518	MA6	C5-C4	2.52	1.47	1.40
1	A	527	G7M	C5-C6	-2.34	1.39	1.45
1	A	1516	2MG	C6-N1	-2.32	1.34	1.37
1	A	527	G7M	C8-N7	2.28	1.37	1.33
7	L	89	D2T	CB1-SB	-2.03	1.75	1.79

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	516	PSU	N1-C2-N3	4.78	120.55	115.13
1	A	516	PSU	C4-N3-C2	-4.71	119.55	126.34
1	A	1518	MA6	N1-C6-N6	3.89	121.15	117.06
1	A	1519	MA6	C9-N6-C6	-3.45	109.06	119.51
1	A	1518	MA6	C9-N6-C6	-3.21	109.79	119.51
1	A	1519	MA6	N3-C2-N1	-3.13	123.78	128.68
1	A	1518	MA6	C10-N6-C6	-3.04	110.30	119.51
1	A	1519	MA6	C4-C5-N7	-2.95	106.33	109.40
1	A	1518	MA6	C4-C5-N7	-2.90	106.38	109.40
1	A	1518	MA6	N3-C2-N1	-2.90	124.15	128.68
1	A	1519	MA6	N1-C6-N6	2.63	119.82	117.06
1	A	1516	2MG	CM2-N2-C2	-2.61	118.11	123.86
1	A	1519	MA6	C10-N6-C6	-2.52	111.87	119.51
1	A	516	PSU	O2-C2-N1	-2.49	120.05	122.79
1	A	1516	2MG	C8-N7-C5	2.35	107.47	102.99
1	A	1516	2MG	C5-C6-N1	2.33	118.06	113.95
1	A	1519	MA6	C10-N6-C9	-2.31	108.67	116.12
1	A	516	PSU	C6-C5-C4	2.18	119.72	118.20
1	A	516	PSU	O4'-C1'-C2'	2.18	108.21	105.14
7	L	89	D2T	O-C-CA	-2.16	119.11	124.78
1	A	516	PSU	C6-N1-C2	-2.08	120.55	122.68
7	L	89	D2T	CB-CA-N	2.04	113.45	109.10

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1518	MA6	C10-N6-C9	-2.04	109.54	116.12

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1518	MA6	O4'-C4'-C5'-O5'
1	A	1518	MA6	C3'-C4'-C5'-O5'
7	L	89	D2T	O-C-CA-CB
1	A	1519	MA6	C3'-C4'-C5'-O5'
1	A	1519	MA6	O4'-C4'-C5'-O5'
1	A	1518	MA6	C5-C6-N6-C10
1	A	1519	MA6	C5-C6-N6-C10
7	L	89	D2T	CG-CB-SB-CB1
7	L	89	D2T	SB-CB-CG-OD1
1	A	527	G7M	C4'-C5'-O5'-P
1	A	1518	MA6	N1-C6-N6-C10

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1516	2MG	1	0
1	A	1519	MA6	2	0
1	A	1518	MA6	2	0
7	L	89	D2T	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 39 ligands modelled in this entry, 39 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

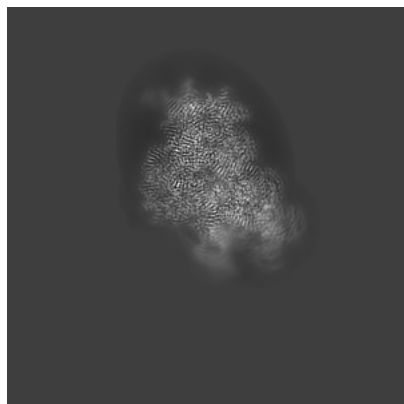
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-67202. These allow visual inspection of the internal detail of the map and identification of artifacts.

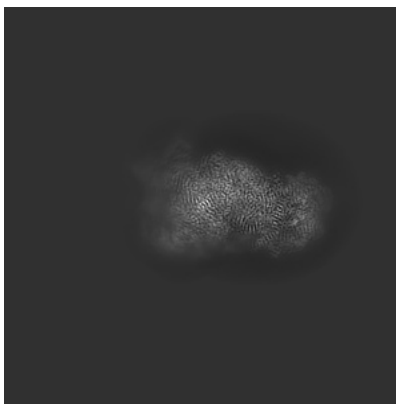
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

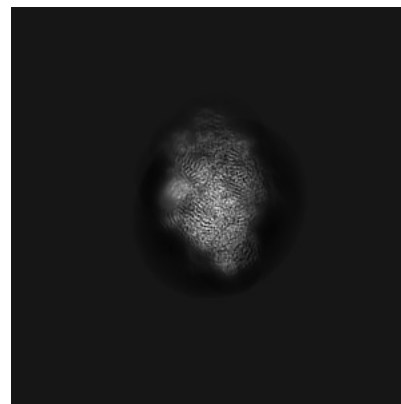
6.1.1 Primary map



X

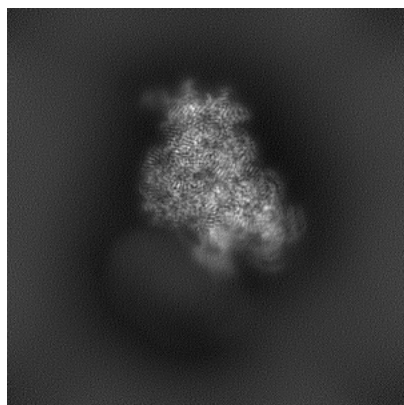


Y

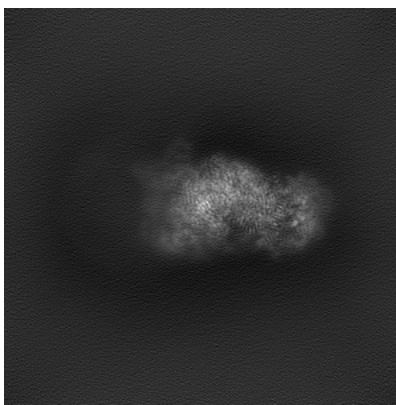


Z

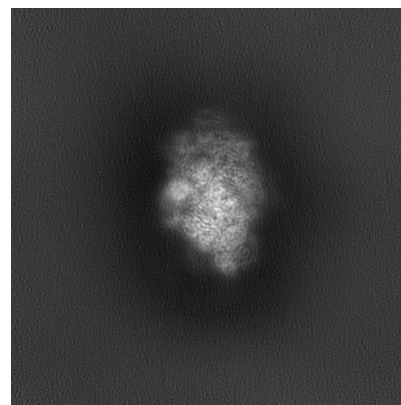
6.1.2 Raw map



X



Y

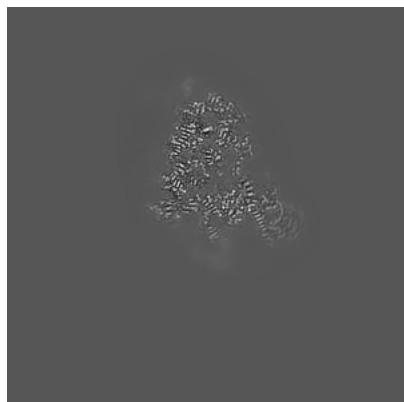


Z

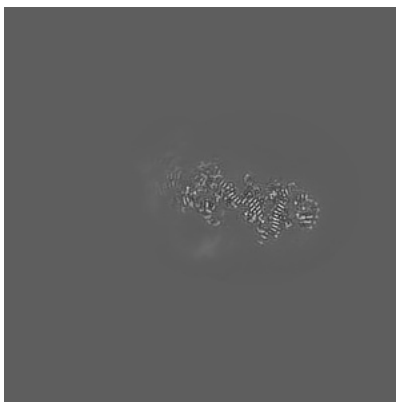
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

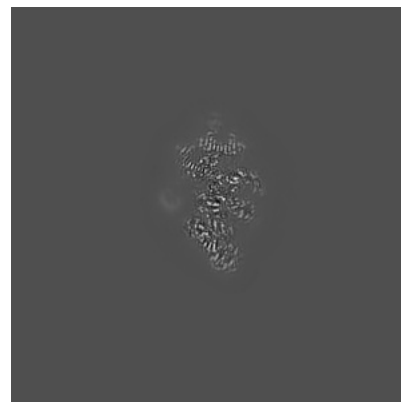
6.2.1 Primary map



X Index: 220

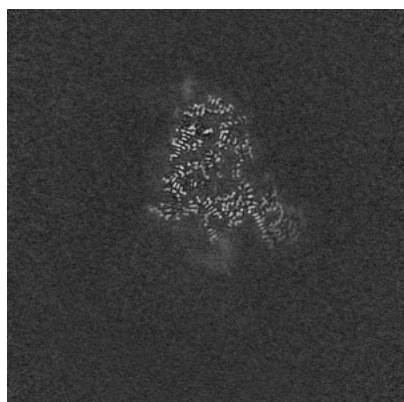


Y Index: 220

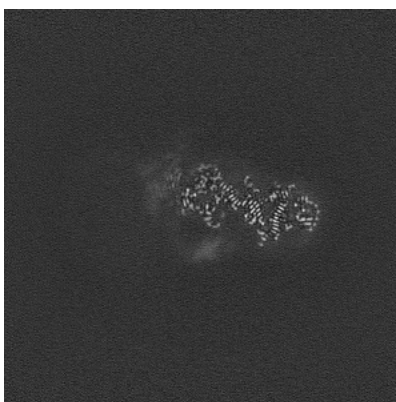


Z Index: 220

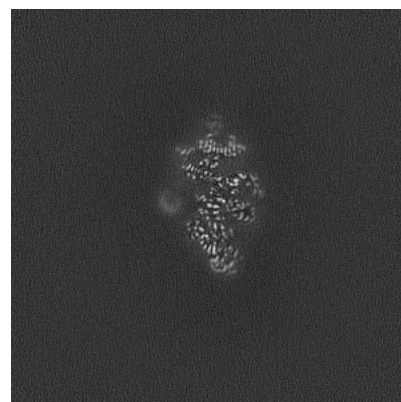
6.2.2 Raw map



X Index: 220



Y Index: 220

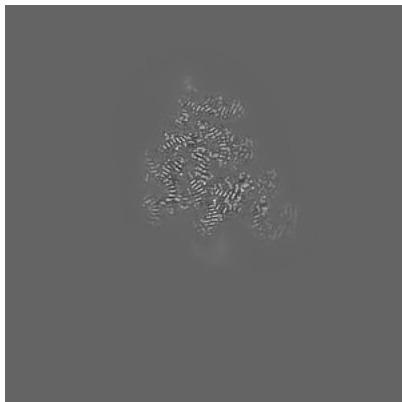


Z Index: 220

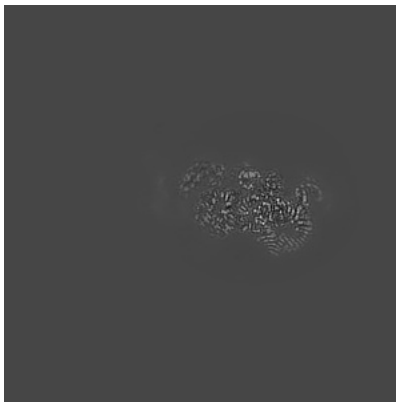
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

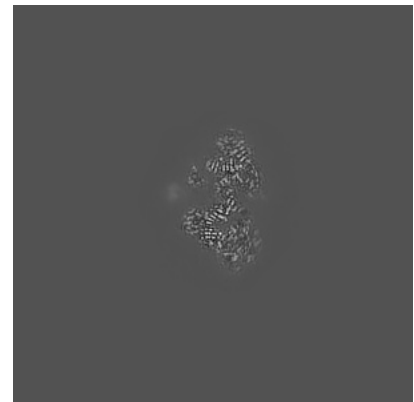
6.3.1 Primary map



X Index: 229

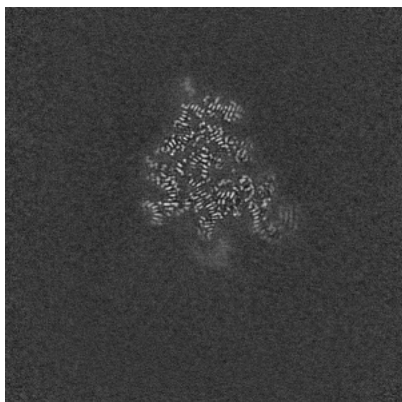


Y Index: 206

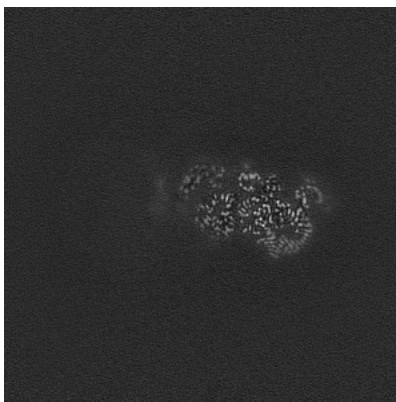


Z Index: 245

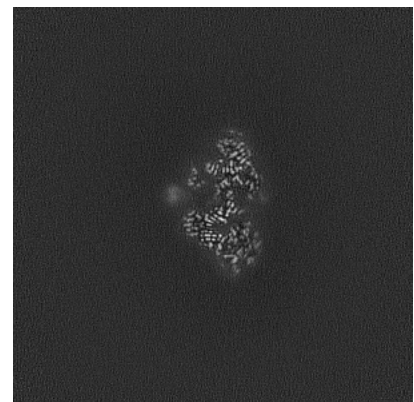
6.3.2 Raw map



X Index: 226



Y Index: 206

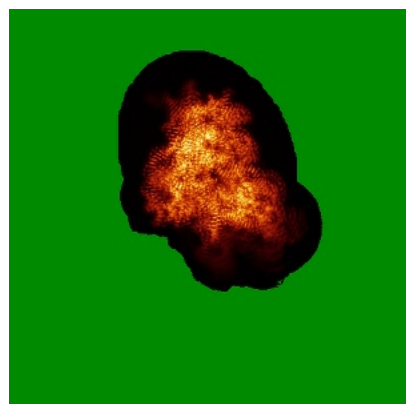


Z Index: 245

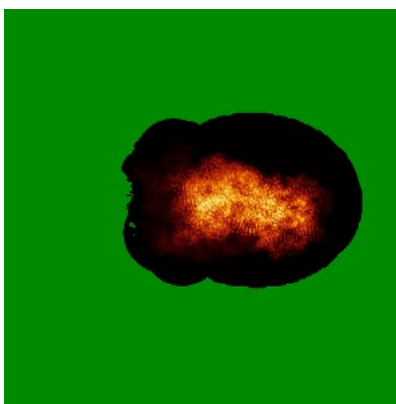
The images above show the largest variance slices of the map in three orthogonal directions.

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

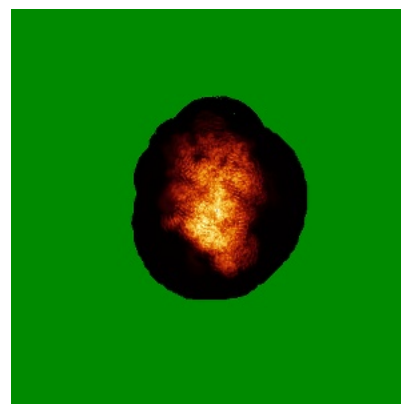
6.4.1 Primary map



X

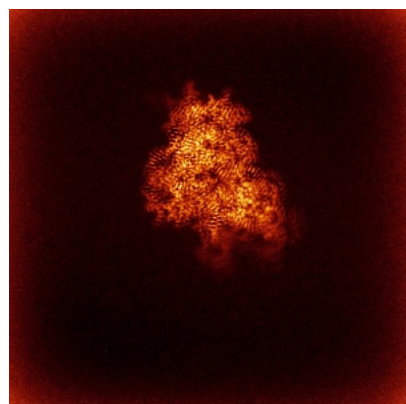


Y

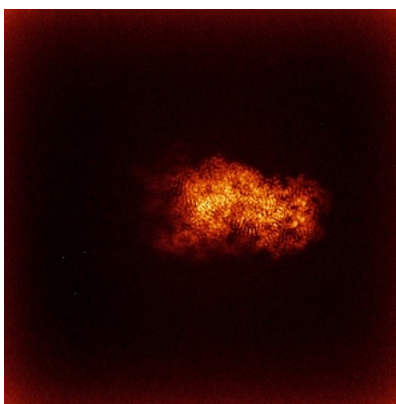


Z

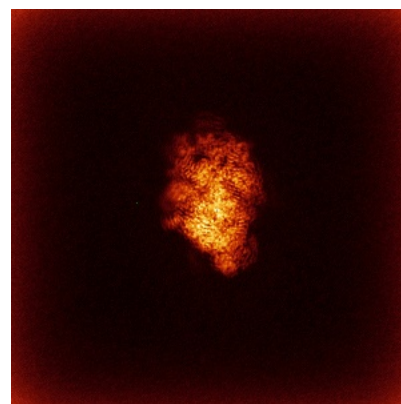
6.4.2 Raw map



X



Y

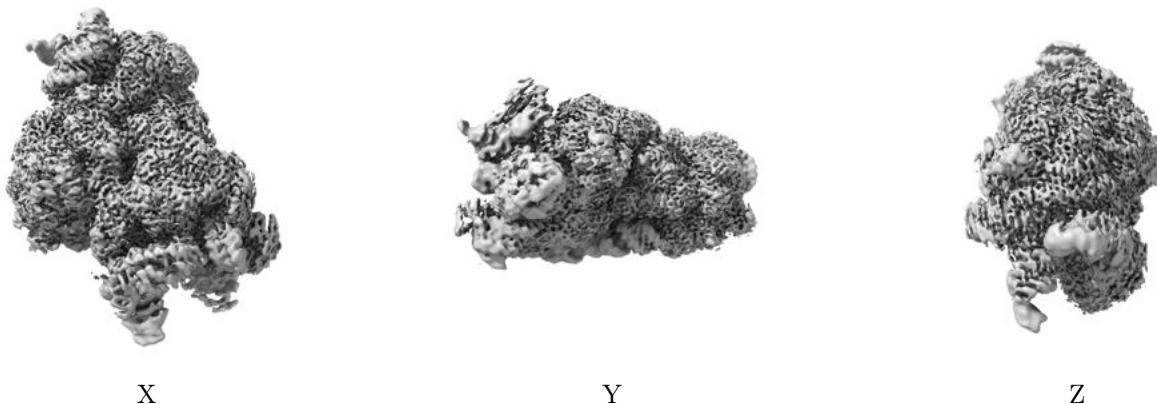


Z

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.

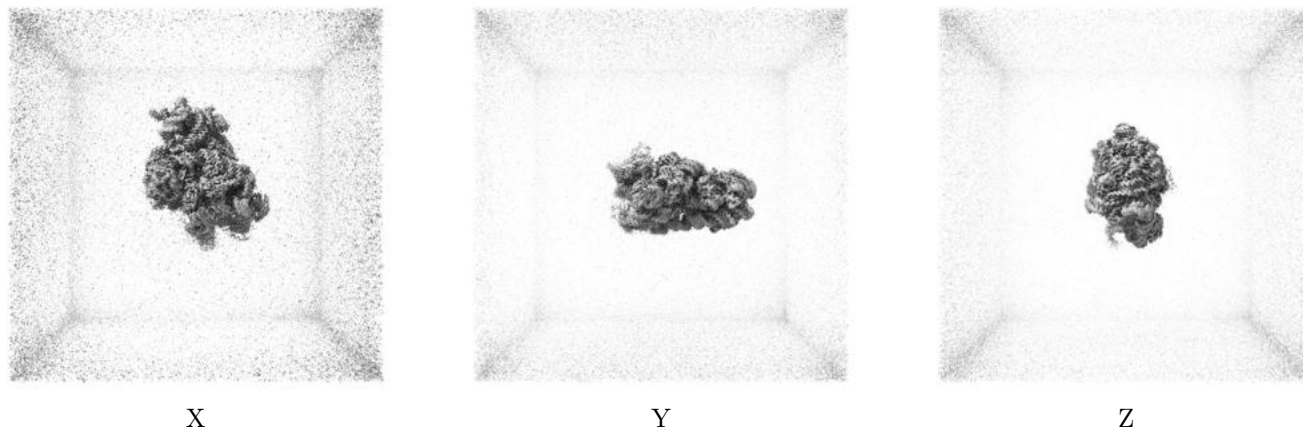
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.13. 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.

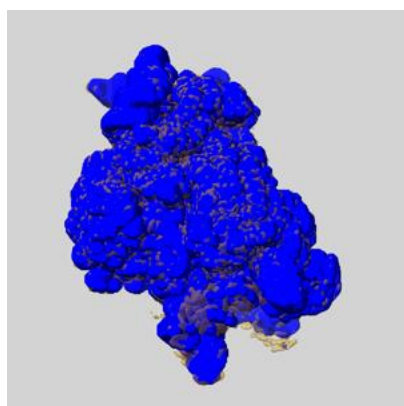
6.6 Mask visualisation [i](#)

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

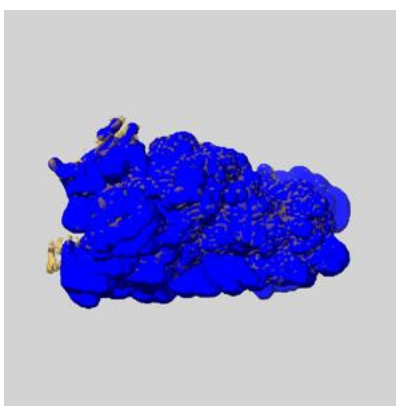
A mask typically either:

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

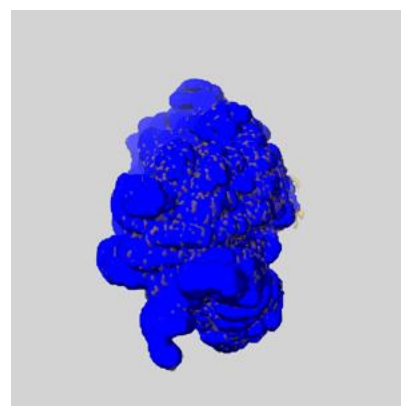
6.6.1 emd_67202_msk_1.map [i](#)



X



Y

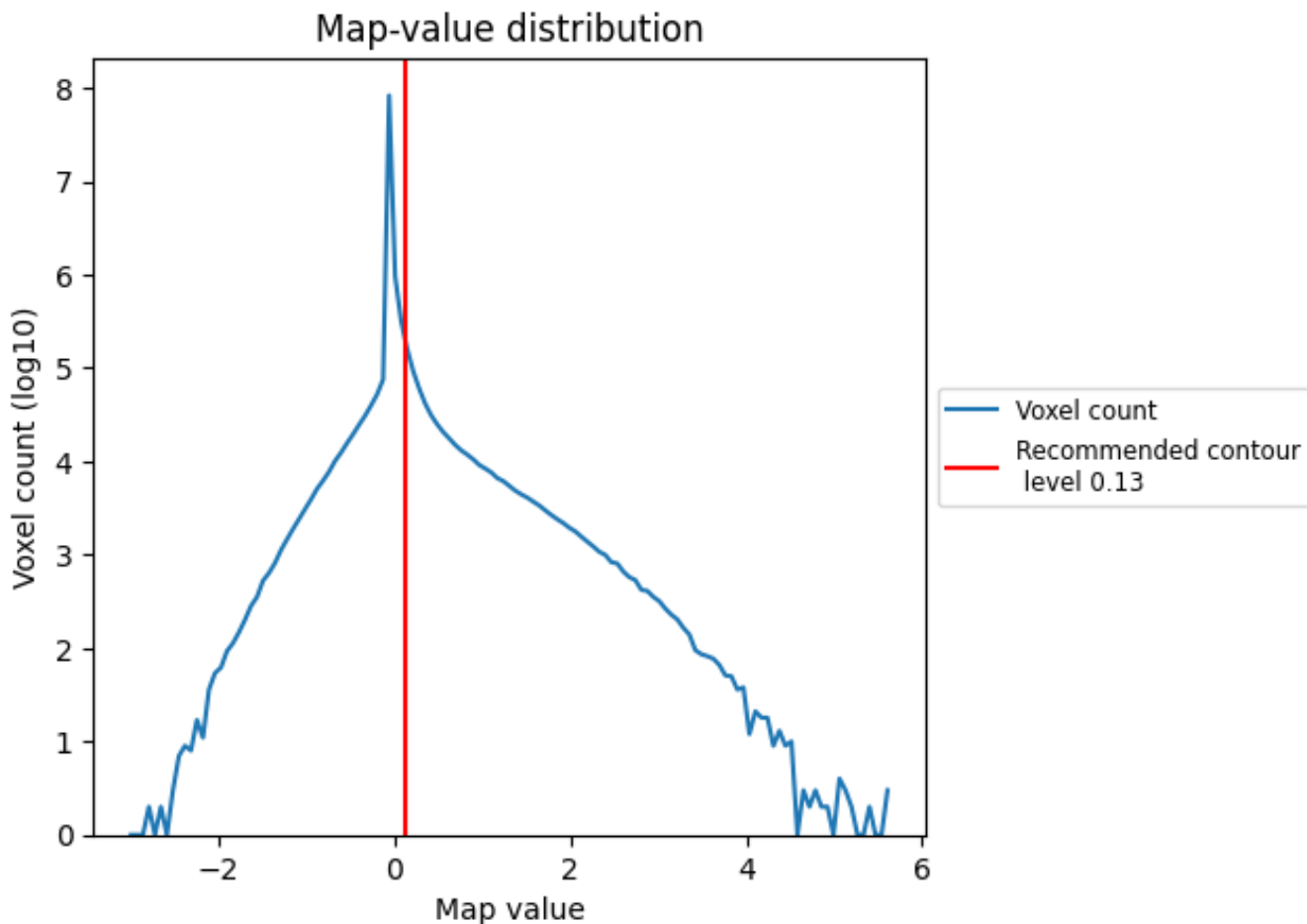


Z

7 Map analysis [i](#)

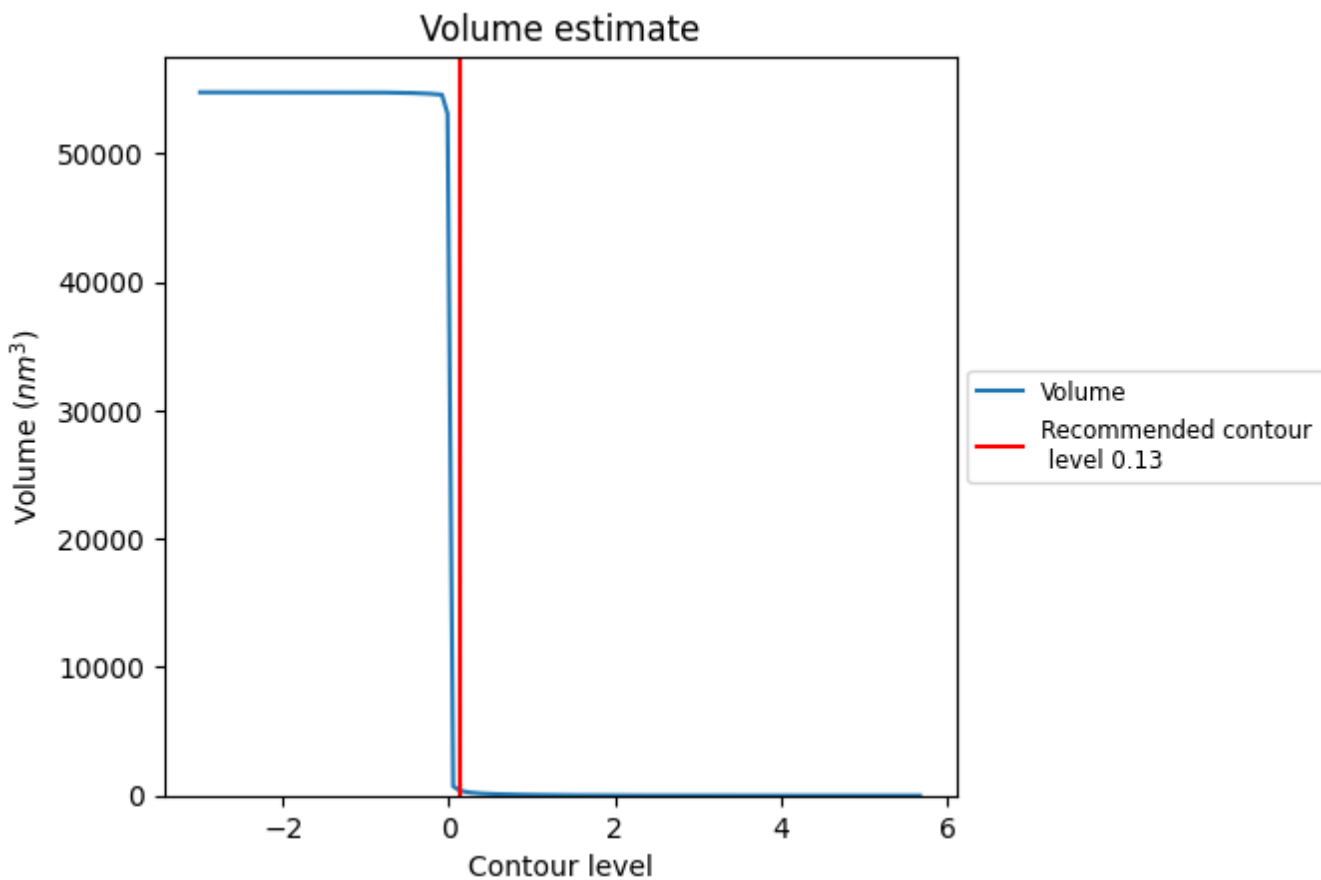
This section contains the results of statistical analysis of the map.

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.

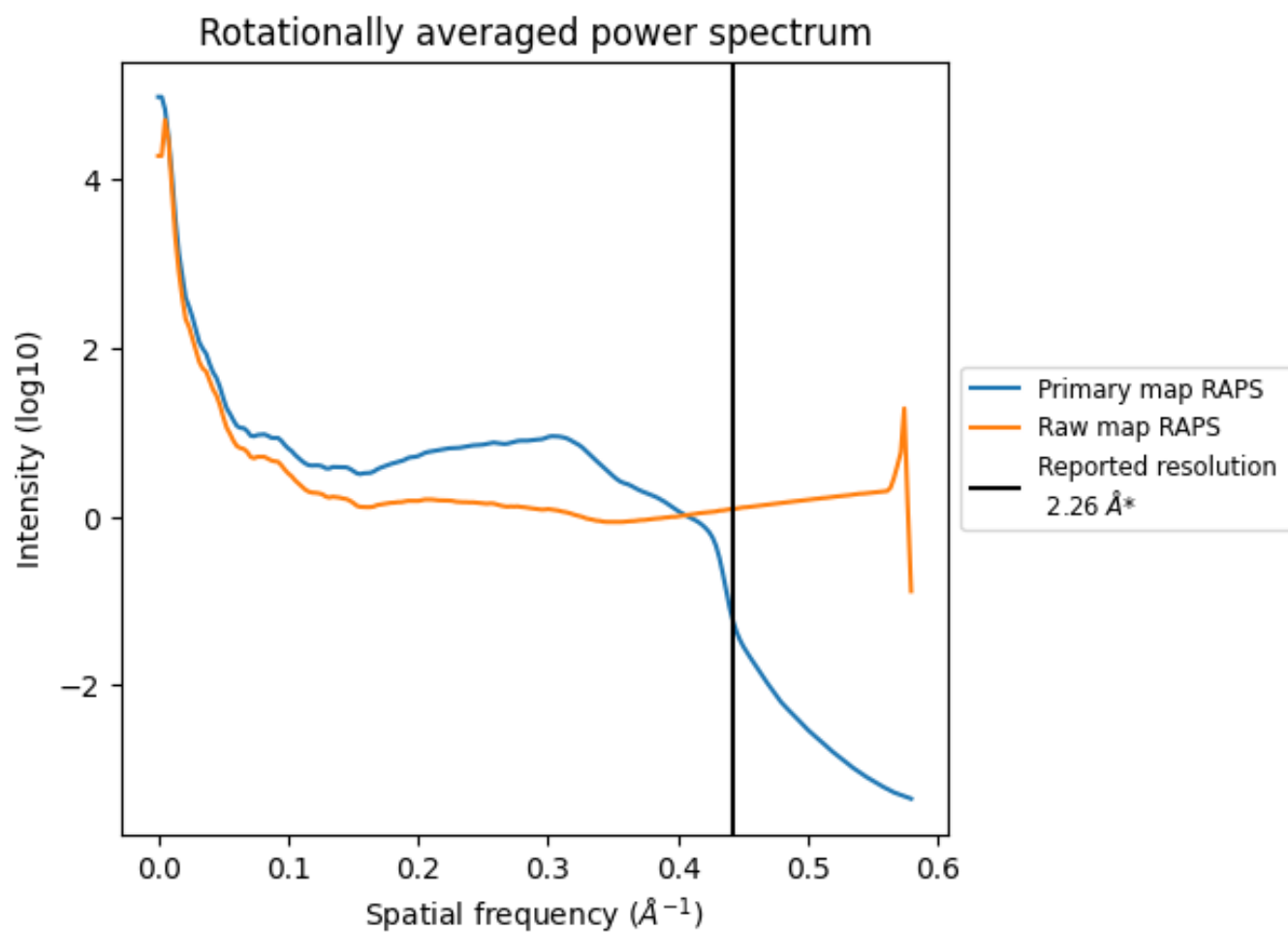
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 416 nm³; this corresponds to an approximate mass of 376 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum i

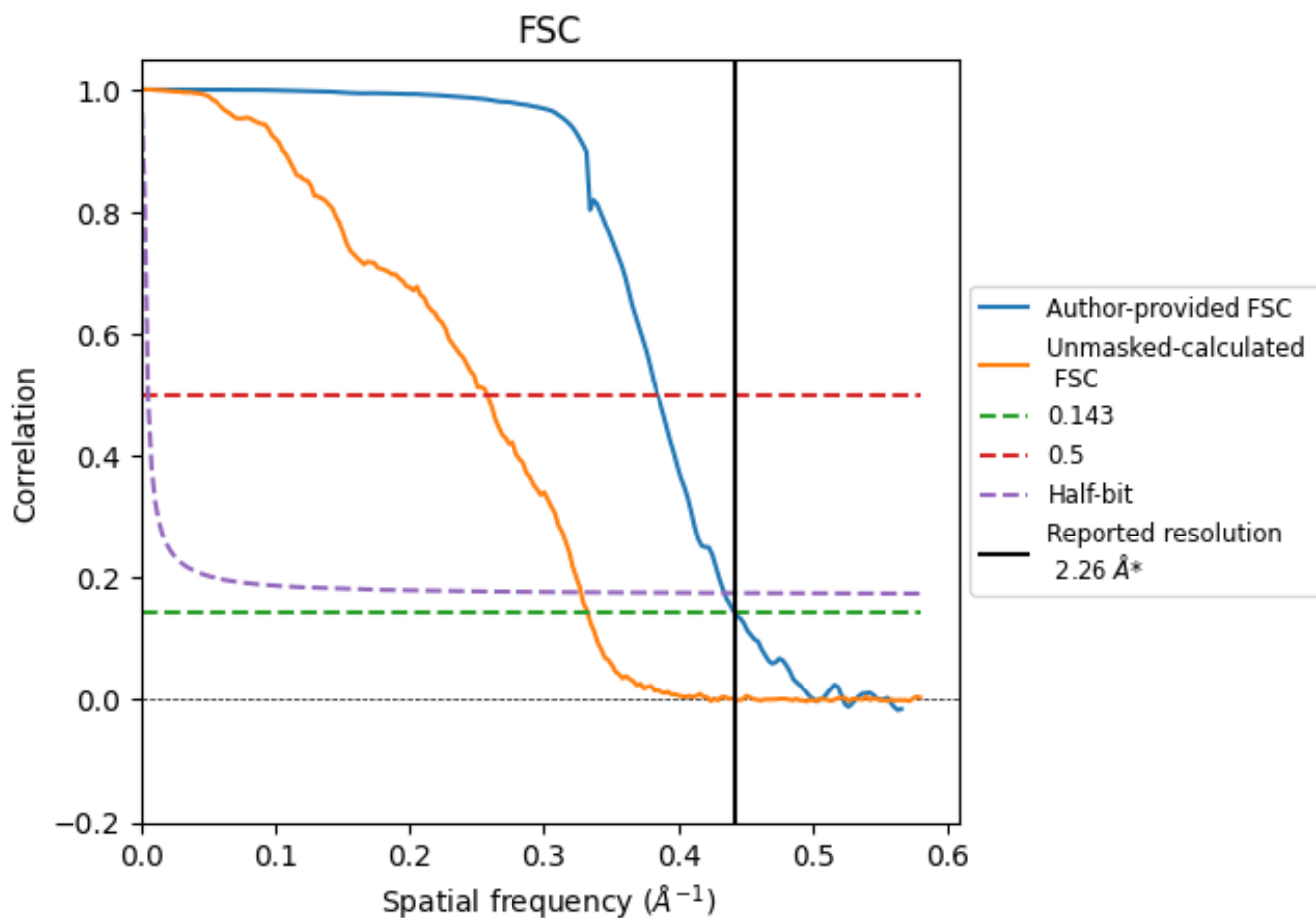


*Reported resolution corresponds to spatial frequency of 0.442 \AA^{-1}

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 0.442 Å⁻¹

8.2 Resolution estimates [i](#)

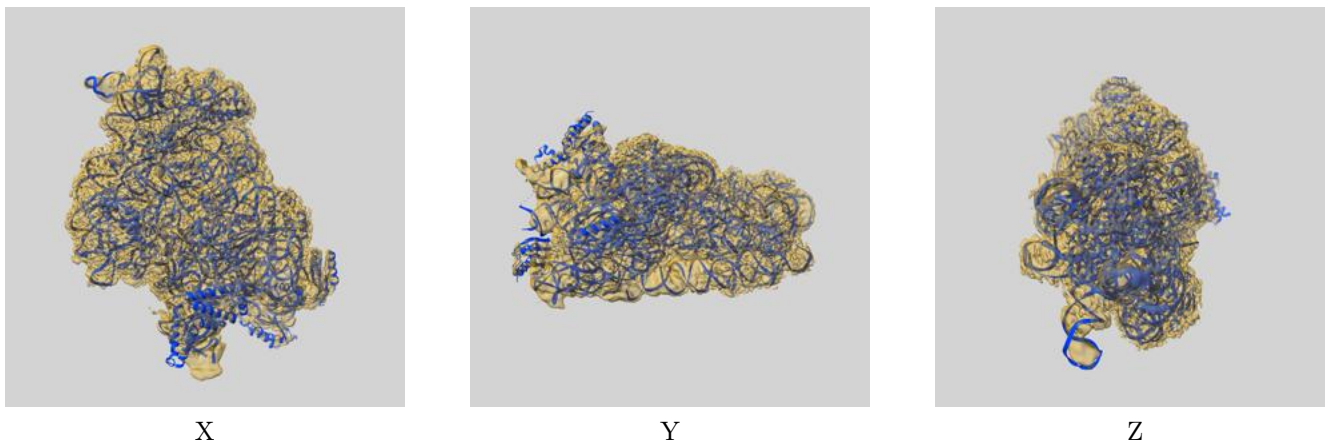
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.26	-	-
Author-provided FSC curve	2.26	2.60	2.30
Unmasked-calculated*	3.01	3.89	3.06

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.01 differs from the reported value 2.26 by more than 10 %

9 Map-model fit [i](#)

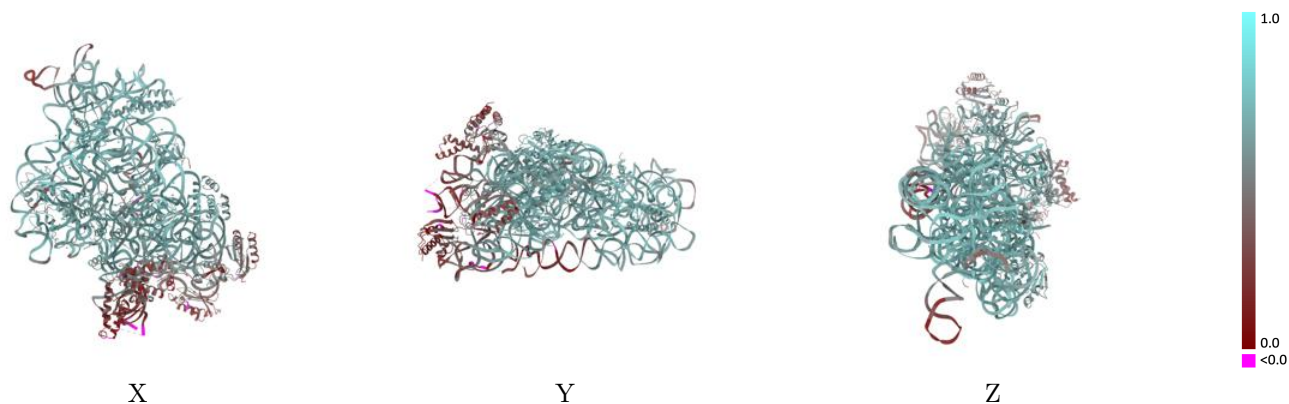
This section contains information regarding the fit between EMDB map EMD-67202 and PDB model 9XTD. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



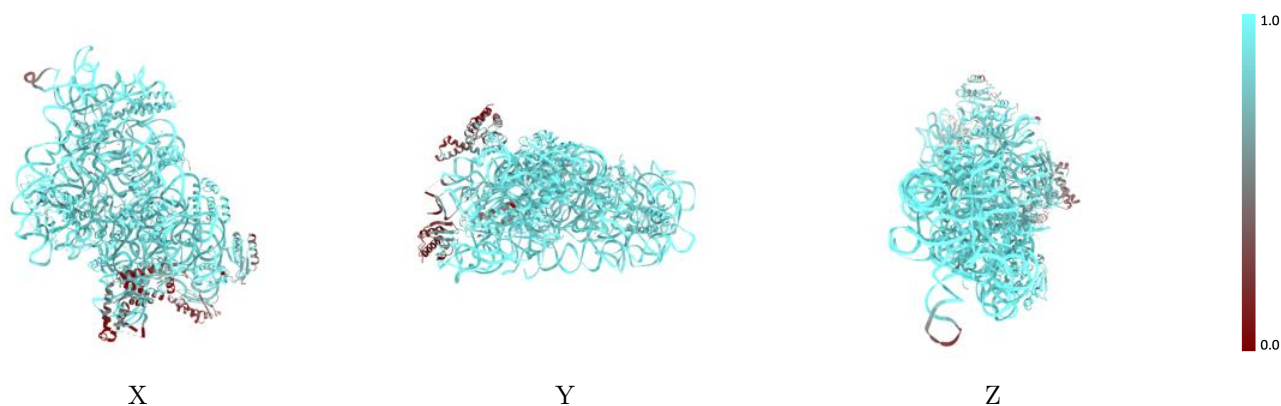
The images above show the 3D surface view of the map at the recommended contour level 0.13 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



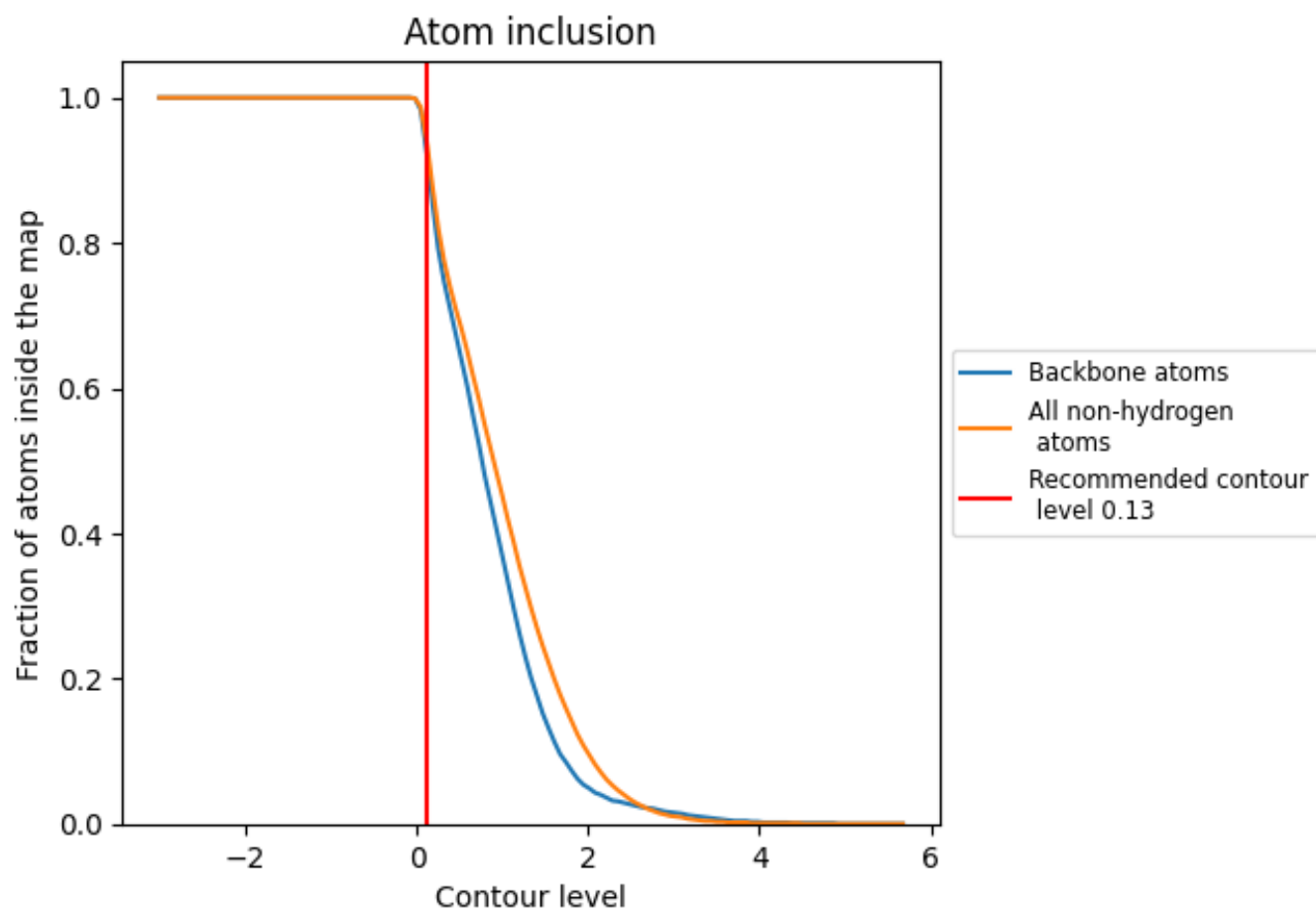
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.13).





























9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 93% of all non-hydrogen atoms, are inside the map.

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

The table lists the average atom inclusion at the recommended contour level (0.13) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9320	 0.5900
A	 0.9750	 0.6080
B	 0.4950	 0.3290
D	 0.9680	 0.6330
E	 0.9820	 0.6440
F	 0.7660	 0.3890
H	 0.9800	 0.6740
K	 0.4340	 0.2710
L	 0.9780	 0.6830
O	 0.9590	 0.6010
P	 0.9680	 0.7080
Q	 0.9730	 0.6460
R	 0.9080	 0.5290
T	 0.9890	 0.6930

