



wwPDB EM Validation Summary Report ⓘ

Jun 29, 2024 – 09:31 am BST

PDB ID : 8R0B
EMDB ID : EMD-18789
Title : Cryo-EM structure of the cross-exon pre-B+ATP complex
Authors : Zhang, Z.; Kumar, V.; Dybkov, O.; Will, C.L.; Zhong, J.; Ludwig, S.; Urlaub, H.; Kastner, B.; Stark, H.; Luehrmann, R.
Deposited on : 2023-10-31
Resolution : 4.40 Å(reported)

This is a wwPDB EM Validation Summary 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:

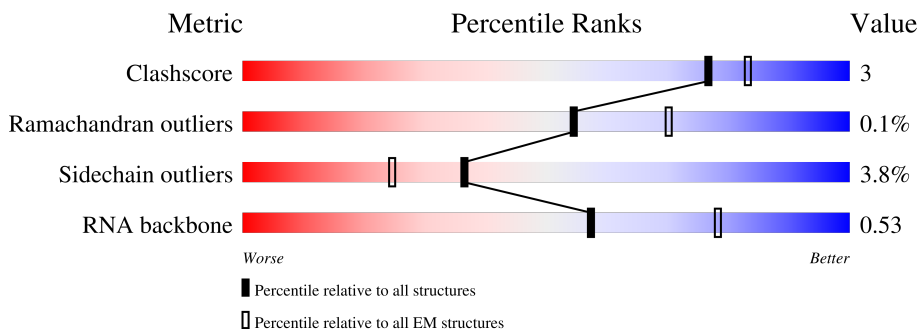
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

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 4.40 Å.

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





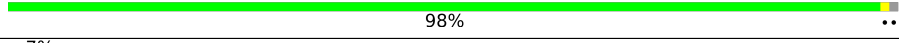
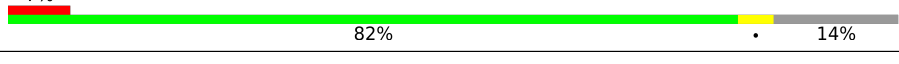
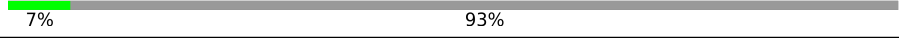
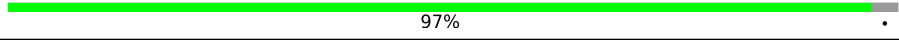


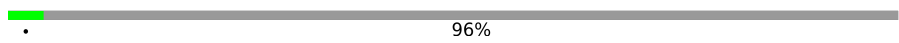



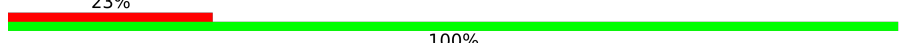

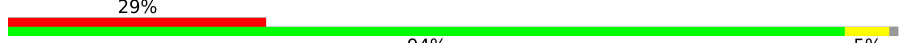

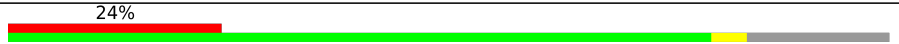




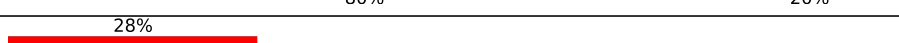
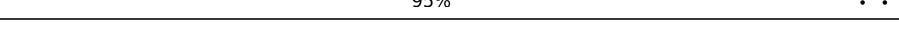
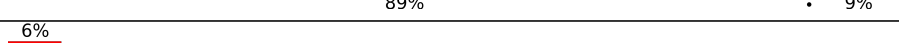
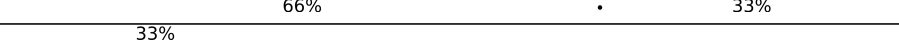
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	2335	94% (Green), 5% (Grey)
2	B	2136	79% (Green), 20% (Grey), 1% (Red), 1% (Orange)
3	2	188	36% (Green), 14% (Yellow), 48% (Grey), 26% (Red)
4	4	144	55% (Green), 28% (Yellow), 6% (Orange), 11% (Grey)
5	5	117	44% (Green), 40% (Yellow), 10% (Orange), 6% (Grey)
6	6	106	42% (Green), 18% (Yellow), 39% (Grey)
7	7	793	29% (Green), 16% (Red), 71% (Grey)

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Mol	Chain	Length	Quality of chain
8	8	464	
9	C	972	
10	D	142	
11	E	357	
12	G	820	
13	M	128	
14	U	565	
15	W	177	
16	Z	347	
17	z	13	
18	66	80	
19	67	103	
20	62	95	
21	63	102	
22	68	96	
23	64	139	
24	65	91	
25	B4	424	
26	9	501	
27	B2	895	
28	B5	86	
29	B3	1217	
30	BP	110	
31	B1	1304	
32	B6	125	




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Mol	Chain	Length	Quality of chain
33	22	118	81% 81% 19%
33	42	118	76% 22%
33	52	118	51% 31% 17%
34	2B	225	41% 40% 59%
35	2f	86	84% 84% 16%
35	4f	86	84% 16%
35	5f	86	84% 15%
36	2b	240	28% 34% 66%
36	4b	240	33% 67%
36	5b	240	30% 70%
37	23	126	61% 64% 34%
37	43	126	15% 61% 34%
37	53	126	54% 13% 33%
38	2g	76	96% 96%
38	4g	76	41% 97%
38	5g	76	72% 25%
39	2e	92	88% 88% 12%
39	4e	92	29% 83% 17%
39	5e	92	84% 16%
40	21	119	56% 67% 33%
40	41	119	68% 32%
40	51	119	38% 26% 32%
41	2A	255	64% 64% 36%
42	F	522	75% 21%
43	J	683	32% 67%

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Mol	Chain	Length	Quality of chain
44	L	499	 74% 25%
45	N	941	 87% 11%
46	S	800	 18% 82%

2 Entry composition

There are 46 unique types of molecules in this entry. The entry contains 80460 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 Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	A	2218	10977	6541	2218	2218	0	0

- Molecule 2 is a protein called U5 small nuclear ribonucleoprotein 200 kDa helicase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	B	1714	8644	5216	1714	1714	0	0

- Molecule 3 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	2	98	2072	926	349	699	98	0	0

- Molecule 4 is a RNA chain called U4 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	4	128	2718	1216	477	898	127	0	0

- Molecule 5 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	5	112	2356	1055	390	799	112	0	0

- Molecule 6 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	6	65	1392	622	253	452	65	0	0

- Molecule 7 is a protein called Splicing factor 3A subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	7	230	1158	698	230	230	0	0

- Molecule 8 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	8	144	729	441	144	144	0	0

- Molecule 9 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	C	836	4223	2551	836	836	0	0

- Molecule 10 is a protein called Thioredoxin-like protein 4A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	D	141	708	426	141	141	0	0

- Molecule 11 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	E	307	1531	917	307	307	0	0

- Molecule 12 is a protein called Probable ATP-dependent RNA helicase DDX23.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	G	57	283	169	57	57	0	0

- Molecule 13 is a protein called NHP2-like protein 1, N-terminally processed.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	M	124	627	379	124	124	0	0

- Molecule 14 is a protein called Ubiquitin carboxyl-terminal hydrolase 39.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	U	456	2308	1396	456	456	0	0

- Molecule 15 is a protein called Peptidyl-prolyl cis-trans isomerase H.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
15	W	169	844	506	169	169	0	0

- Molecule 16 is a RNA chain called pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
16	Z	15	314	141	51	107	15	0	0

- Molecule 17 is a RNA chain called 5'ss oligo.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
17	z	13	286	127	57	89	13	0	0

- Molecule 18 is a protein called U6 snRNA-associated Sm-like protein LSm6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
18	66	72	357	213	72	72	0	0

- Molecule 19 is a protein called U6 snRNA-associated Sm-like protein LSm7.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
19	67	77	384	230	77	77	0	0

- Molecule 20 is a protein called U6 snRNA-associated Sm-like protein LSm2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
20	62	95	478	288	95	95	0	0

- Molecule 21 is a protein called U6 snRNA-associated Sm-like protein LSm3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
21	63	85	429	259	85	85	0	0

- Molecule 22 is a protein called U6 snRNA-associated Sm-like protein LSm8.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
22	68	95	469	279	95	95	0	0

- Molecule 23 is a protein called U6 snRNA-associated Sm-like protein LSm4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
23	64	73	369	223	73	73	0	0

- Molecule 24 is a protein called U6 snRNA-associated Sm-like protein LSm5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	65	76	378	226	76	76	0	0

- Molecule 25 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
25	B4	78	391	235	78	78	0	0

- Molecule 26 is a protein called Splicing factor 3A subunit 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
26	9	383	1920	1154	383	383	0	0

- Molecule 27 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
27	B2	208	1072	656	208	208	0	0

- Molecule 28 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
28	B5	69	347	209	69	69	0	0

- Molecule 29 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
29	B3	1186	5969	3597	1186	1186	0	0

- Molecule 30 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	BP	100	498	298	100	100	0	0

- Molecule 31 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	B1	870	4383	2643	870	870	0	0

- Molecule 32 is a protein called Splicing factor 3B subunit 6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	B6	90	455	275	90	90	0	0

- Molecule 33 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	22	95	482	292	95	95	0	0	
33	42	92	463	279	92	92	0	0	
33	52	98	796	498	144	148	6	0	

- Molecule 34 is a protein called U2 small nuclear ribonucleoprotein B''.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
34	2B	92	461	277	92	92	0	0

- Molecule 35 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	2f	72	Total	C	N	O			
			359	215	72	72	0	0	
35	4f	72	Total	C	N	O			
			359	215	72	72	0	0	
35	5f	73	Total	C	N	O	S		
			567	367	94	101	5	0	

- Molecule 36 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	2b	82	Total	C	N	O			
			413	249	82	82	0	0	
36	4b	79	Total	C	N	O			
			396	238	79	79	0	0	
36	5b	73	Total	C	N	O	S		
			594	376	108	103	7	0	

- Molecule 37 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	23	83	Total	C	N	O			
			415	249	83	83	0	0	
37	43	83	Total	C	N	O			
			415	249	83	83	0	0	
37	53	84	Total	C	N	O	S		
			657	412	116	123	6	0	

- Molecule 38 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	2g	73	Total	C	N	O			
			364	218	73	73	0	0	
38	4g	74	Total	C	N	O			
			369	221	74	74	0	0	
38	5g	74	Total	C	N	O	S		
			577	364	104	103	6	0	

- Molecule 39 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms				AltConf	Trace	
39	2e	81	Total	C	N	O	0	0	
			403	241	81	81			
39	4e	76	Total	C	N	O	0	0	
			378	226	76	76			
39	5e	77	Total	C	N	O	S	0	0
			638	405	113	115	5		

- Molecule 40 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms				AltConf	Trace	
40	21	80	Total	C	N	O	0	0	
			402	242	80	80			
40	41	81	Total	C	N	O	0	0	
			407	245	81	81			
40	51	81	Total	C	N	O	S	0	0
			641	408	112	118	3		

- Molecule 41 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	2A	162	Total	C	N	O	0	0
			816	492	162	162		

- Molecule 42 is a protein called U4/U6 small nuclear ribonucleoprotein Prp4.

Mol	Chain	Residues	Atoms				AltConf	Trace
42	F	412	Total	C	N	O	0	0
			2060	1236	412	412		

- Molecule 43 is a protein called U4/U6 small nuclear ribonucleoprotein Prp3.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	J	224	Total	C	N	O	0	0
			1121	673	224	224		

- Molecule 44 is a protein called U4/U6 small nuclear ribonucleoprotein Prp31.

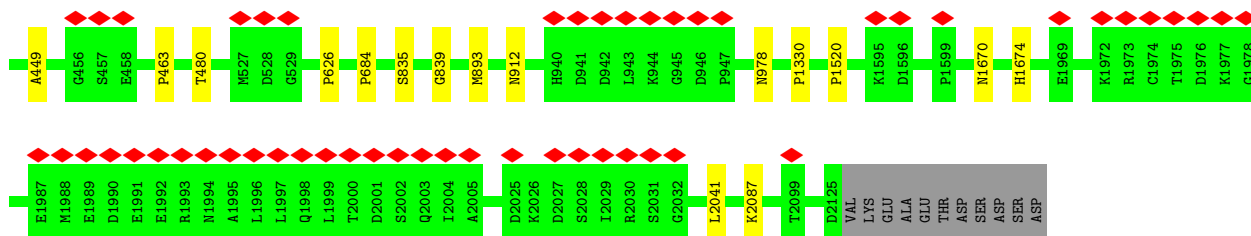
Mol	Chain	Residues	Atoms				AltConf	Trace
44	L	376	Total	C	N	O	0	0
			1887	1135	376	376		

- Molecule 45 is a protein called Pre-mRNA-processing factor 6.

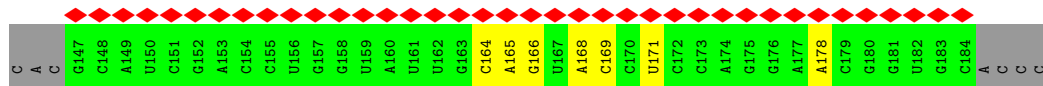
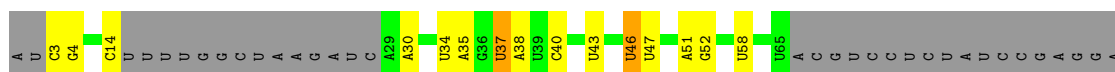
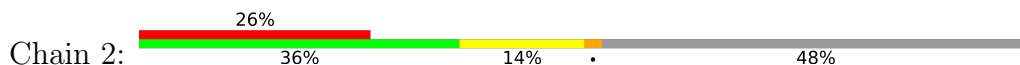
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
45	N	834	4207	2539	834	834	0	0

- Molecule 46 is a protein called U4/U6.U5 tri-snRNP-associated protein 1.

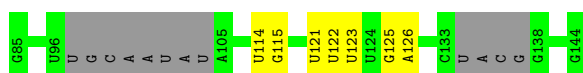
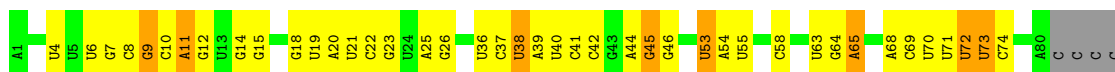
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
46	S	148	744	448	148	148	0	0



• Molecule 3: U2 snRNA



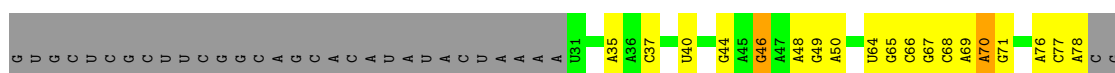
• Molecule 4: U4 snRNA

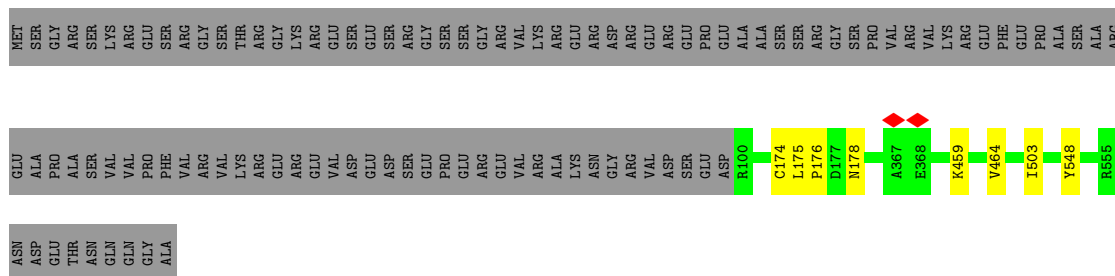


• Molecule 5: U5 snRNA



• Molecule 6: U6 snRNA

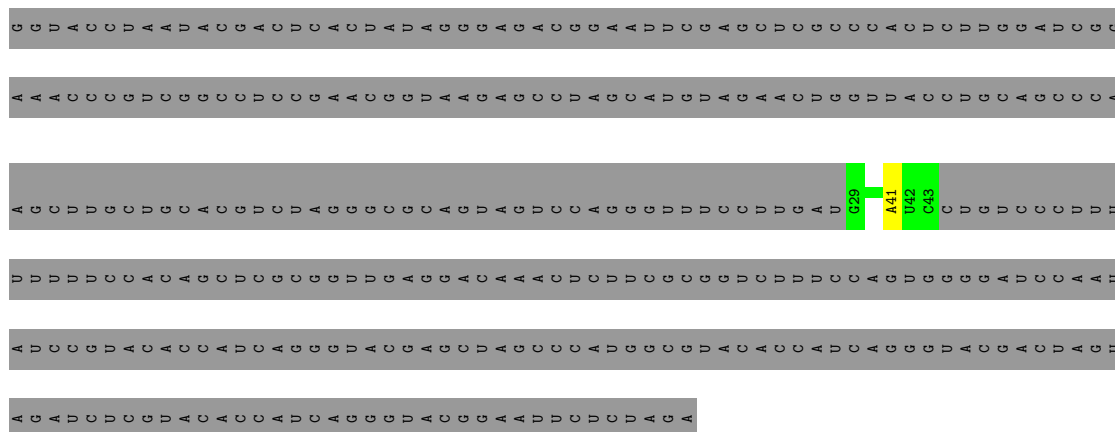




● Molecule 15: Peptidyl-prolyl cis-trans isomerase H



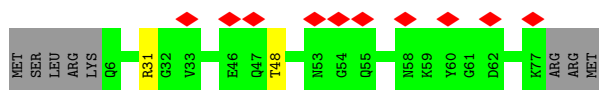
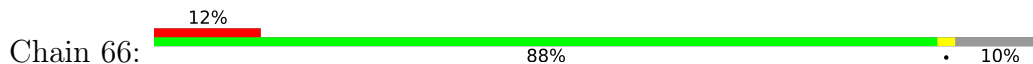
● Molecule 16: pre-mRNA



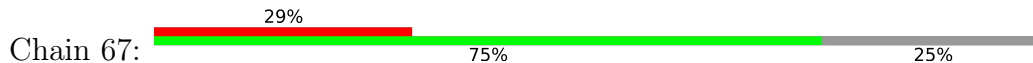
● Molecule 17: 5'ss oligo

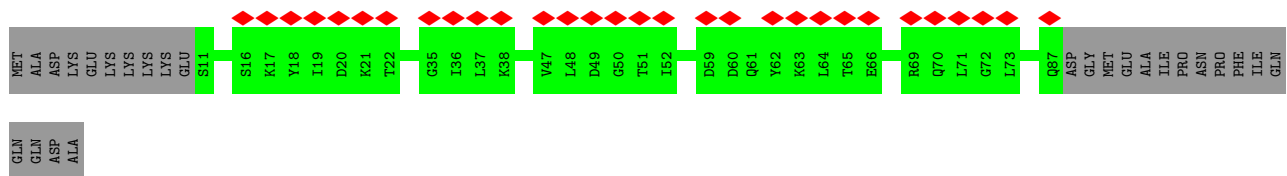


● Molecule 18: U6 snRNA-associated Sm-like protein LSm6

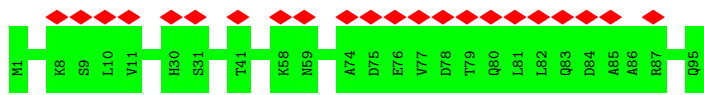


● Molecule 19: U6 snRNA-associated Sm-like protein LSm7

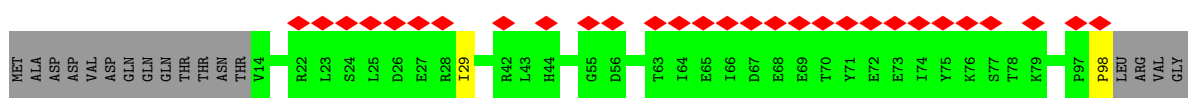
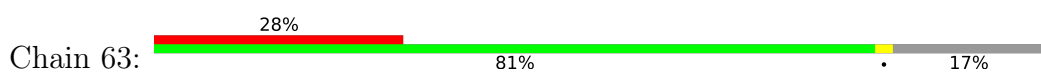




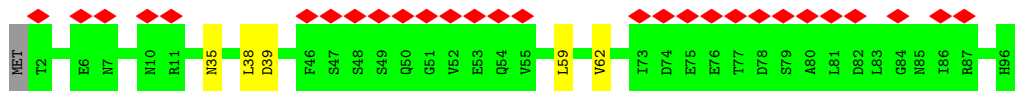
• Molecule 20: U6 snRNA-associated Sm-like protein LSm2



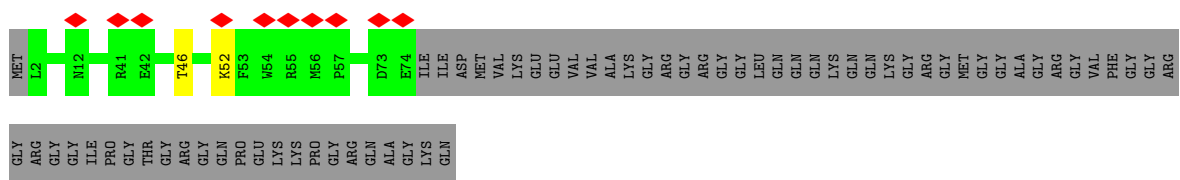
• Molecule 21: U6 snRNA-associated Sm-like protein LSm3



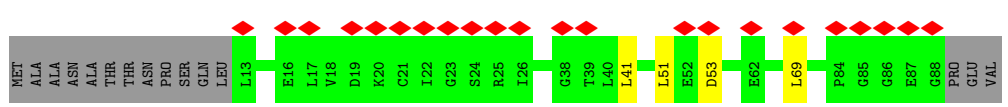
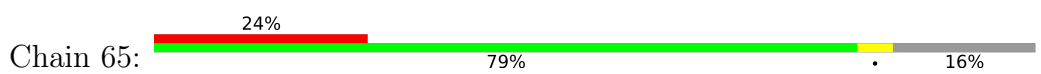
• Molecule 22: U6 snRNA-associated Sm-like protein LSm8



• Molecule 23: U6 snRNA-associated Sm-like protein LSm4

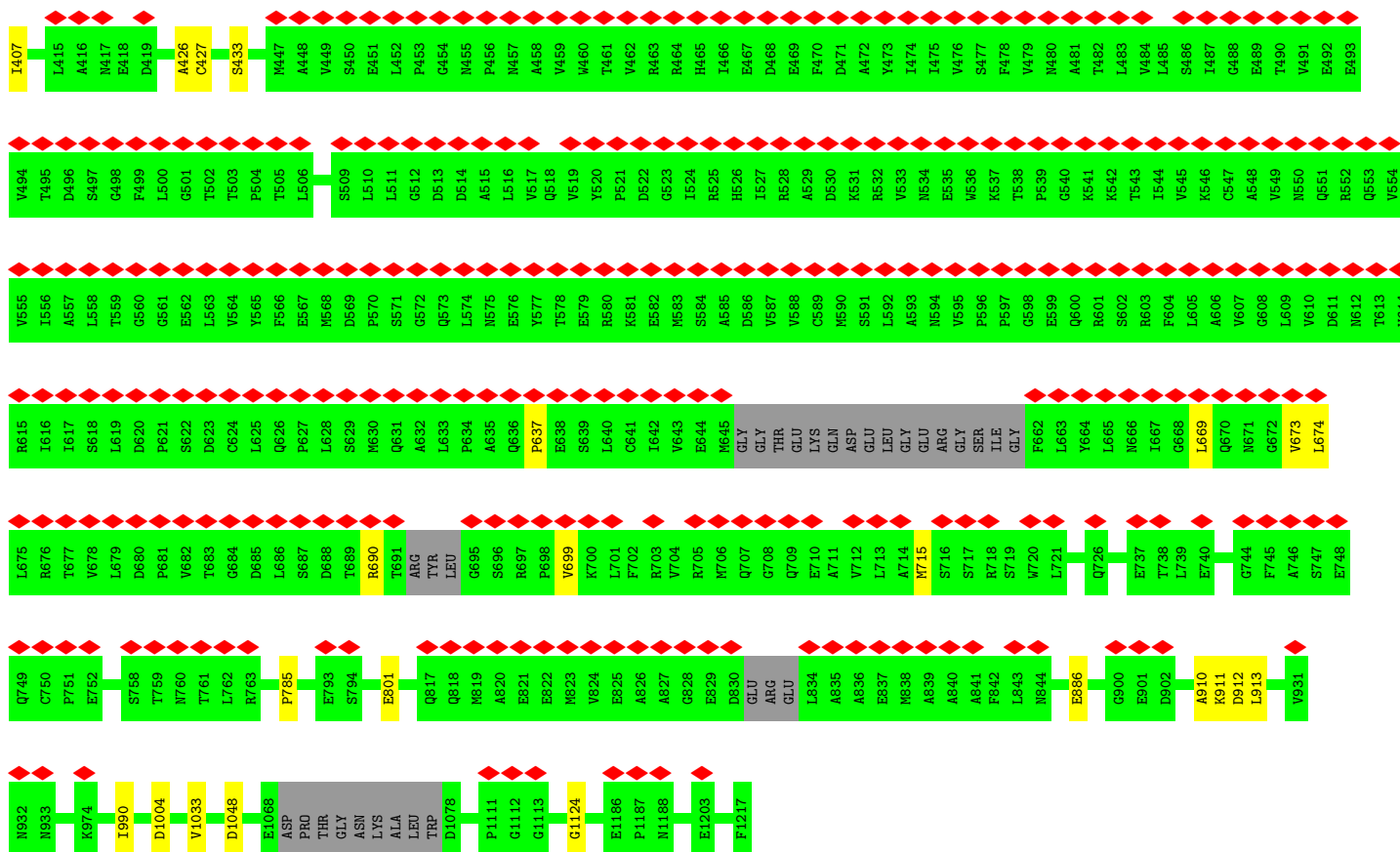


• Molecule 24: U6 snRNA-associated Sm-like protein LSm5



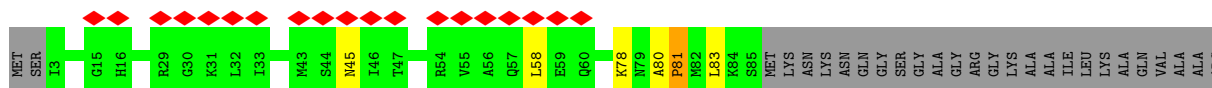
• Molecule 25: Splicing factor 3B subunit 4





GLN
LYS
ARG

• Molecule 37: Small nuclear ribonucleoprotein Sm D3



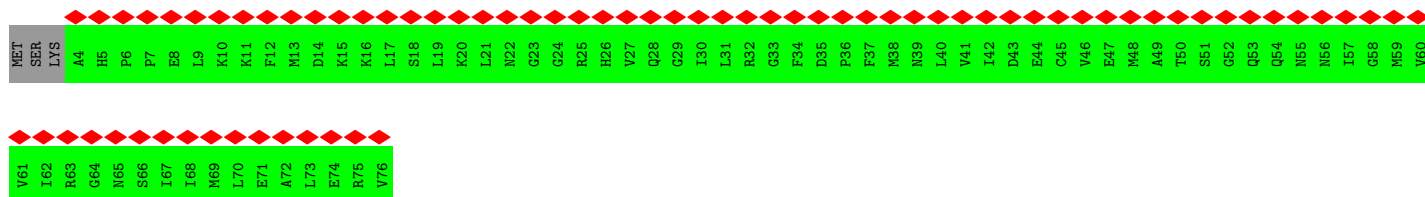
GLY
ARG
GLY
GLY
MET
GLY
ARG
GLY
ASN
ILE
PHE
GLN
LYS
ARG
ARG

• Molecule 37: Small nuclear ribonucleoprotein Sm D3

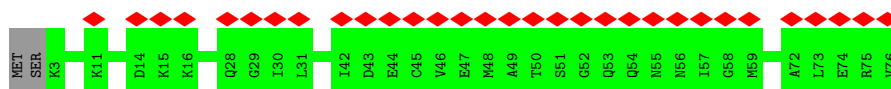
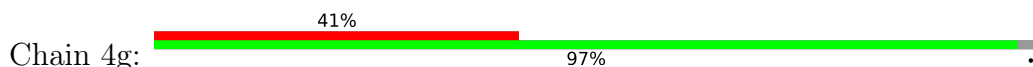


ARG
GLY
ARG
GLY
MET
GLY
ARG
GLY
ASN
ILE
PHE
GLN
LYS
ARG
ARG

• Molecule 38: Small nuclear ribonucleoprotein G



• Molecule 38: Small nuclear ribonucleoprotein G



• Molecule 38: Small nuclear ribonucleoprotein G



• Molecule 39: Small nuclear ribonucleoprotein E

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	94460	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.064	Depositor
Minimum map value	-0.010	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.015	Depositor
Map size (\AA)	556.8, 556.8, 556.8	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.16, 1.16, 1.16	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	0.25	0/11081	0.43	0/15398
2	B	0.25	0/8720	0.42	0/12217
3	2	0.31	0/2308	0.98	9/3584 (0.3%)
4	4	0.21	0/3034	0.71	0/4718
5	5	0.33	0/2625	0.99	19/4079 (0.5%)
6	6	0.21	0/1556	0.73	0/2419
7	7	0.24	0/1164	0.39	0/1625
8	8	0.24	0/734	0.46	0/1025
9	C	0.25	0/4270	0.44	0/5983
10	D	0.25	0/712	0.43	0/995
11	E	0.28	0/1540	0.48	0/2148
12	G	0.24	0/283	0.40	0/393
13	M	0.24	0/632	0.44	0/885
14	U	0.24	0/2330	0.44	0/3268
15	W	0.25	0/853	0.45	0/1188
16	Z	0.25	0/349	0.95	0/540
17	z	0.25	0/321	0.67	0/500
18	66	0.25	0/358	0.45	0/497
19	67	0.24	0/386	0.47	0/537
20	62	0.25	0/480	0.44	0/671
21	63	0.24	0/432	0.47	0/604
22	68	0.24	0/469	0.48	0/651
23	64	0.25	0/372	0.48	0/520
24	65	0.24	0/380	0.48	0/528
25	B4	0.26	0/394	0.44	0/549
26	9	0.24	0/1928	0.39	0/2692
27	B2	0.25	0/1092	0.42	0/1536
28	B5	0.24	0/349	0.36	0/487
29	B3	0.27	0/6024	0.47	0/8425
30	BP	0.24	0/501	0.44	0/697
31	B1	0.25	0/4421	0.41	0/6190
32	B6	0.23	0/459	0.42	0/642
33	22	0.24	0/485	0.43	0/677
33	42	0.24	0/466	0.49	0/651

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	52	0.37	0/805	0.67	1/1081 (0.1%)
34	2B	0.23	0/463	0.42	0/646
35	2f	0.26	0/362	0.49	0/502
35	4f	0.26	0/362	0.49	0/502
35	5f	0.40	0/579	0.79	0/783
36	2b	0.25	0/416	0.46	0/581
36	4b	0.25	0/398	0.49	0/555
36	5b	0.38	0/602	0.57	0/801
37	23	0.26	0/417	0.48	0/581
37	43	0.30	0/417	0.52	0/581
37	53	0.44	0/665	0.56	0/896
38	2g	0.25	0/366	0.48	0/509
38	4g	0.23	0/371	0.47	0/516
38	5g	0.40	0/584	0.72	1/779 (0.1%)
39	2e	0.24	0/403	0.44	0/561
39	4e	0.24	0/378	0.47	0/526
39	5e	0.37	0/646	0.70	0/867
40	21	0.23	0/404	0.47	0/564
40	41	0.23	0/409	0.48	0/571
40	51	0.40	0/649	0.73	1/878 (0.1%)
41	2A	0.25	0/821	0.45	0/1149
42	F	0.28	0/2074	0.45	0/2894
43	J	0.35	0/1127	0.46	0/1572
44	L	0.24	0/1899	0.39	0/2654
45	N	0.27	0/4239	0.40	0/5936
46	S	0.24	0/744	0.40	0/1032
All	All	0.27	0/82108	0.53	31/116036 (0.0%)

There are no bond length outliers.

The worst 5 of 31 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	115	C	C2-N1-C1'	9.64	129.41	118.80
5	5	90	U	N1-C2-O2	8.57	128.80	122.80
5	5	90	U	N3-C2-O2	-7.74	116.78	122.20
5	5	110	C	C5-C6-N1	7.62	124.81	121.00
5	5	90	U	C2-N1-C1'	7.48	126.67	117.70

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	10977	0	5122	13	0
2	B	8644	0	4199	11	0
3	2	2072	0	1049	7	0
4	4	2718	0	1378	19	0
5	5	2356	0	1194	23	0
6	6	1392	0	702	24	0
7	7	1158	0	558	0	0
8	8	729	0	356	2	0
9	C	4223	0	2099	16	0
10	D	708	0	328	1	0
11	E	1531	0	747	10	0
12	G	283	0	128	0	0
13	M	627	0	315	0	0
14	U	2308	0	1104	6	0
15	W	844	0	426	16	0
16	Z	314	0	160	0	0
17	z	286	0	142	0	0
18	66	357	0	169	1	0
19	67	384	0	178	0	0
20	62	478	0	222	0	0
21	63	429	0	199	1	0
22	68	469	0	220	3	0
23	64	369	0	172	1	0
24	65	378	0	174	2	0
25	B4	391	0	197	0	0
26	9	1920	0	902	2	0
27	B2	1072	0	563	0	0
28	B5	347	0	171	0	0
29	B3	5969	0	2985	19	0
30	BP	498	0	241	1	0
31	B1	4383	0	2195	12	0
32	B6	455	0	227	3	0
33	22	482	0	220	0	0
33	42	463	0	211	1	0
33	52	796	0	821	27	0
34	2B	461	0	218	1	0
35	2f	359	0	179	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
35	4f	359	0	179	0	0
35	5f	567	0	575	0	0
36	2b	413	0	194	0	0
36	4b	396	0	183	0	0
36	5b	594	0	615	0	0
37	23	415	0	198	1	0
37	43	415	0	198	4	0
37	53	657	0	675	12	0
38	2g	364	0	176	0	0
38	4g	369	0	178	0	0
38	5g	577	0	603	0	0
39	2e	403	0	173	0	0
39	4e	378	0	163	0	0
39	5e	638	0	657	0	0
40	21	402	0	184	0	0
40	41	407	0	183	0	0
40	51	641	0	681	15	0
41	2A	816	0	386	0	0
42	F	2060	0	1021	18	0
43	J	1121	0	547	7	0
44	L	1887	0	934	4	0
45	N	4207	0	2161	7	0
46	S	744	0	360	0	0
All	All	80460	0	41695	256	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 3.

The worst 5 of 256 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)
11:E:53:SER:CB	11:E:56:GLN:CB	2.45	0.94
37:23:48:VAL:O	37:23:55:VAL:HA	1.73	0.89
31:B1:676:GLY:HA2	31:B1:715:ALA:HB1	1.57	0.87
29:B3:886:GLU:HA	29:B3:910:ALA:O	1.75	0.85
31:B1:680:LEU:HA	31:B1:716:ALA:HA	1.58	0.85

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	2212/2335 (95%)	2128 (96%)	84 (4%)	0	100	100
2	B	1710/2136 (80%)	1689 (99%)	21 (1%)	0	100	100
7	7	224/793 (28%)	219 (98%)	5 (2%)	0	100	100
8	8	138/464 (30%)	134 (97%)	4 (3%)	0	100	100
9	C	834/972 (86%)	817 (98%)	17 (2%)	0	100	100
10	D	139/142 (98%)	138 (99%)	1 (1%)	0	100	100
11	E	305/357 (85%)	302 (99%)	3 (1%)	0	100	100
12	G	55/820 (7%)	53 (96%)	2 (4%)	0	100	100
13	M	122/128 (95%)	114 (93%)	8 (7%)	0	100	100
14	U	454/565 (80%)	441 (97%)	13 (3%)	0	100	100
15	W	167/177 (94%)	166 (99%)	1 (1%)	0	100	100
18	66	70/80 (88%)	70 (100%)	0	0	100	100
19	67	75/103 (73%)	74 (99%)	1 (1%)	0	100	100
20	62	93/95 (98%)	91 (98%)	2 (2%)	0	100	100
21	63	83/102 (81%)	82 (99%)	1 (1%)	0	100	100
22	68	93/96 (97%)	92 (99%)	1 (1%)	0	100	100
23	64	71/139 (51%)	70 (99%)	1 (1%)	0	100	100
24	65	74/91 (81%)	72 (97%)	2 (3%)	0	100	100
25	B4	76/424 (18%)	76 (100%)	0	0	100	100
26	9	377/501 (75%)	369 (98%)	8 (2%)	0	100	100
27	B2	204/895 (23%)	200 (98%)	4 (2%)	0	100	100
28	B5	67/86 (78%)	66 (98%)	1 (2%)	0	100	100
29	B3	1176/1217 (97%)	1137 (97%)	38 (3%)	1 (0%)	51	85
30	BP	98/110 (89%)	96 (98%)	2 (2%)	0	100	100
31	B1	866/1304 (66%)	843 (97%)	21 (2%)	2 (0%)	47	81

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
32	B6	88/125 (70%)	85 (97%)	3 (3%)	0	100	100
33	22	91/118 (77%)	91 (100%)	0	0	100	100
33	42	90/118 (76%)	89 (99%)	1 (1%)	0	100	100
33	52	94/118 (80%)	88 (94%)	6 (6%)	0	100	100
34	2B	90/225 (40%)	90 (100%)	0	0	100	100
35	2f	70/86 (81%)	69 (99%)	1 (1%)	0	100	100
35	4f	70/86 (81%)	68 (97%)	2 (3%)	0	100	100
35	5f	71/86 (83%)	62 (87%)	9 (13%)	0	100	100
36	2b	80/240 (33%)	80 (100%)	0	0	100	100
36	4b	77/240 (32%)	76 (99%)	1 (1%)	0	100	100
36	5b	69/240 (29%)	65 (94%)	4 (6%)	0	100	100
37	23	81/126 (64%)	79 (98%)	2 (2%)	0	100	100
37	43	81/126 (64%)	78 (96%)	1 (1%)	2 (2%)	5	35
37	53	82/126 (65%)	77 (94%)	5 (6%)	0	100	100
38	2g	71/76 (93%)	71 (100%)	0	0	100	100
38	4g	72/76 (95%)	70 (97%)	2 (3%)	0	100	100
38	5g	72/76 (95%)	66 (92%)	6 (8%)	0	100	100
39	2e	79/92 (86%)	79 (100%)	0	0	100	100
39	4e	74/92 (80%)	73 (99%)	1 (1%)	0	100	100
39	5e	75/92 (82%)	72 (96%)	3 (4%)	0	100	100
40	21	78/119 (66%)	76 (97%)	2 (3%)	0	100	100
40	41	79/119 (66%)	77 (98%)	2 (2%)	0	100	100
40	51	79/119 (66%)	75 (95%)	4 (5%)	0	100	100
41	2A	160/255 (63%)	158 (99%)	2 (1%)	0	100	100
42	F	408/522 (78%)	398 (98%)	6 (2%)	4 (1%)	15	54
43	J	220/683 (32%)	216 (98%)	3 (1%)	1 (0%)	29	68
44	L	372/499 (74%)	366 (98%)	6 (2%)	0	100	100
45	N	826/941 (88%)	786 (95%)	38 (5%)	2 (0%)	47	81
46	S	138/800 (17%)	136 (99%)	2 (1%)	0	100	100
All	All	13720/20753 (66%)	13355 (97%)	353 (3%)	12 (0%)	54	85

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
37	43	78	LYS
42	F	480	PRO
42	F	261	PRO
31	B1	726	SER
37	43	81	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	107/2108 (5%)	107 (100%)	0	100	100
2	B	78/1908 (4%)	78 (100%)	0	100	100
7	7	9/709 (1%)	9 (100%)	0	100	100
8	8	8/382 (2%)	8 (100%)	0	100	100
9	C	48/866 (6%)	48 (100%)	0	100	100
10	D	5/130 (4%)	5 (100%)	0	100	100
11	E	10/300 (3%)	10 (100%)	0	100	100
12	G	1/721 (0%)	1 (100%)	0	100	100
13	M	6/111 (5%)	6 (100%)	0	100	100
14	U	23/511 (4%)	23 (100%)	0	100	100
15	W	10/148 (7%)	10 (100%)	0	100	100
18	66	2/70 (3%)	2 (100%)	0	100	100
19	67	3/91 (3%)	3 (100%)	0	100	100
20	62	3/88 (3%)	3 (100%)	0	100	100
21	63	4/94 (4%)	4 (100%)	0	100	100
22	68	1/82 (1%)	1 (100%)	0	100	100
23	64	4/111 (4%)	4 (100%)	0	100	100
24	65	3/80 (4%)	3 (100%)	0	100	100
25	B4	4/336 (1%)	4 (100%)	0	100	100
26	9	11/446 (2%)	11 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
27	B2	22/776 (3%)	22 (100%)	0	100	100
28	B5	3/77 (4%)	3 (100%)	0	100	100
29	B3	60/1051 (6%)	60 (100%)	0	100	100
30	BP	4/95 (4%)	4 (100%)	0	100	100
31	B1	40/1104 (4%)	40 (100%)	0	100	100
32	B6	5/109 (5%)	5 (100%)	0	100	100
33	22	5/110 (4%)	5 (100%)	0	100	100
33	42	4/110 (4%)	4 (100%)	0	100	100
33	52	93/110 (84%)	92 (99%)	1 (1%)	73	85
34	2B	3/195 (2%)	3 (100%)	0	100	100
35	2f	4/74 (5%)	4 (100%)	0	100	100
35	4f	4/74 (5%)	4 (100%)	0	100	100
35	5f	61/74 (82%)	60 (98%)	1 (2%)	62	79
36	2b	4/177 (2%)	4 (100%)	0	100	100
36	4b	3/177 (2%)	3 (100%)	0	100	100
36	5b	67/177 (38%)	66 (98%)	1 (2%)	65	80
37	23	3/101 (3%)	3 (100%)	0	100	100
37	43	3/101 (3%)	3 (100%)	0	100	100
37	53	73/101 (72%)	73 (100%)	0	100	100
38	2g	3/66 (4%)	3 (100%)	0	100	100
38	4g	3/66 (4%)	3 (100%)	0	100	100
38	5g	64/66 (97%)	46 (72%)	18 (28%)	0	3
39	2e	1/84 (1%)	1 (100%)	0	100	100
39	4e	1/84 (1%)	1 (100%)	0	100	100
39	5e	72/84 (86%)	72 (100%)	0	100	100
40	21	3/101 (3%)	3 (100%)	0	100	100
40	41	3/101 (3%)	3 (100%)	0	100	100
40	51	76/101 (75%)	55 (72%)	21 (28%)	0	3
41	2A	6/218 (3%)	6 (100%)	0	100	100
42	F	16/442 (4%)	16 (100%)	0	100	100
43	J	8/599 (1%)	8 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
44	L	14/424 (3%)	14 (100%)	0	100	100
45	N	36/792 (4%)	36 (100%)	0	100	100
46	S	5/681 (1%)	5 (100%)	0	100	100
All	All	1112/17994 (6%)	1070 (96%)	42 (4%)	36	58

5 of 42 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
38	5g	27	VAL
38	5g	51	SER
38	5g	35	ASP
38	5g	46	VAL
38	5g	62	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
40	51	63	ASN
40	51	64	ASN
38	5g	55	ASN
33	52	41	GLN
38	5g	26	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	Z	14/347 (4%)	1 (7%)	0
17	z	12/13 (92%)	6 (50%)	0
3	2	94/188 (50%)	18 (19%)	4 (4%)
4	4	124/144 (86%)	31 (25%)	1 (0%)
5	5	110/117 (94%)	39 (35%)	4 (3%)
6	6	62/106 (58%)	9 (14%)	1 (1%)
All	All	416/915 (45%)	104 (25%)	10 (2%)

5 of 104 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	2	30	A
3	2	38	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	2	40	C
3	2	43	U
3	2	47	U

5 of 10 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
5	5	96	A
5	5	105	U
6	6	77	C
3	2	106	G
4	4	114	U

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

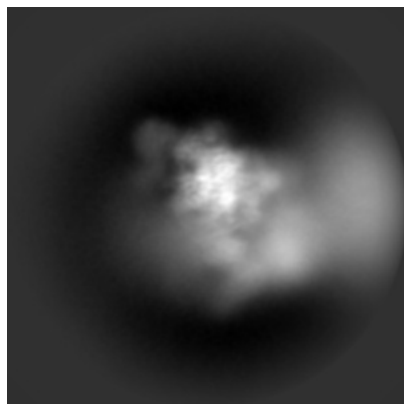
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-18789. These allow visual inspection of the internal detail of the map and identification of artifacts.

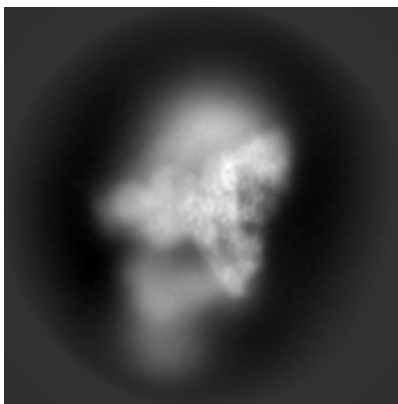
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

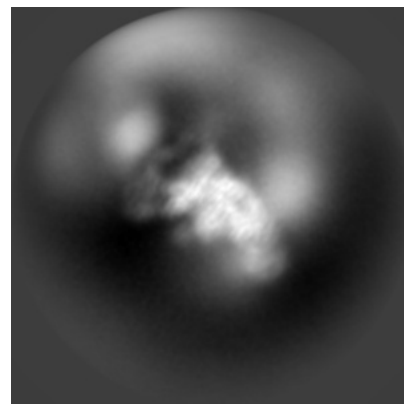
6.1.1 Primary map



X

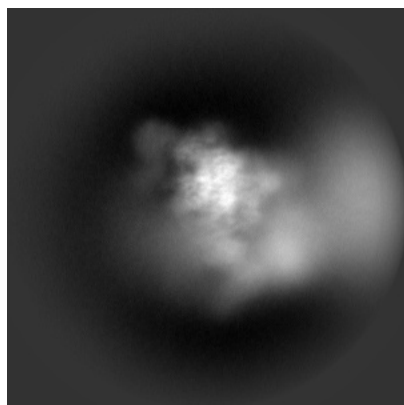


Y

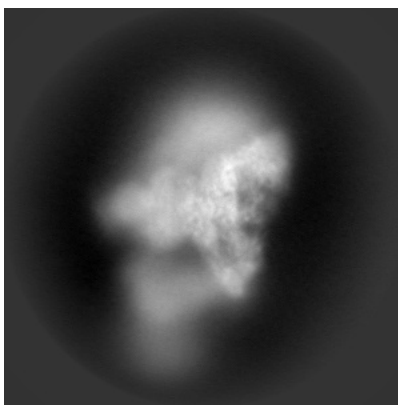


Z

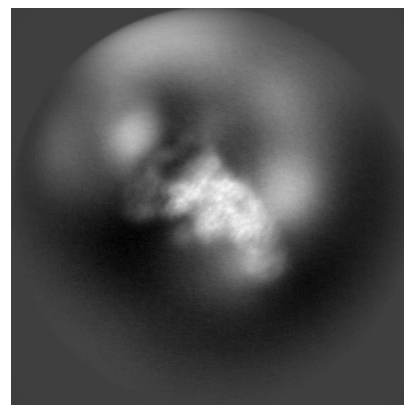
6.1.2 Raw map



X



Y

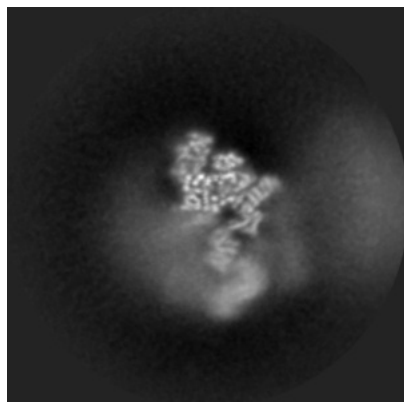


Z

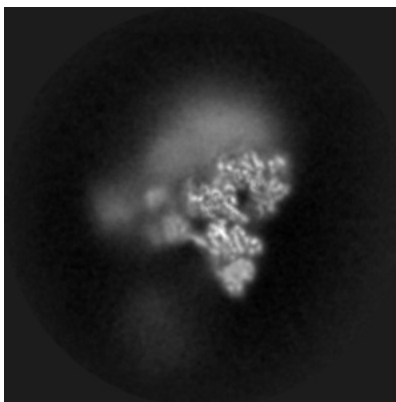
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

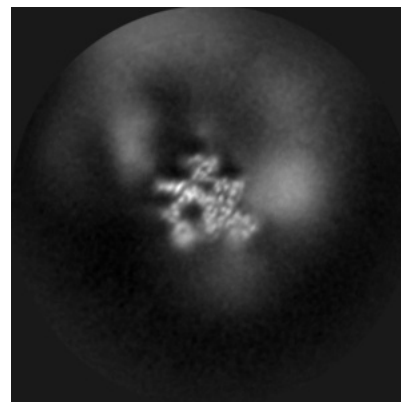
6.2.1 Primary map



X Index: 240

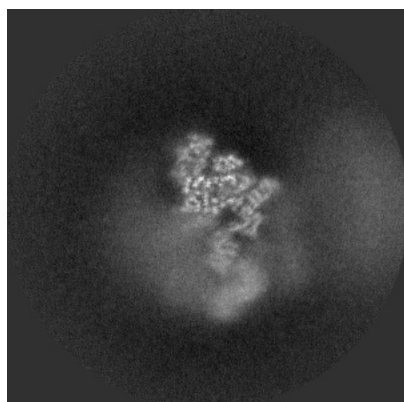


Y Index: 240

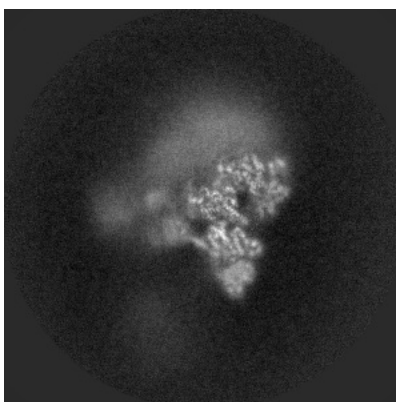


Z Index: 240

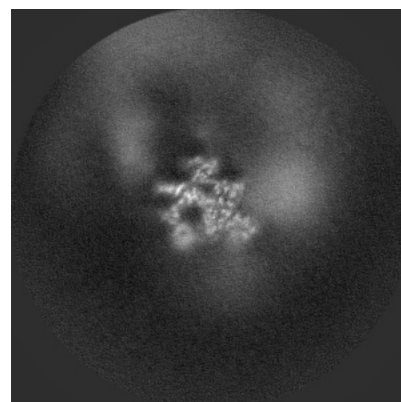
6.2.2 Raw map



X Index: 240



Y Index: 240

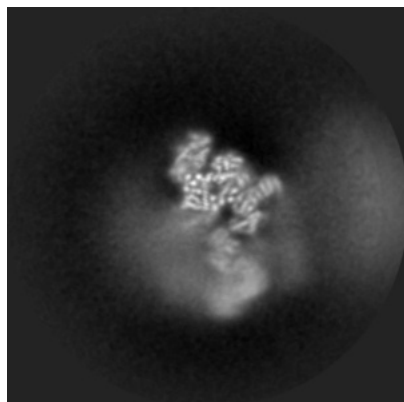


Z Index: 240

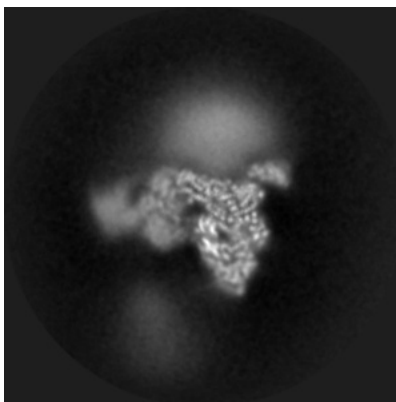
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

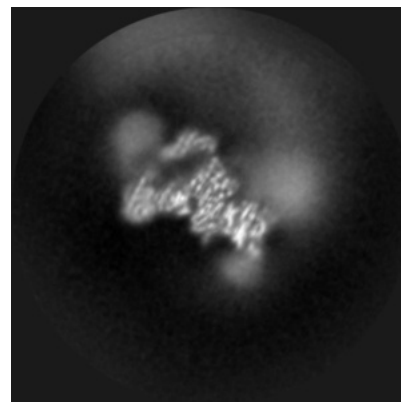
6.3.1 Primary map



X Index: 237

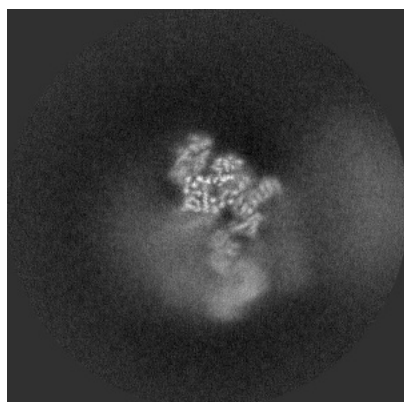


Y Index: 260

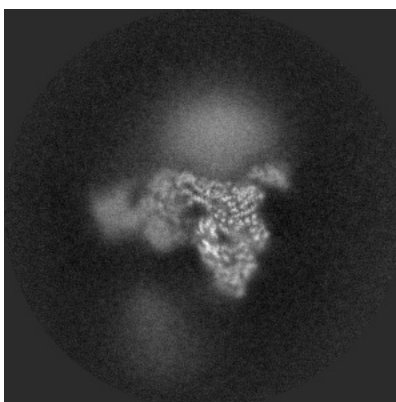


Z Index: 273

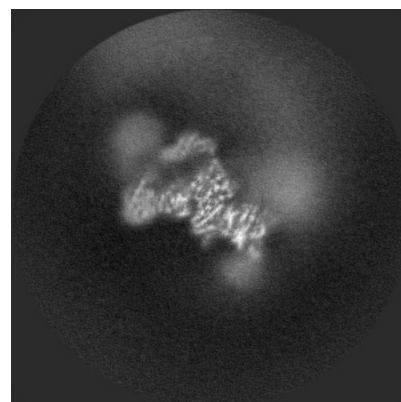
6.3.2 Raw map



X Index: 238



Y Index: 261

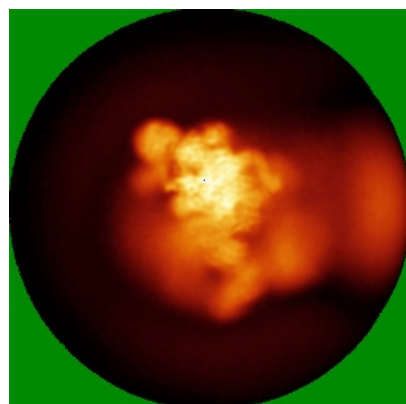


Z Index: 274

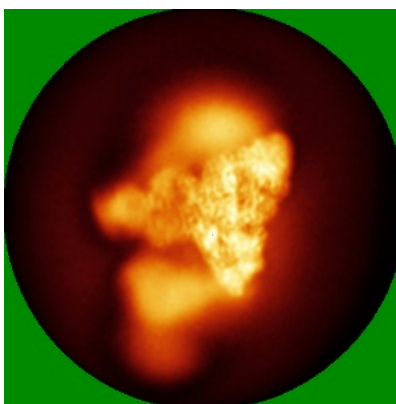
The images above show the largest variance slices of the map in three orthogonal directions.

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

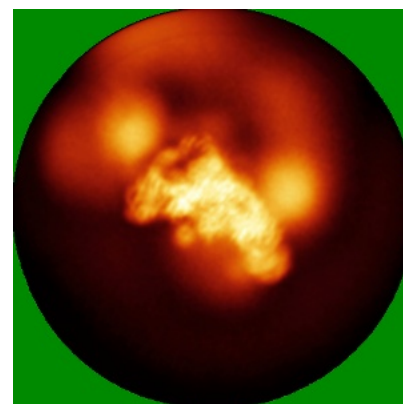
6.4.1 Primary map



X

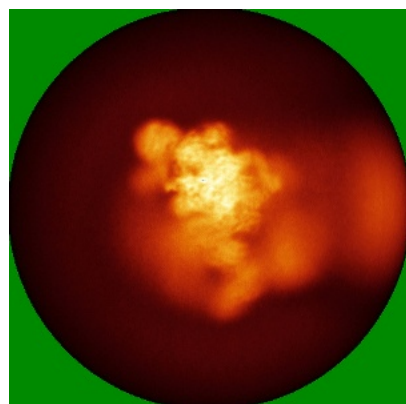


Y

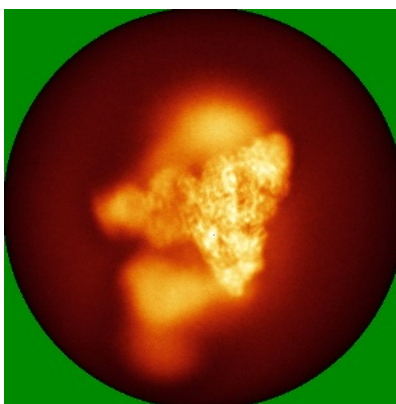


Z

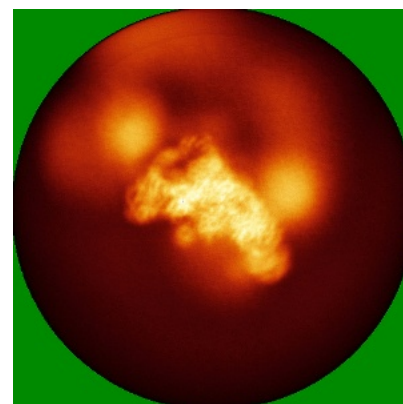
6.4.2 Raw map



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.

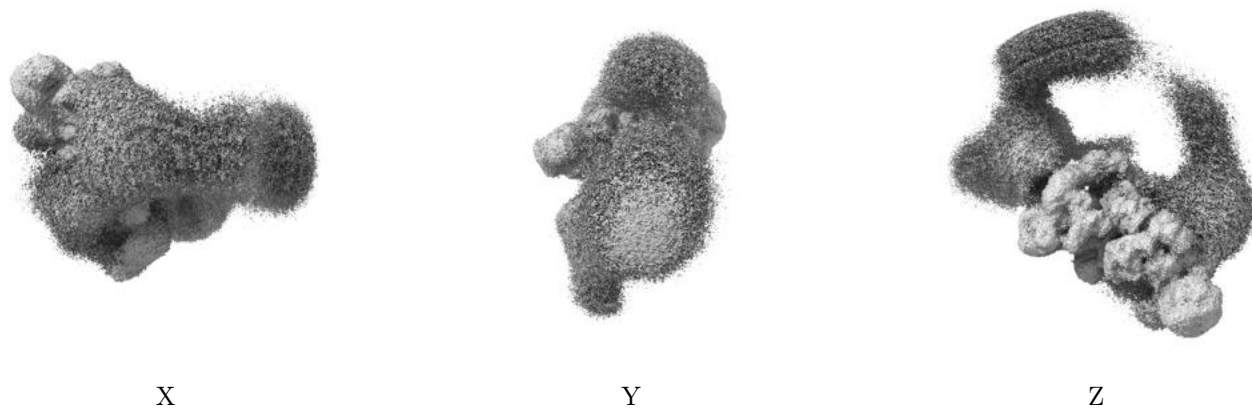
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

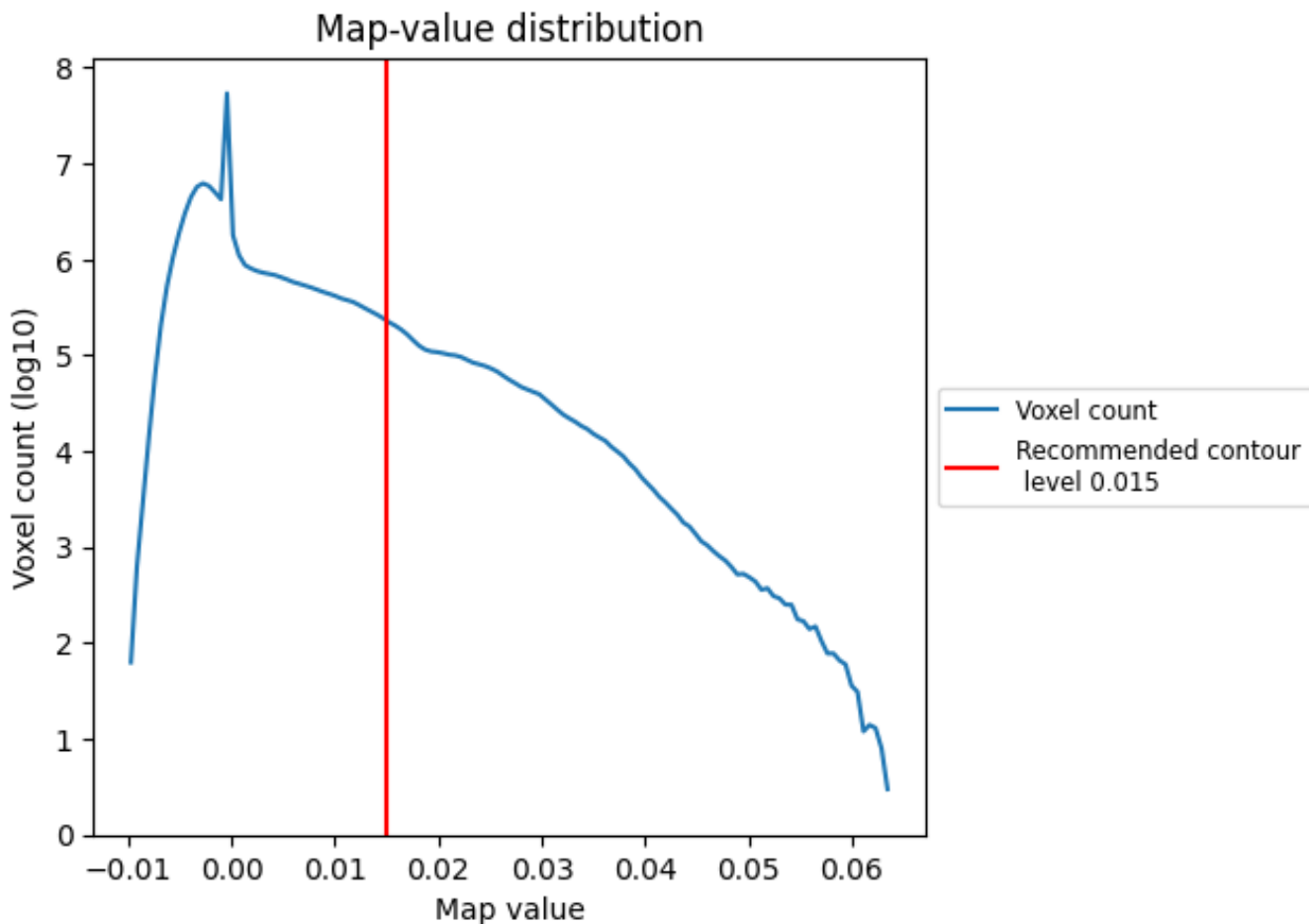
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

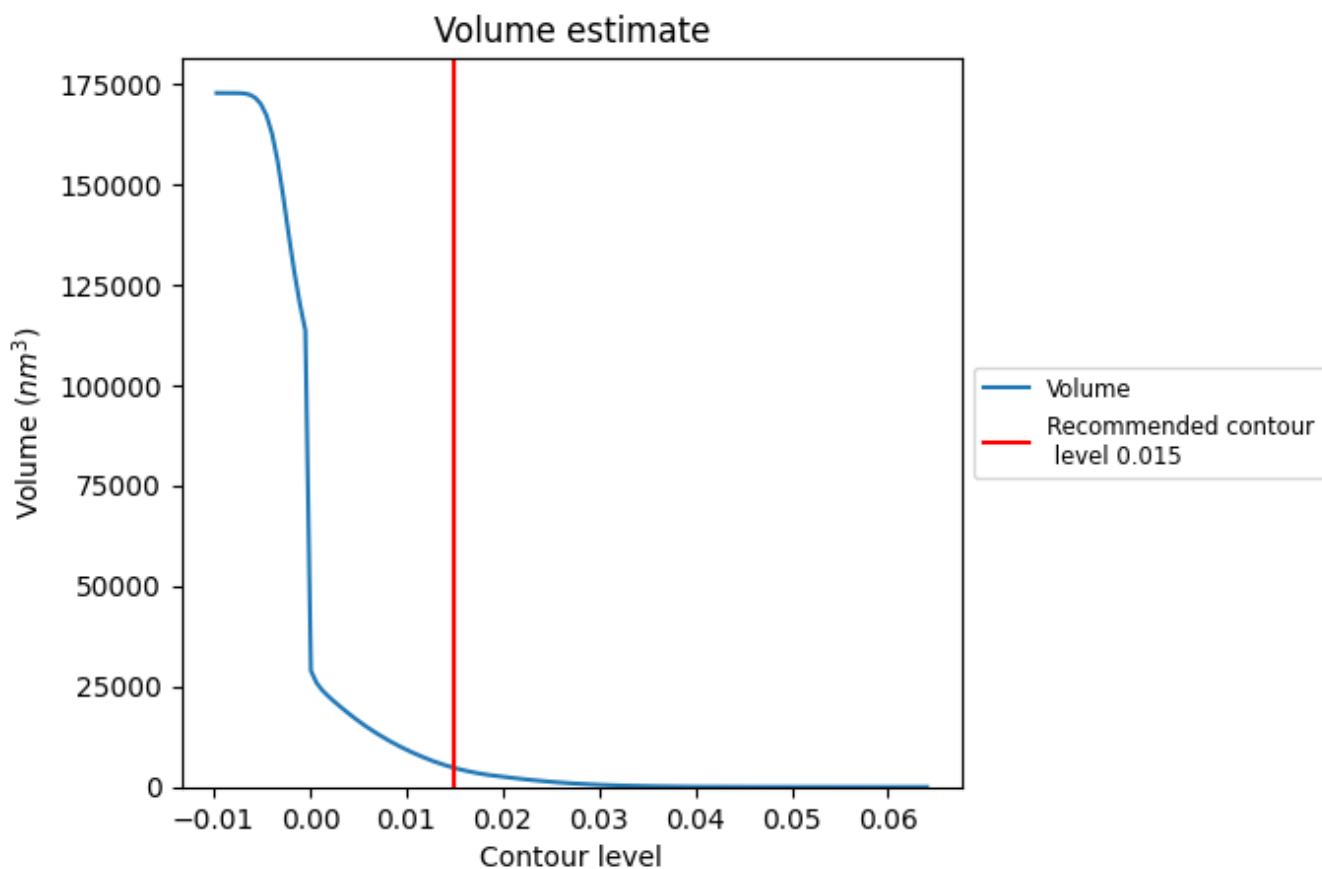
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

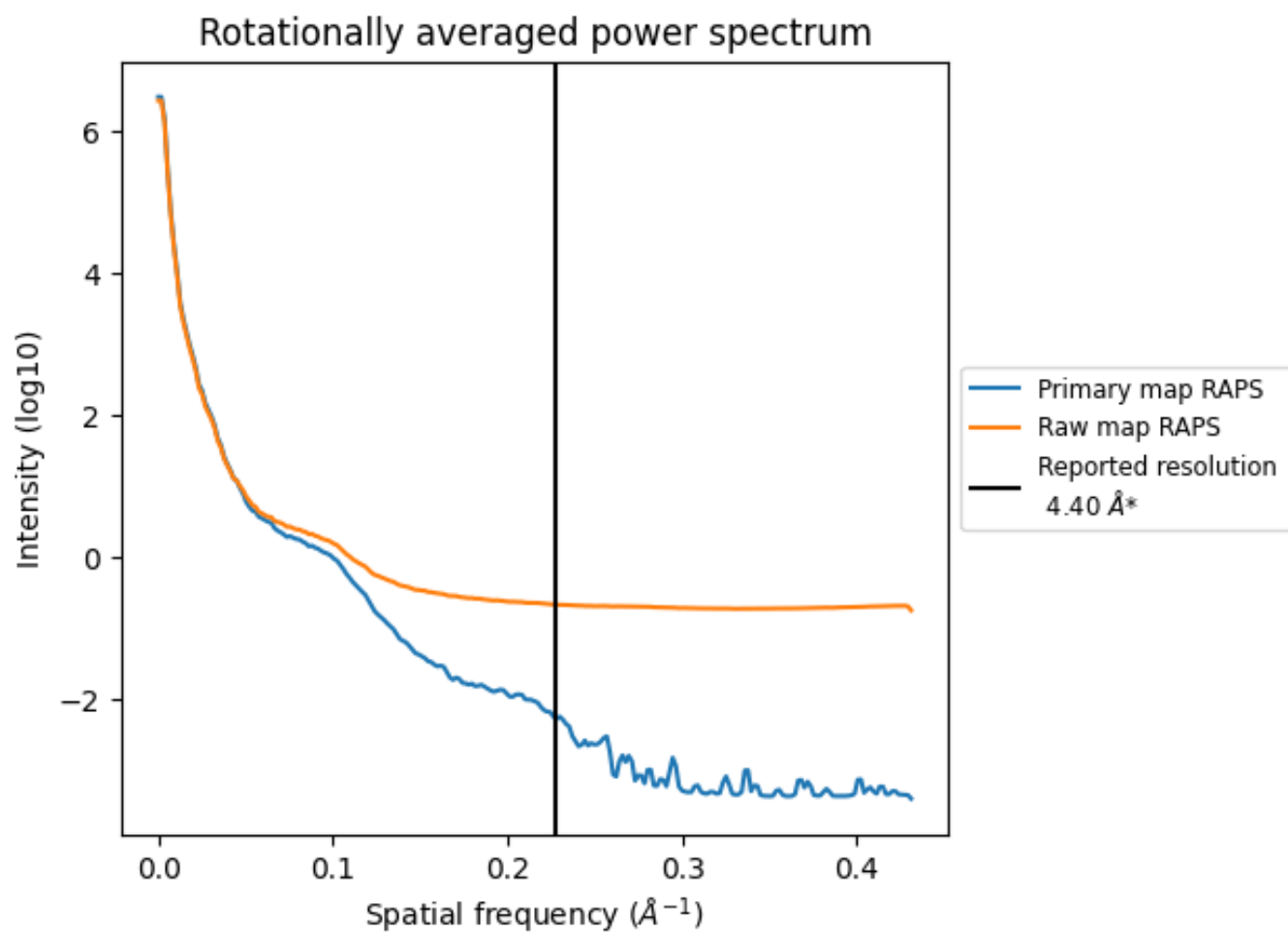
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 4716 nm^3 ; this corresponds to an approximate mass of 4260 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

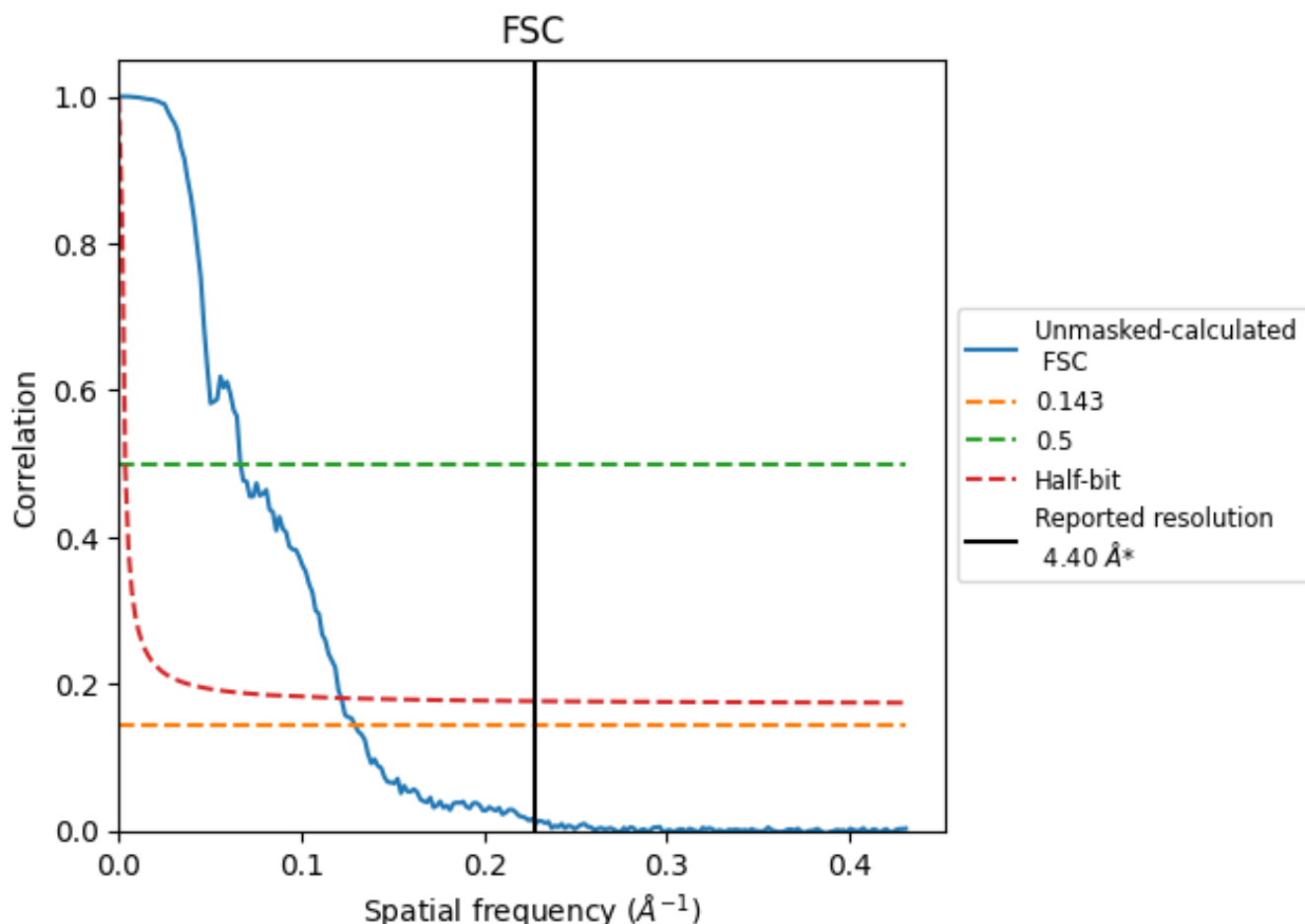


*Reported resolution corresponds to spatial frequency of 0.227 \AA^{-1}

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 0.227 Å⁻¹

8.2 Resolution estimates [i](#)

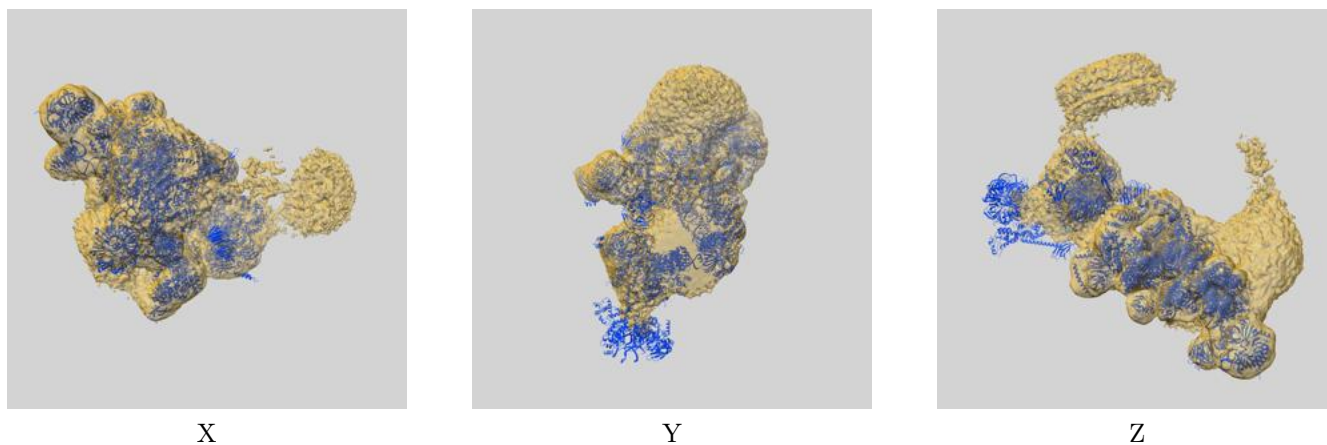
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.73	15.02	8.21

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.73 differs from the reported value 4.4 by more than 10 %

9 Map-model fit [i](#)

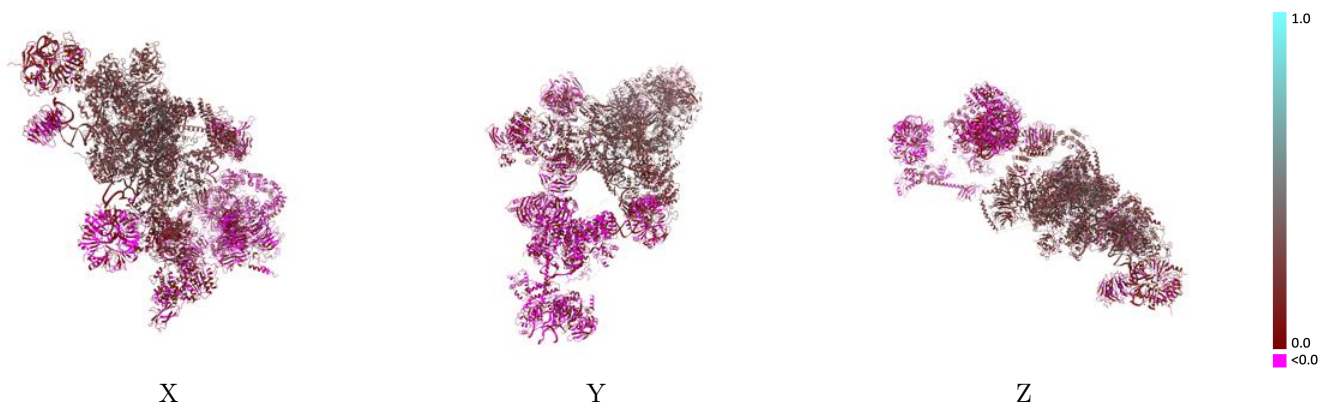
This section contains information regarding the fit between EMDB map EMD-18789 and PDB model 8R0B. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



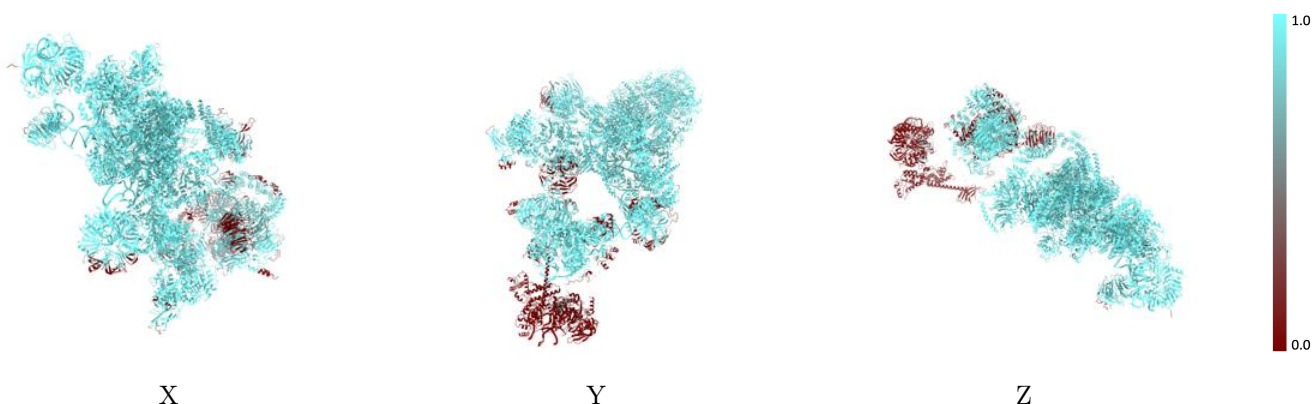
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



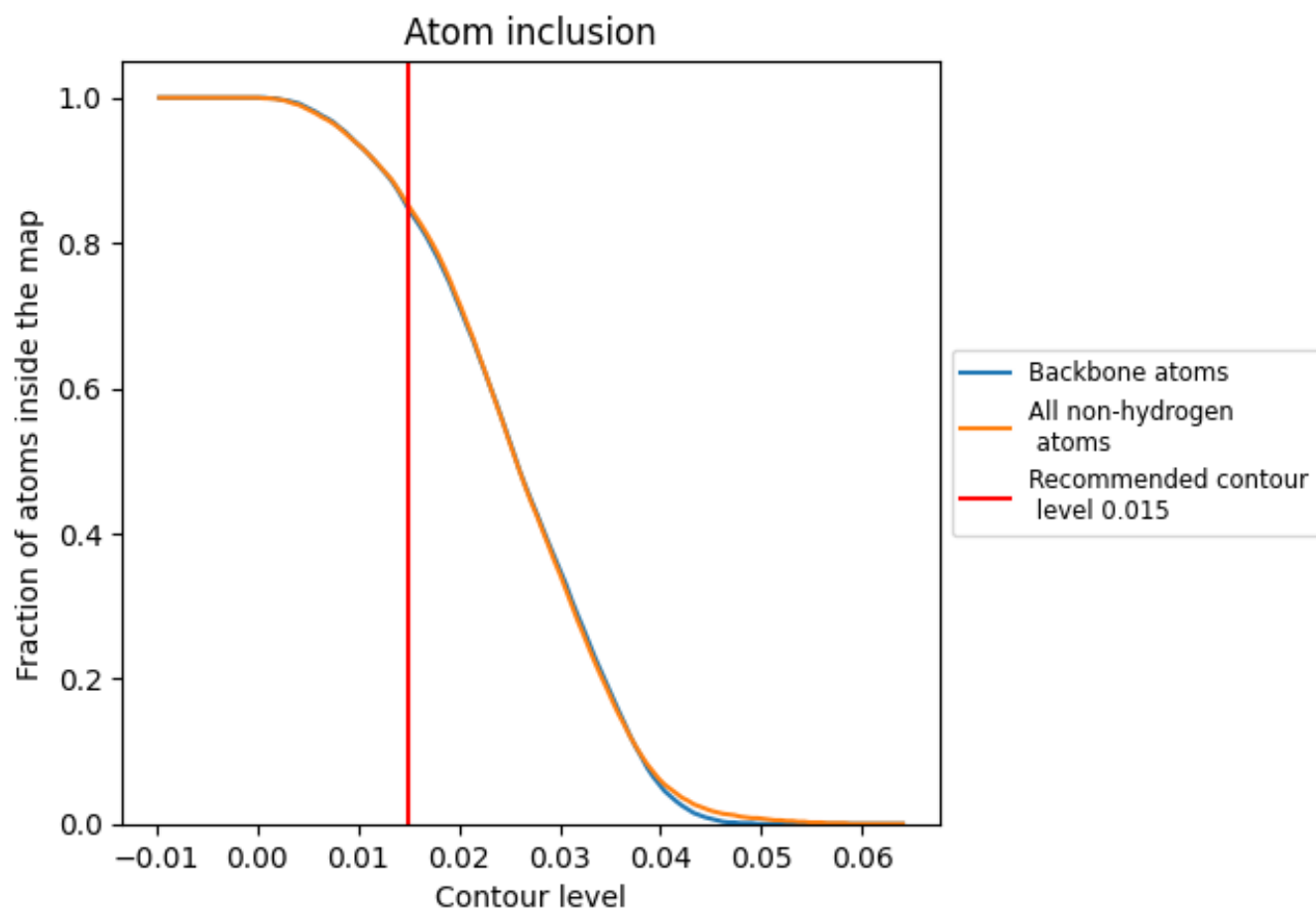
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.015).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 85% 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 (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8510	 0.1480
2	 0.4870	 0.0350
21	 0.1520	 0.0210
22	 0.0000	 -0.0070
23	 0.0870	 0.0350
2A	 0.0030	 0.0010
2B	 0.0000	 -0.0000
2b	 0.1720	 0.0090
2e	 0.0000	 0.0190
2f	 0.0000	 0.0410
2g	 0.0000	 0.0450
4	 1.0000	 0.1420
41	 1.0000	 0.0480
42	 1.0000	 0.0230
43	 0.7830	 -0.0220
4b	 0.9770	 0.0230
4e	 0.6480	 0.0200
4f	 0.9640	 0.0080
4g	 0.5830	 0.0130
5	 0.9960	 0.2080
51	 0.9940	 0.1070
52	 0.9640	 0.0900
53	 1.0000	 0.1530
5b	 0.9930	 0.1280
5e	 1.0000	 0.1100
5f	 0.9980	 0.1010
5g	 0.9930	 0.1010
6	 1.0000	 0.1980
62	 0.7680	 0.0500
63	 0.6570	 0.0290
64	 0.8180	 0.0830
65	 0.7090	 0.0110
66	 0.8740	 0.0430
67	 0.6220	 0.0410
68	 0.7080	 0.0440



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Chain	Atom inclusion	Q-score
7	 0.4540	 0.1390
8	 0.2920	 0.0180
9	 0.1730	 0.0250
A	 0.9990	 0.2920
B	 0.9690	 0.1280
B1	 0.9060	 0.0260
B2	 0.8620	 0.0220
B3	 0.7050	 0.0250
B4	 1.0000	 0.0440
B5	 1.0000	 0.0300
B6	 0.5450	 0.0410
BP	 1.0000	 -0.0030
C	 1.0000	 0.2810
D	 1.0000	 0.3290
E	 0.9090	 0.0360
F	 1.0000	 0.2310
G	 1.0000	 0.1960
J	 1.0000	 0.2600
L	 0.9950	 0.3020
M	 1.0000	 0.2980
N	 0.9910	 0.2350
S	 0.9920	 0.2510
U	 0.9920	 0.2670
W	 0.9960	 0.1610
Z	 1.0000	 0.0360
z	 1.0000	 0.2670