



# wwPDB EM Validation Summary Report ⓘ

Mar 13, 2024 – 01:23 PM JST

PDB ID : 3J3V  
EMDB ID : EMD-5642  
Title : Atomic model of the immature 50S subunit from *Bacillus subtilis* (state I-a)  
Authors : Li, N.; Guo, Q.; Zhang, Y.; Yuan, Y.; Ma, C.; Lei, J.; Gao, N.  
Deposited on : 2013-04-28  
Resolution : 13.30 Å (reported)  
Based on initial models : 2J01, 2AW4

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

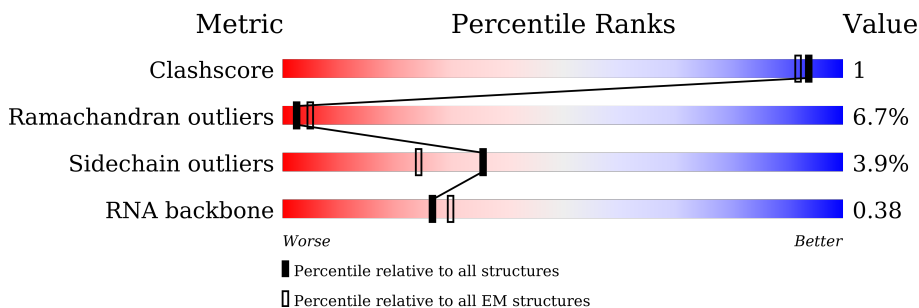
EMDB validation analysis : 0.0.1.dev70  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

# 1 Overall quality at a glance

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

The reported resolution of this entry is 13.30 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  $\geq 3$ , 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	0	59	
2	2	44	
3	5	232	
4	6	141	
5	A	2927	
6	B	119	
7	C	277	

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Mol	Chain	Length	Quality of chain
8	D	209	89% 9% ..
9	E	207	86% 12% .
10	F	179	86% 13% .
11	G	179	87% . 9%
12	J	145	86% 11% ..
13	K	122	93% 7%
14	L	146	85% 12% .
15	N	120	94% 6%
16	O	120	83% 15% .
17	P	115	73% 20% . .
18	Q	119	94% . . .
19	R	102	88% 11% .
20	S	113	93% 5% ..
21	T	95	86% 12% .
22	U	103	84% 15% .
23	X	66	85% 8% 8%
24	Y	59	92% . 5%

## 2 Entry composition [i](#)

There are 24 unique types of molecules in this entry. The entry contains 86157 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 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	55	433	267	87	72	7	0	0

- Molecule 2 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	2	44	368	222	89	55	2	0	0

- Molecule 3 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	5	120	910	576	156	176	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	6	141	1044	657	184	196	7	0	0

- Molecule 5 is a RNA chain called ribosome RNA 23S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	A	2884	61914	27625	11428	19979	2882	0	0

- Molecule 6 is a RNA chain called ribosome RNA 5S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	B	119	2542	1135	462	827	118	0	0

- Molecule 7 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	C	277	2129	1323	419	380	7	0	0

- Molecule 8 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	D	206	1568	984	289	290	5	0	0

- Molecule 9 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	E	206	1567	983	290	292	2	0	0

- Molecule 10 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	F	179	1413	898	246	261	8	0	0

- Molecule 11 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	G	163	1246	776	226	242	2	0	0

- Molecule 12 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	J	143	1134	717	207	204	6	0	0

- Molecule 13 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	K	122	921	571	173	173	4	0	0

- Molecule 14 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	L	146	Total	C	N	O	S	0	0
			1082	671	207	202	2		

- Molecule 15 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	N	120	Total	C	N	O	S	0	0
			962	588	187	182	5		

- Molecule 16 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	O	120	Total	C	N	O	S	0	0
			913	564	176	172	1		

- Molecule 17 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	P	112	Total	C	N	O	0	0
			916	584	178	154		

- Molecule 18 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	Q	117	Total	C	N	O	S	0	0
			940	591	189	156	4		

- Molecule 19 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	R	102	Total	C	N	O	S	0	0
			795	506	140	148	1		

- Molecule 20 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	S	112	Total	C	N	O	S	0	0
			868	541	168	155	4		

- Molecule 21 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	T	95	767	480	139	144	4	0	0

- Molecule 22 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	U	103	780	488	145	143	4	0	0

- Molecule 23 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	X	61	504	312	97	93	2	0	0

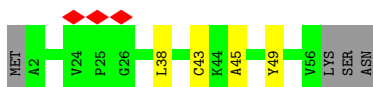
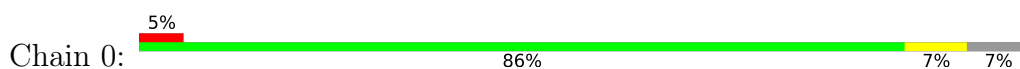
- Molecule 24 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	Y	56	441	273	86	81	1	0	0

### 3 Residue-property plots [i](#)

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

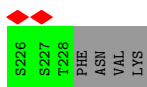
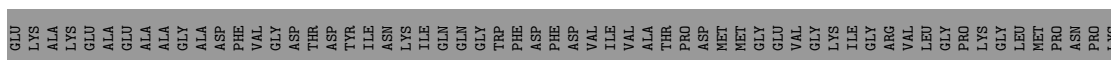
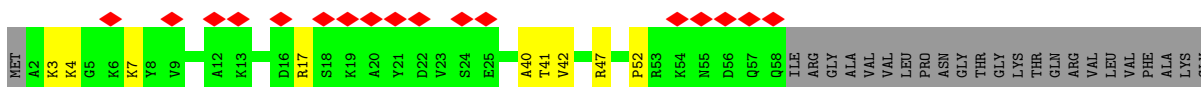
- Molecule 1: 50S ribosomal protein L32



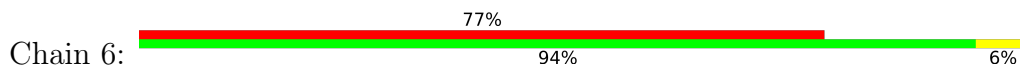
- Molecule 2: 50S ribosomal protein L34



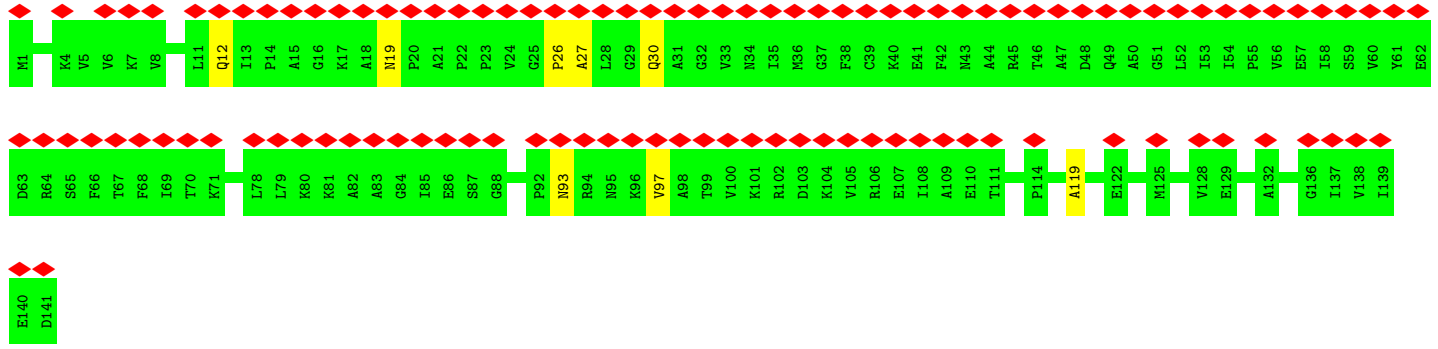
- Molecule 3: 50S ribosomal protein L1



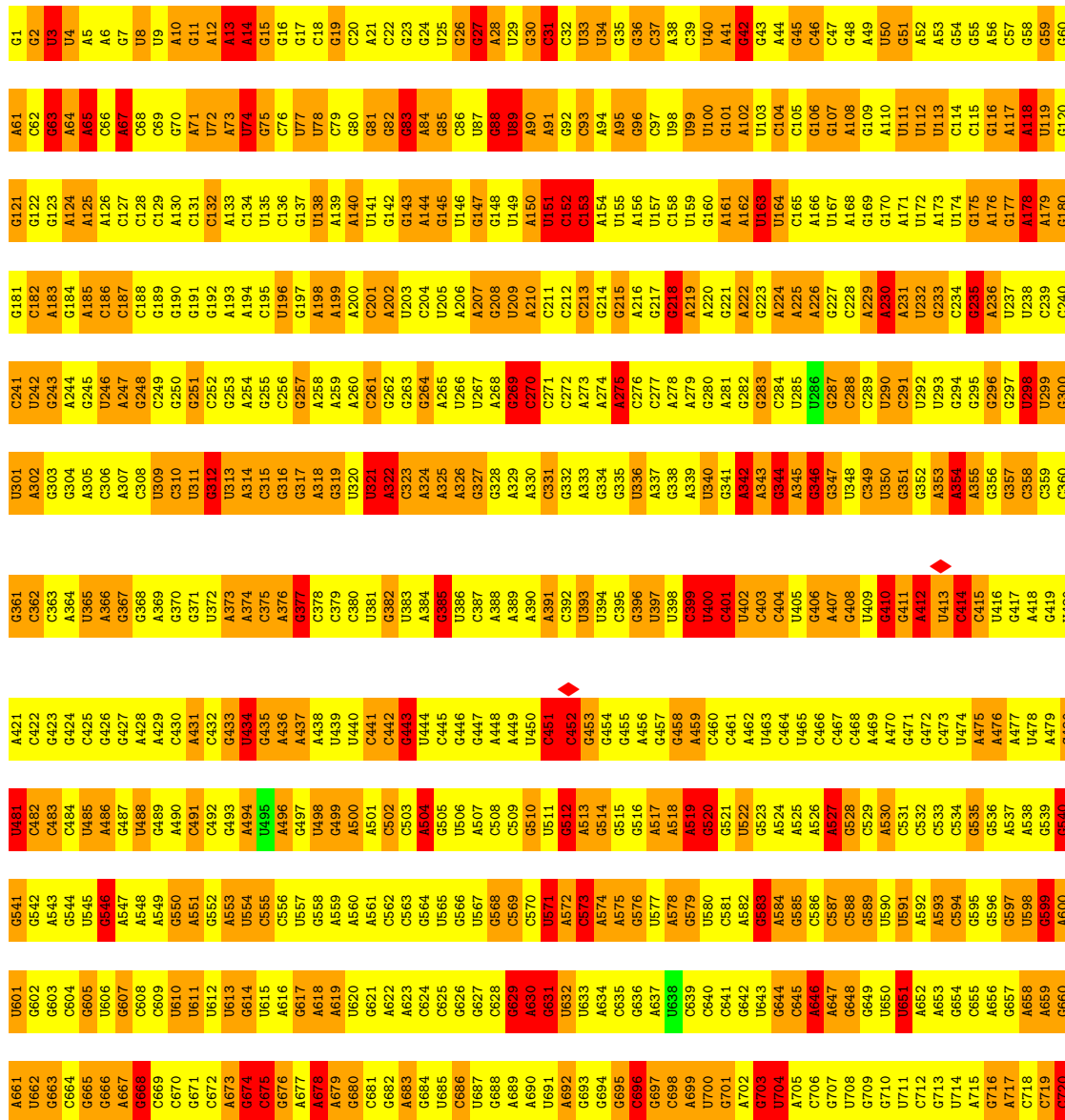
- Molecule 4: 50S ribosomal protein L11





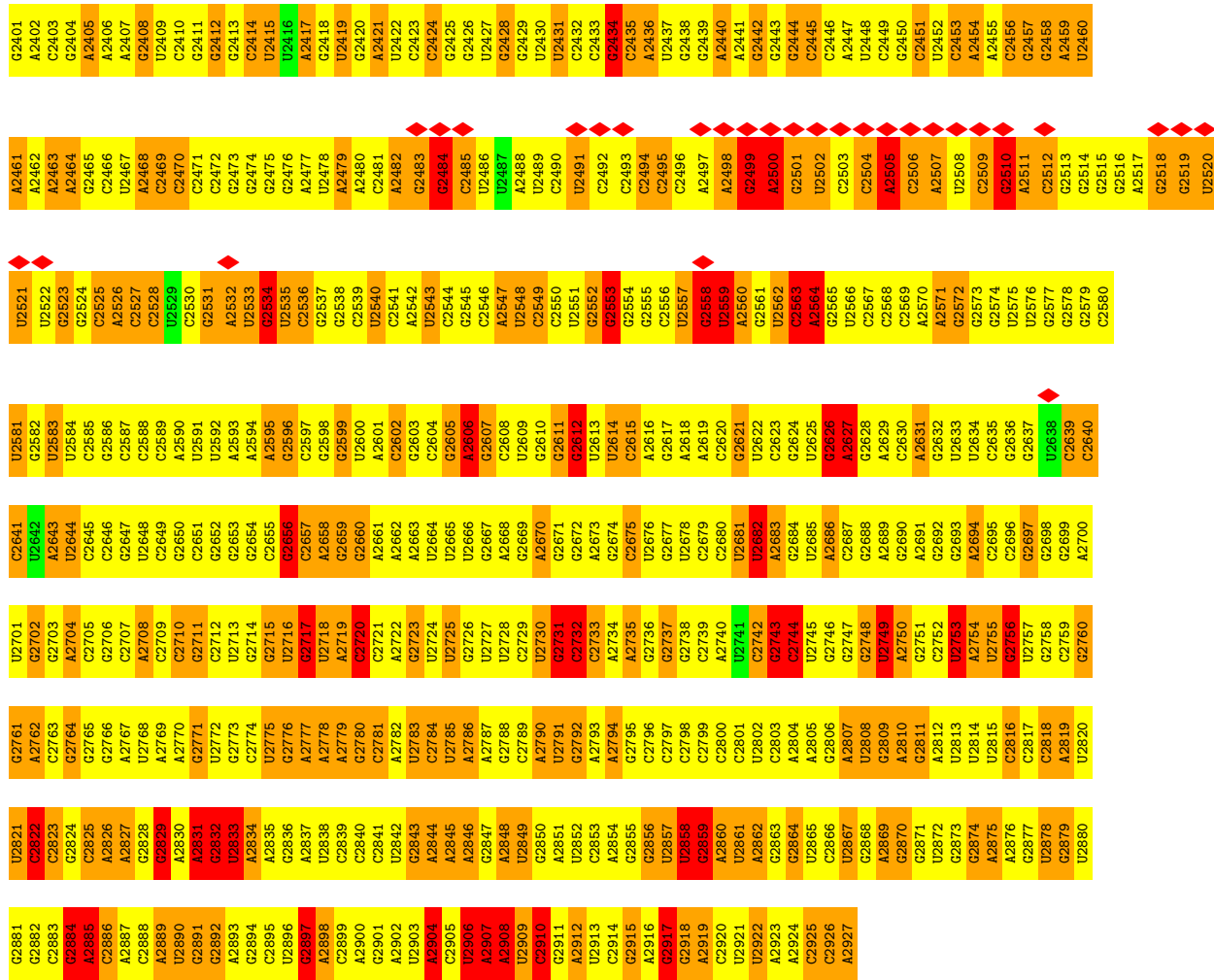


• Molecule 5: ribosome RNA 23S

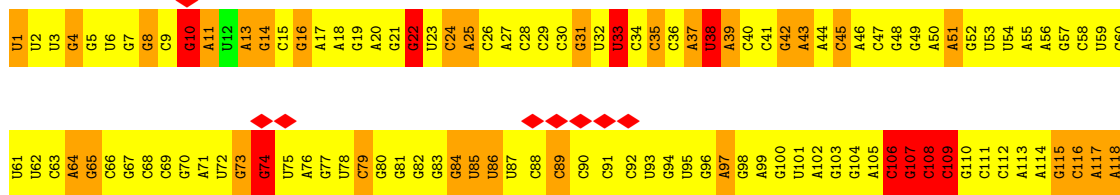


U1501	G1502	G1503	A1504	U1505	A1506	U1507	C1508	C1509	A1449	A1450	U1451	A1452	A1453	C1454	A1455	A1456	U1457	U1458	U1459	A1460	A1461	G1462	A1463	A1464	A1465	U1466	G1467	U1468	A1469	G1470	G1471	A1472	A1552	A1553	A1534	U1535	U1536	G1537	G1538	C1539	A1540	A1541	A1542	U1543	C1544	C1545	G1546	U1547	U1548	U1549	C1550	C1551	G1492	A1493	U1494	U1495	A1496	G1497	U1498	A1499	U1500																						
U1321	G1322	A1323	C1324	A1325	A1326	U1327	G1328	C1329	A1330	U1331	U1332	U1333	C1334	U1335	A1336	G1337	A1338	A1339	G1400	U1341	C1402	G1343	A1344	A1404	A1405	A1406	U1347	G1408	U1349	G1410	U1411	U1412	A1473	A1533	G1414	U1415	U1416	U1417	U1418	G1419	G1420	A1481	G1482	U1483	A1484	A1485	U1426	G1427	G1428	U1429	U1430	G1431	A1432	U1433	A1434	U1435	U1436	G1437	U1438	U1439	U1440																						
C1261	C1262	G1263	G1264	A1265	A1266	G1267	G1268	A1269	A1270	U1271	U1272	G1273	U1274	G1275	G1276	A1277	G1278	C1279	G1280	C1281	U1282	U1283	A1284	G1285	A1286	U1287	G1288	U1289	U1290	A1291	G1292	A1293	A1294	U1295	G1296	C1297	C1298	G1299	G1300	U1301	A1302	U1303	G1304	A1305	G1306	U1307	A1308	U1309	C1310	G1311	A1312	A1313	A1314	G1315	A1316	G1317	U1318	G1319	G1320																								
U1081	G1082	G1083	A1084	U1085	U1086	U1087	C1088	C1089	U1090	U1091	C1091	C1092	G1093	A1094	C1095	A1096	U1097	C1098	C1099	A1100	G1101	G1102	A1103	U1104	G1105	U1106	G1107	U1108	U1109	C1110	U1111	U1112	C1152	G1153	A1154	G1155	U1156	U1157	U1158	U1159	G1160	A1161	C1162	U1163	A1164	U1165	U1166	U1167	G1168	U1169	C1170	G1171	A1172	A1173	A1174	A1175	U1176	G1177	U1178	A1179	C1180	G1181	G1182	G1183	G1184	U1185	C1186	U1187	A1188	U1189	A1190	C1191	G1192	U1193	A1194	U1195	C1196	A1197	C1198	U1199	C1199	G1139	U1140
A1021	G1022	G1023	A1024	A1025	A1026	A1027	A1028	C1029	U1030	C1031	C1032	C1033	A1034	G1035	A1036	U1036	U1037	C1038	U1039	C1040	C1041	U1042	G1043	A1044	U1045	A1046	U1047	U1048	U1049	U1050	C1051	C1052	C1053	A1054	A1055	U1056	G1057	U1058	A1059	U1060	A1061	C1062	G1063	U1064	U1065	A1066	A1067	G1068	U1069	G1070	G1071	A1072	A1073	A1074	A1075	G1076	G1077	U1078	U1079	A1080																							
U901	G902	G903	G904	G905	G906	U907	A908	G909	A910	G911	C912	C913	C914	U915	G916	U917	U918	U919	G920	C921	U922	C923	U924	A925	G926	G927	G928	G929	C930	C931	C932	C933	U934	A935	C936	C937	G938	G939	U940	A941	U942	A943	C944	C945	G946	A947	A948	U949	C1010	C1011	U950	C951	A952	G953	U954	C955	U956	A957	A958	C959	U960																						
C961	C962	G963	A964	A965	U966	G967	C968	C969	A970	A971	U972	G973	A974	C975	U976	U977	U978	U979	C980	C981	U982	C983	U984	G985	A986	G987	A987	C988	U989	C990	A991	G992	A993	C994	U995	G996	C997	G998	A999	G1000	U1001	G1002	A1003	U1004	A1005	A1006	G1007	A1008	U1009	C1010	C1011	G1012	U1013	A1014	G1015	U1016	C1017	G1018	A1019	A1020																							
A841	C842	C843	U844	G845	G846	A847	G848	A849	U850	A851	C852	G853	U854	G855	U856	U857	U858	C859	U860	C861	U862	C863	U864	G865	A866	G867	A868	U869	U870	C871	C872	G873	U874	U875	U876	A877	G878	G879	C880	U881	A882	G883	C884	C885	U886	C887	A888	A889	G890	C891	U892	A893	C894	G895	G896	G897	U898	C899	U900																								
A761	A762	C763	C764	A765	A766	C767	C768	C769	A770	A771	C772	A773	A774	G775	C776	C777	C778	A779	U780	U781	U782	U783	U784	U785	A786	A787	U788	U789	C790	C791	C792	U793	U794	U795	U796	U797	U798	U799	U800	U801	U802	U803	U804	U805	U806	U807	U808	U809	U810	U811	U812	U813	U814	U815	U816	U817	U818	U819	U820	U821	U822	G823	G824	C825	U826	G827	A828	A829	A830	U831	C832	C833	C834	A835	A836	U837	C838	C839	A840				
G721	A722	A723	C724	C725	C726	A727	C728	G729	U730	G731	U732	U733	C734	U735	A736	C737	C738	C739	A740	U741	U742	U743	U744	C745	A746	G747	U748	U749	U750	U751	A752	A753	G754	U755	U756	C757	A758	U759	G760	A761	G762	A763	G764	A765	C766	U767	G768	A769	U770	U771	C772	G773	A774	G775	C776	C777	C778	C779	U780																								

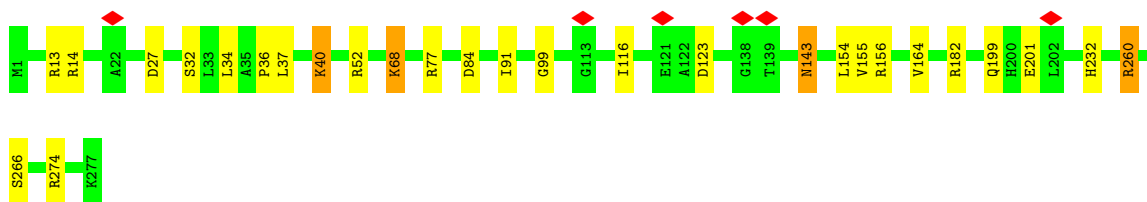
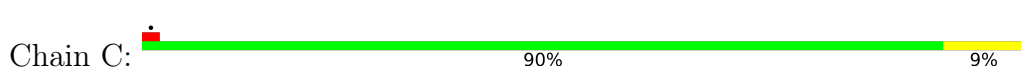
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• Molecule 6: ribosome RNA 5S



• Molecule 7: 50S ribosomal protein L2




- Molecule 8: 50S ribosomal protein L3

Chain D:  89% 9% ..




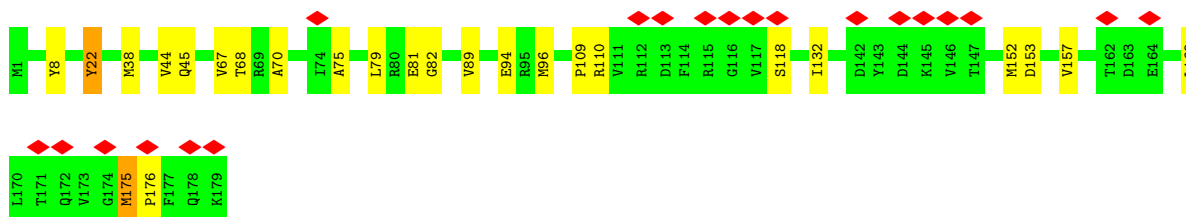
- Molecule 9: 50S ribosomal protein L4

Chain E:  86% 12% .




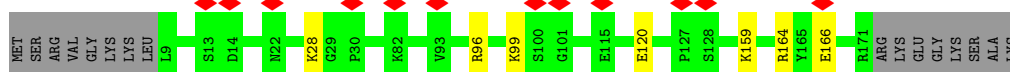
- Molecule 10: 50S ribosomal protein L5

Chain F:  11% 86% 13% .




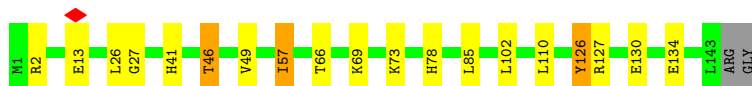
- Molecule 11: 50S ribosomal protein L6

Chain G:  7% 87% 9% .



- Molecule 12: 50S ribosomal protein L13

Chain J:  86% 11% ..




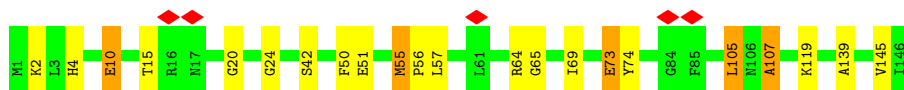
- Molecule 13: 50S ribosomal protein L14

Chain K:  93% 7% .



- Molecule 14: 50S ribosomal protein L15

Chain L:  85% 12%




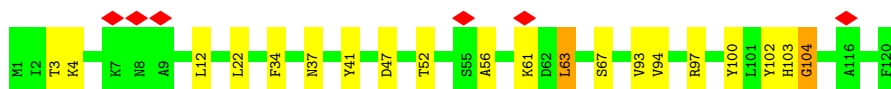
- Molecule 15: 50S ribosomal protein L17

Chain N:  94% 6%



- Molecule 16: 50S ribosomal protein L18

Chain O:  5% 83% 15%



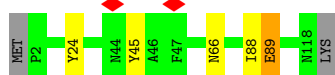
- Molecule 17: 50S ribosomal protein L19

Chain P:  73% 20%




- Molecule 18: 50S ribosomal protein L20

Chain Q:  94%




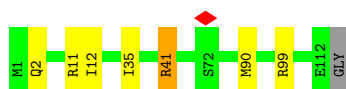
- Molecule 19: 50S ribosomal protein L21

Chain R:  88% 11%

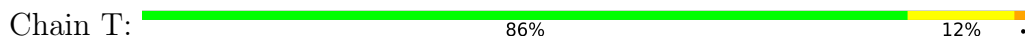


- Molecule 20: 50S ribosomal protein L22

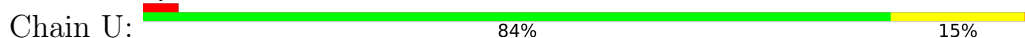
Chain S:  93% 5%



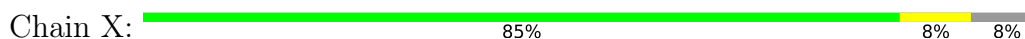
- Molecule 21: 50S ribosomal protein L23



- Molecule 22: 50S ribosomal protein L24



- Molecule 23: 50S ribosomal protein L29



- Molecule 24: 50S ribosomal protein L30



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	21020	Depositor
Resolution determination method	OTHER	Depositor
CTF correction method	Each particle	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	20	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	59000	Depositor
Image detector	FEI EAGLE (4k x 4k)	Depositor
Maximum map value	10.841	Depositor
Minimum map value	-4.301	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	2.7	Depositor
Map size ( $\text{\AA}$ )	384.0, 384.0, 384.0	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.5, 1.5, 1.5	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	0	1.04	0/440	1.06	1/584 (0.2%)
2	2	1.26	0/371	1.06	0/483
3	5	0.87	0/921	1.10	1/1239 (0.1%)
4	6	0.91	0/1058	1.02	0/1427
5	A	1.69	134/69349 (0.2%)	2.70	8798/108189 (8.1%)
6	B	1.64	4/2843 (0.1%)	2.64	336/4432 (7.6%)
7	C	1.01	0/2166	1.09	2/2902 (0.1%)
8	D	0.96	0/1590	1.07	0/2130
9	E	0.97	0/1586	1.08	2/2139 (0.1%)
10	F	0.96	0/1432	1.09	2/1920 (0.1%)
11	G	0.98	0/1264	1.05	0/1709
12	J	0.94	0/1157	1.04	0/1557
13	K	1.03	0/928	1.05	0/1245
14	L	0.98	0/1094	1.09	2/1457 (0.1%)
15	N	1.08	0/969	1.06	0/1294
16	O	1.01	0/922	1.05	1/1236 (0.1%)
17	P	1.10	0/929	1.21	5/1243 (0.4%)
18	Q	1.06	0/952	1.08	4/1266 (0.3%)
19	R	0.91	0/806	1.09	0/1080
20	S	1.01	0/877	1.13	1/1179 (0.1%)
21	T	1.00	0/774	1.11	1/1030 (0.1%)
22	U	0.87	0/790	1.15	0/1054
23	X	1.05	0/505	1.02	0/671
24	Y	0.97	0/443	1.01	0/594
All	All	1.55	138/94166 (0.1%)	2.45	9156/142060 (6.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
5	A	0	447

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Mol	Chain	#Chirality outliers	#Planarity outliers
6	B	0	15
8	D	0	2
9	E	0	1
14	L	0	2
15	N	0	1
17	P	0	3
21	T	0	3
All	All	0	474

The worst 5 of 138 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1253	A	N7-C5	-7.44	1.34	1.39
5	A	353	A	N7-C5	-7.42	1.34	1.39
5	A	629	G	C2'-C1'	-7.08	1.45	1.53
5	A	1449	C	P-O5'	-7.08	1.52	1.59
5	A	2297	A	N7-C5	-6.86	1.35	1.39

The worst 5 of 9156 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	10	G	P-O3'-C3'	26.30	151.26	119.70
5	A	1339	A	P-O3'-C3'	26.04	150.94	119.70
5	A	178	A	P-O3'-C3'	22.26	146.41	119.70
5	A	2062	A	P-O3'-C3'	21.01	144.91	119.70
5	A	74	U	P-O3'-C3'	20.60	144.42	119.70

There are no chirality outliers.

5 of 474 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
5	A	14	A	Sidechain
5	A	15	G	Sidechain
5	A	27	G	Sidechain
5	A	28	A	Sidechain
5	A	3	U	Sidechain

## 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	0	433	0	454	0	0
2	2	368	0	410	0	0
3	5	910	0	944	2	0
4	6	1044	0	1098	1	0
5	A	61914	0	31166	148	0
6	B	2542	0	1288	6	0
7	C	2129	0	2225	0	0
8	D	1568	0	1635	2	0
9	E	1567	0	1652	3	0
10	F	1413	0	1479	2	0
11	G	1246	0	1273	0	0
12	J	1134	0	1178	3	0
13	K	921	0	977	0	0
14	L	1082	0	1132	3	0
15	N	962	0	995	0	0
16	O	913	0	947	4	0
17	P	916	0	987	2	0
18	Q	940	0	1005	1	0
19	R	795	0	838	0	0
20	S	868	0	930	0	0
21	T	767	0	813	0	0
22	U	780	0	838	1	0
23	X	504	0	541	0	0
24	Y	441	0	478	0	0
All	All	86157	0	55283	174	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 1.

The worst 5 of 174 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:1799:G:H1	5:A:2011:U:H3	1.32	0.76
5:A:2557:U:H3	5:A:2564:A:H61	1.39	0.68
5:A:1672:A:H61	5:A:1684:U:H3	1.43	0.65
5:A:1339:A:C2	5:A:1679:A:C2	2.87	0.62
5:A:1976:C:H2'	5:A:1977:G:H5''	1.80	0.62

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	53/59 (90%)	40 (76%)	10 (19%)	3 (6%)	1	18
2	2	42/44 (96%)	38 (90%)	2 (5%)	2 (5%)	2	21
3	5	116/232 (50%)	96 (83%)	11 (10%)	9 (8%)	1	13
4	6	139/141 (99%)	117 (84%)	15 (11%)	7 (5%)	2	20
7	C	275/277 (99%)	224 (82%)	33 (12%)	18 (6%)	1	16
8	D	204/209 (98%)	158 (78%)	38 (19%)	8 (4%)	3	23
9	E	204/207 (99%)	166 (81%)	19 (9%)	19 (9%)	0	11
10	F	177/179 (99%)	136 (77%)	27 (15%)	14 (8%)	1	13
11	G	161/179 (90%)	150 (93%)	9 (6%)	2 (1%)	13	50
12	J	141/145 (97%)	117 (83%)	14 (10%)	10 (7%)	1	14
13	K	120/122 (98%)	103 (86%)	11 (9%)	6 (5%)	2	20
14	L	144/146 (99%)	105 (73%)	24 (17%)	15 (10%)	0	8
15	N	118/120 (98%)	96 (81%)	19 (16%)	3 (2%)	5	32
16	O	118/120 (98%)	87 (74%)	18 (15%)	13 (11%)	0	7
17	P	110/115 (96%)	71 (64%)	23 (21%)	16 (14%)	0	4
18	Q	115/119 (97%)	104 (90%)	10 (9%)	1 (1%)	17	57
19	R	100/102 (98%)	79 (79%)	13 (13%)	8 (8%)	1	12
20	S	110/113 (97%)	97 (88%)	8 (7%)	5 (4%)	2	22
21	T	93/95 (98%)	70 (75%)	14 (15%)	9 (10%)	0	10
22	U	101/103 (98%)	71 (70%)	18 (18%)	12 (12%)	0	6
23	X	59/66 (89%)	53 (90%)	4 (7%)	2 (3%)	3	26
24	Y	54/59 (92%)	47 (87%)	5 (9%)	2 (4%)	3	24
All	All	2754/2952 (93%)	2225 (81%)	345 (12%)	184 (7%)	2	15

5 of 184 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	5	41	THR
3	5	209	VAL
3	5	212	VAL
4	6	93	ASN
7	C	34	LEU

### 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	0	49/53 (92%)	49 (100%)	0	100	100
2	2	39/39 (100%)	38 (97%)	1 (3%)	46	66
3	5	98/185 (53%)	93 (95%)	5 (5%)	24	48
4	6	110/110 (100%)	110 (100%)	0	100	100
7	C	225/225 (100%)	213 (95%)	12 (5%)	22	47
8	D	167/170 (98%)	157 (94%)	10 (6%)	19	44
9	E	169/170 (99%)	163 (96%)	6 (4%)	35	59
10	F	154/154 (100%)	147 (96%)	7 (4%)	27	52
11	G	138/151 (91%)	133 (96%)	5 (4%)	35	59
12	J	122/123 (99%)	113 (93%)	9 (7%)	13	38
13	K	101/101 (100%)	98 (97%)	3 (3%)	41	63
14	L	110/110 (100%)	107 (97%)	3 (3%)	44	65
15	N	100/100 (100%)	97 (97%)	3 (3%)	41	63
16	O	93/93 (100%)	90 (97%)	3 (3%)	39	61
17	P	97/100 (97%)	90 (93%)	7 (7%)	14	39
18	Q	96/98 (98%)	95 (99%)	1 (1%)	76	86
19	R	84/84 (100%)	79 (94%)	5 (6%)	19	44
20	S	93/93 (100%)	91 (98%)	2 (2%)	52	71
21	T	85/85 (100%)	83 (98%)	2 (2%)	49	69
22	U	87/87 (100%)	84 (97%)	3 (3%)	37	60

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	X	54/57 (95%)	51 (94%)	3 (6%)	21	46
24	Y	51/53 (96%)	51 (100%)	0	100	100
All	All	2322/2441 (95%)	2232 (96%)	90 (4%)	36	56

5 of 90 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
13	K	90	ASP
17	P	74	PHE
14	L	51	GLU
16	O	94	VAL
19	R	10	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 17 such sidechains are listed below:

Mol	Chain	Res	Type
16	O	103	HIS
20	S	2	GLN
10	F	37	ASN
10	F	172	GLN
11	G	23	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
5	A	2882/2927 (98%)	895 (31%)	205 (7%)
6	B	118/119 (99%)	24 (20%)	3 (2%)
All	All	3000/3046 (98%)	919 (30%)	208 (6%)

5 of 919 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
5	A	2	G
5	A	3	U
5	A	4	U
5	A	8	U
5	A	10	A

5 of 208 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
5	A	1606	A
5	A	1999	A
5	A	2870	G
5	A	1629	C
5	A	1787	G

#### 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.

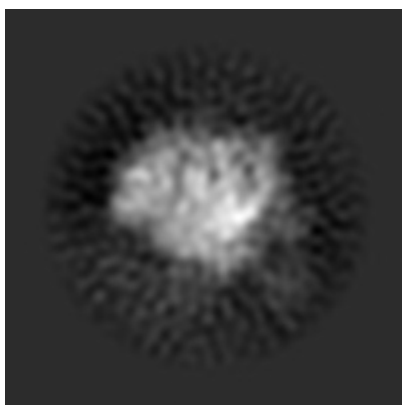
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-5642. These allow visual inspection of the internal detail of the map and identification of artifacts.

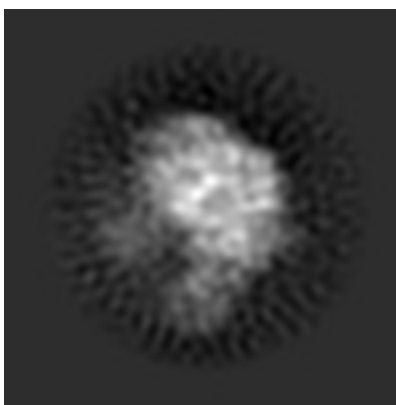
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

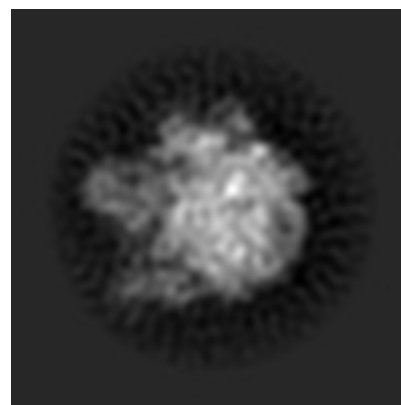
#### 6.1.1 Primary map



X



Y

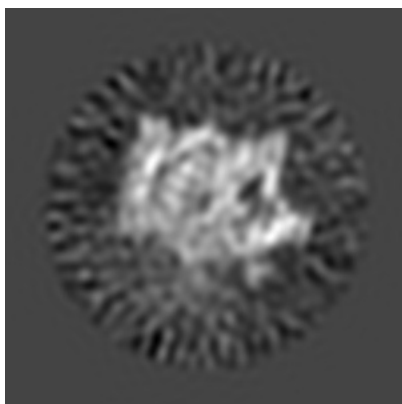


Z

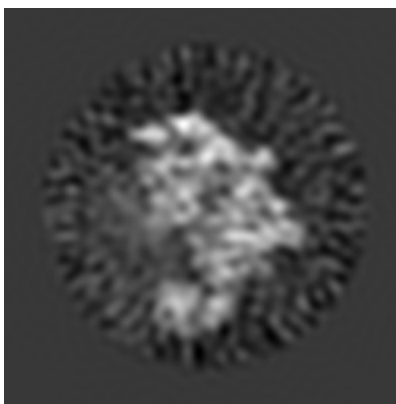
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

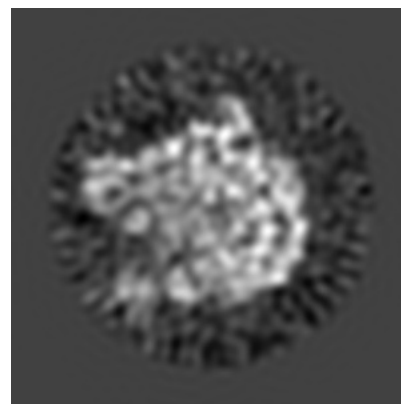
#### 6.2.1 Primary map



X Index: 128



Y Index: 128



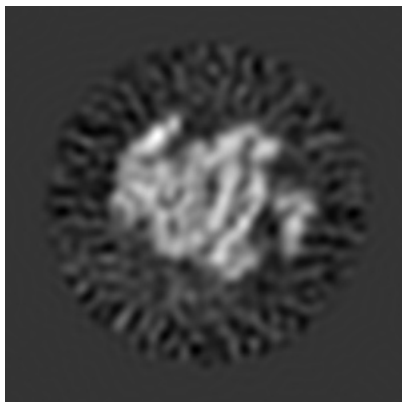
Z Index: 128



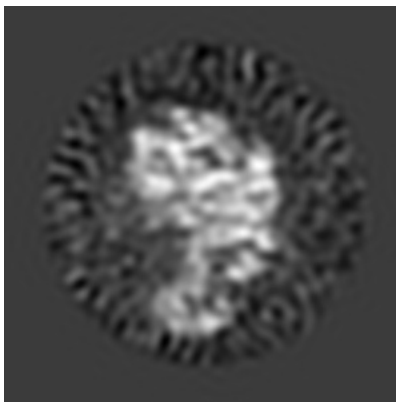
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [\(i\)](#)

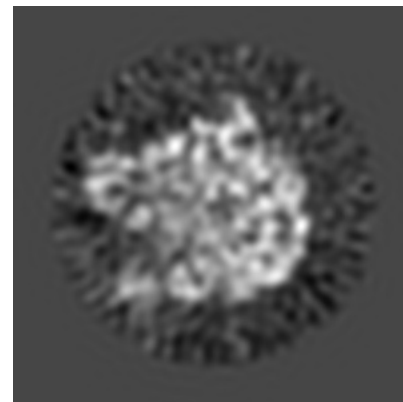
### 6.3.1 Primary map



X Index: 143



Y Index: 139

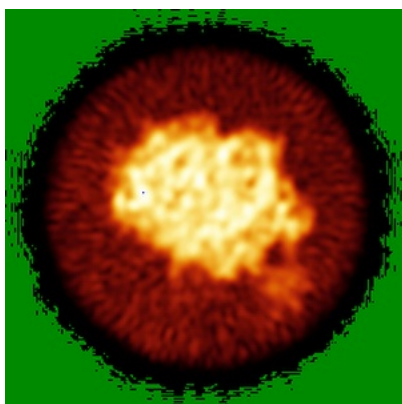


Z Index: 130

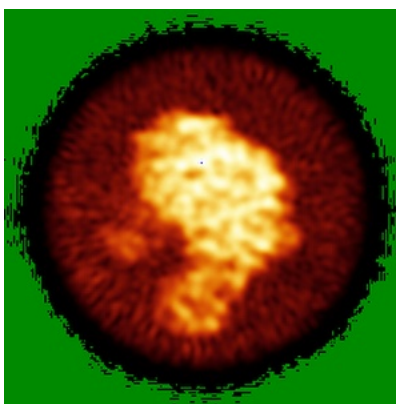
The images above show the largest variance slices of the map in three orthogonal directions.

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

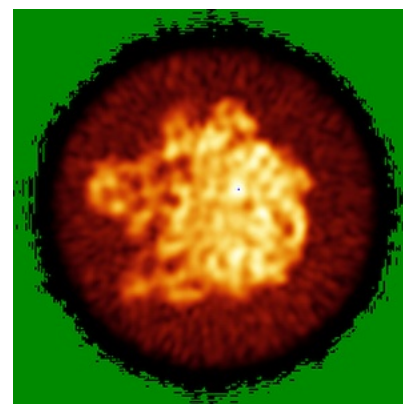
### 6.4.1 Primary map



X



Y

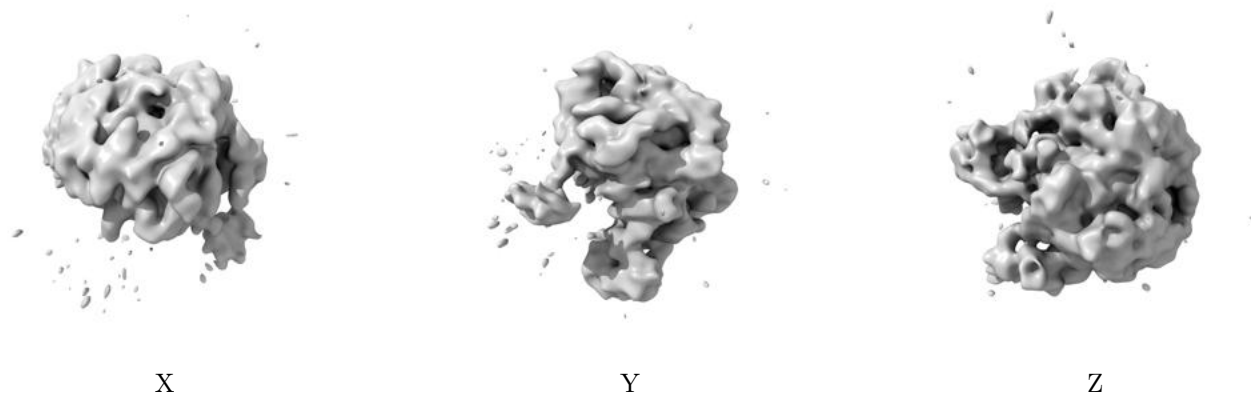


Z

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 2.7. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

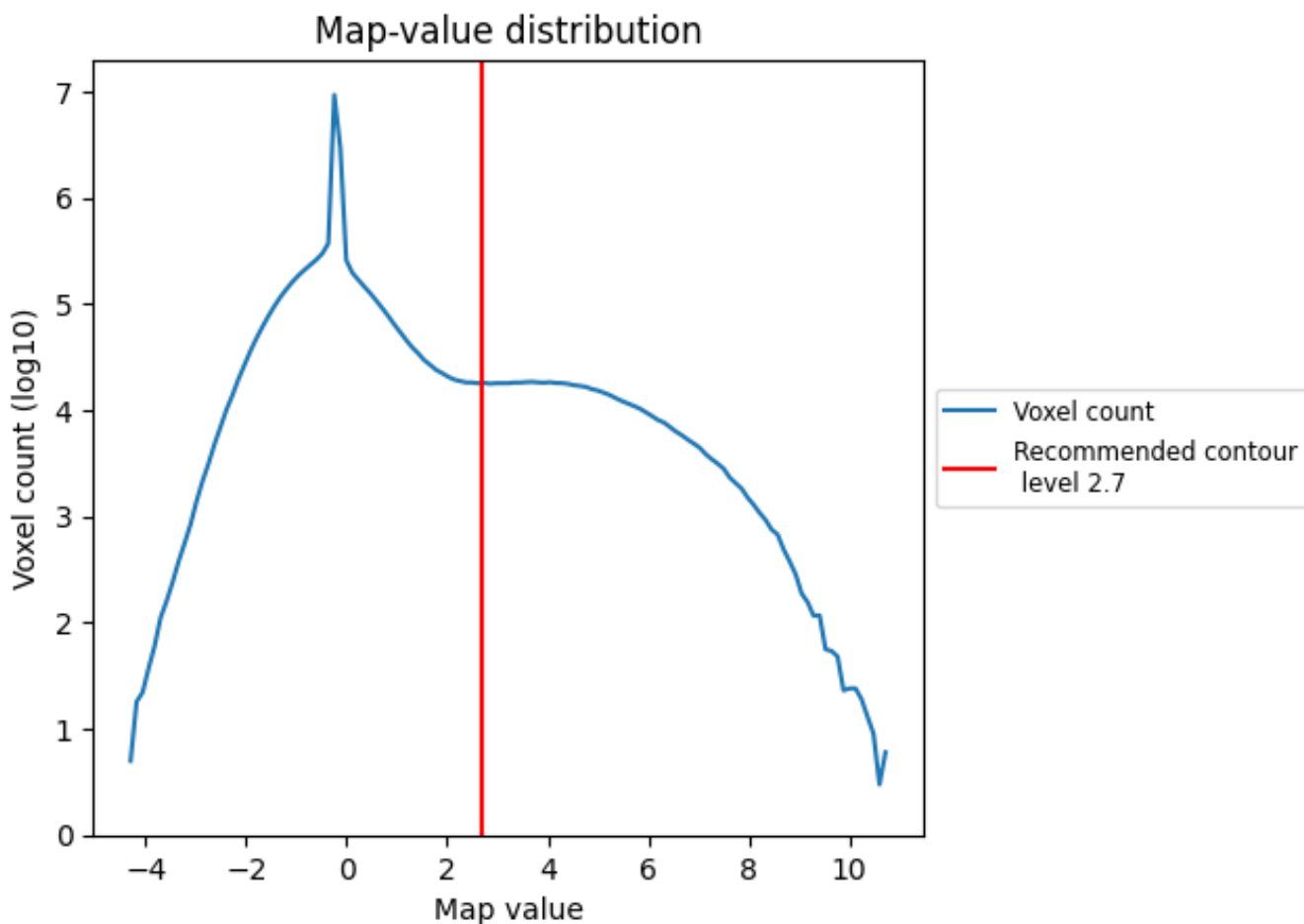
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

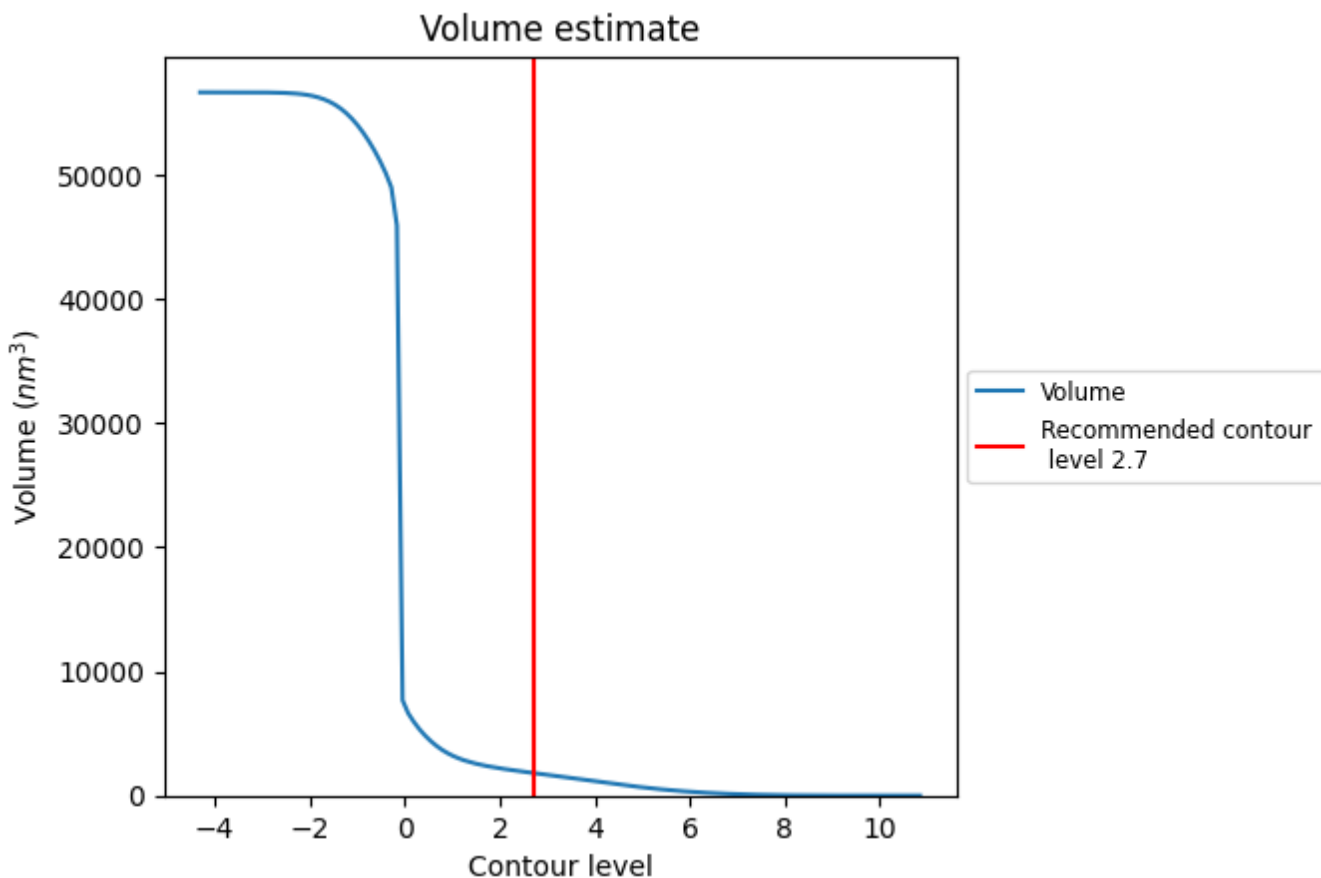
This section contains the results of statistical analysis of the map.

### 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.

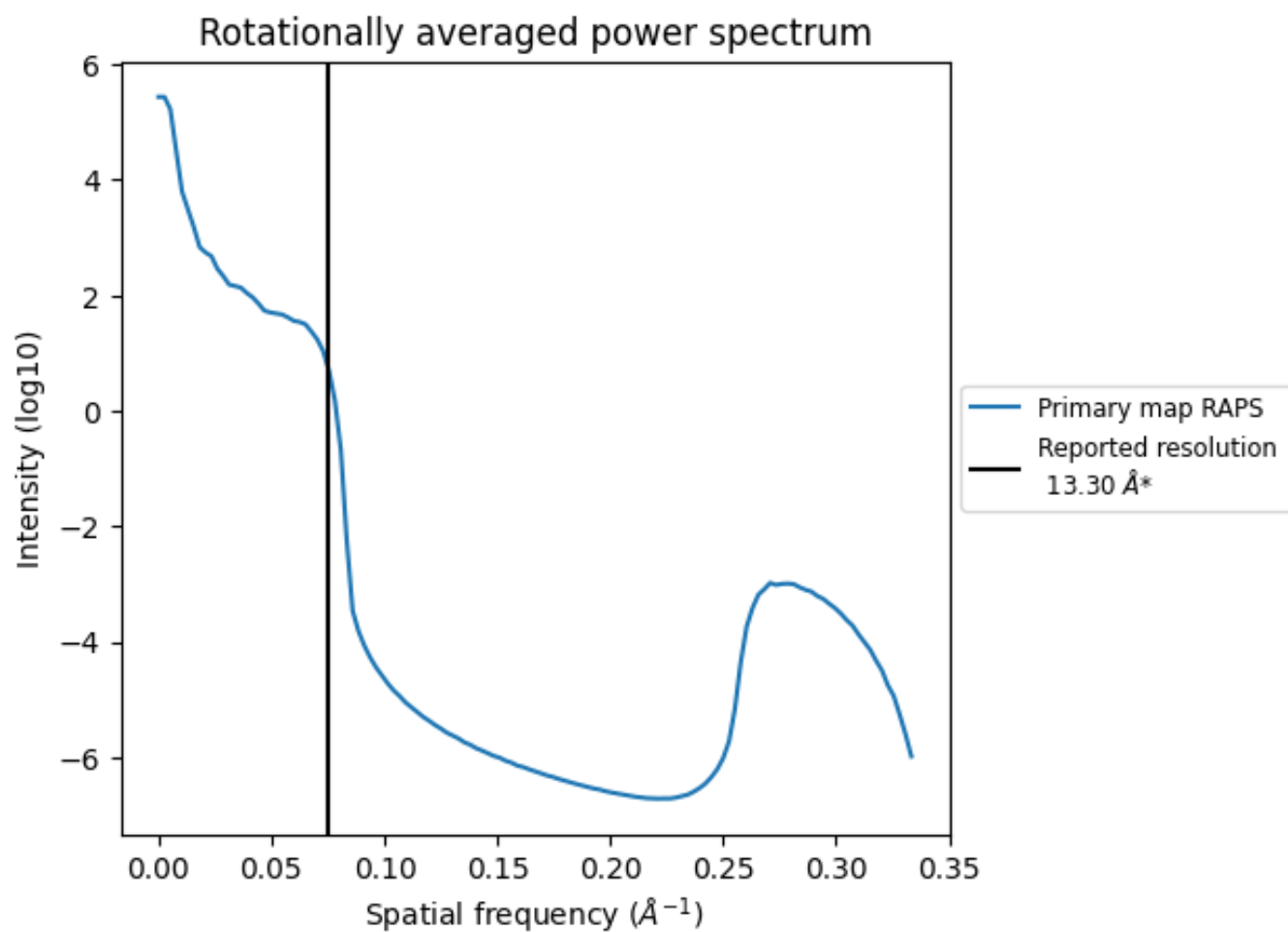
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1820 nm<sup>3</sup>; this corresponds to an approximate mass of 1644 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  $0.075 \text{\AA}^{-1}$

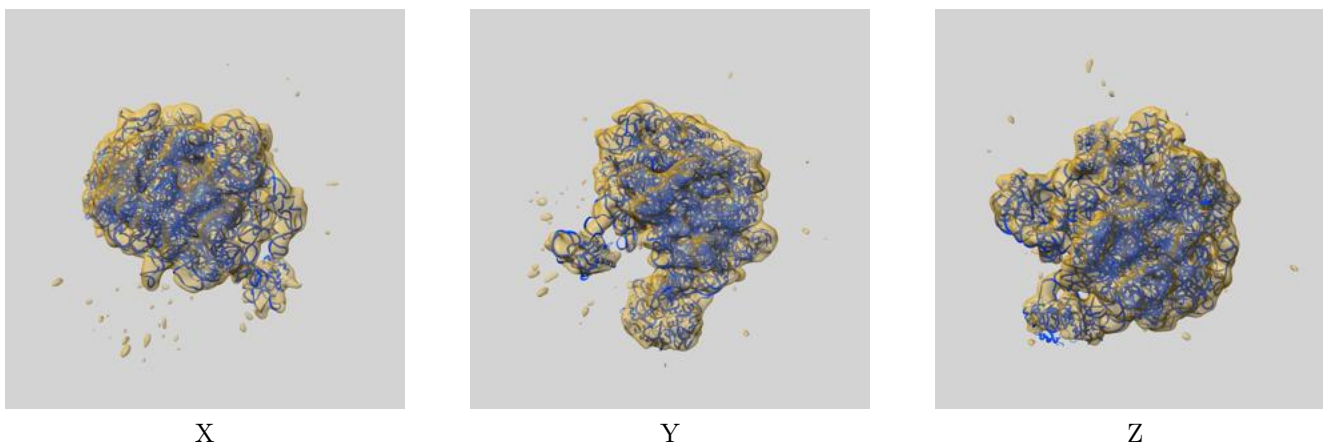
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

## 9 Map-model fit [i](#)

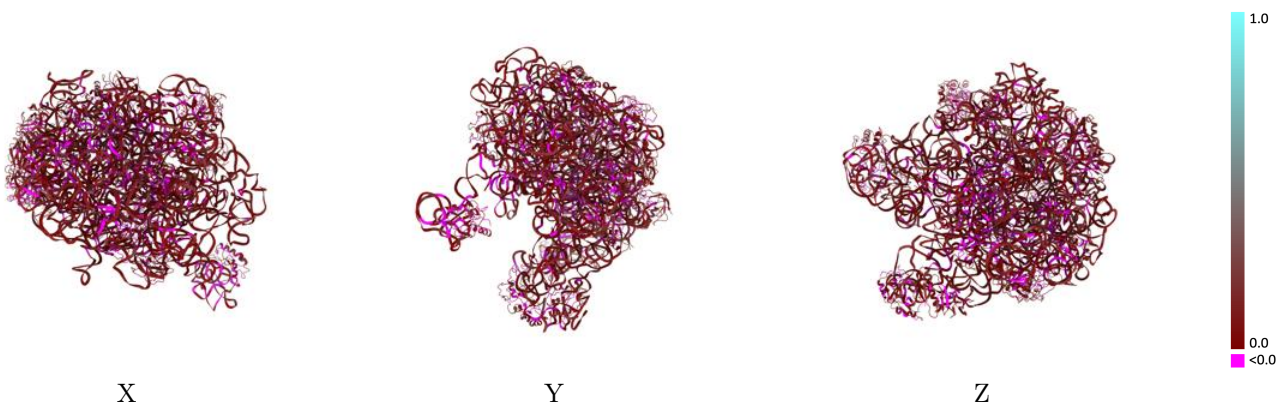
This section contains information regarding the fit between EMDB map EMD-5642 and PDB model 3J3V. Per-residue inclusion information can be found in section 3 on page 8.

### 9.1 Map-model overlay [i](#)



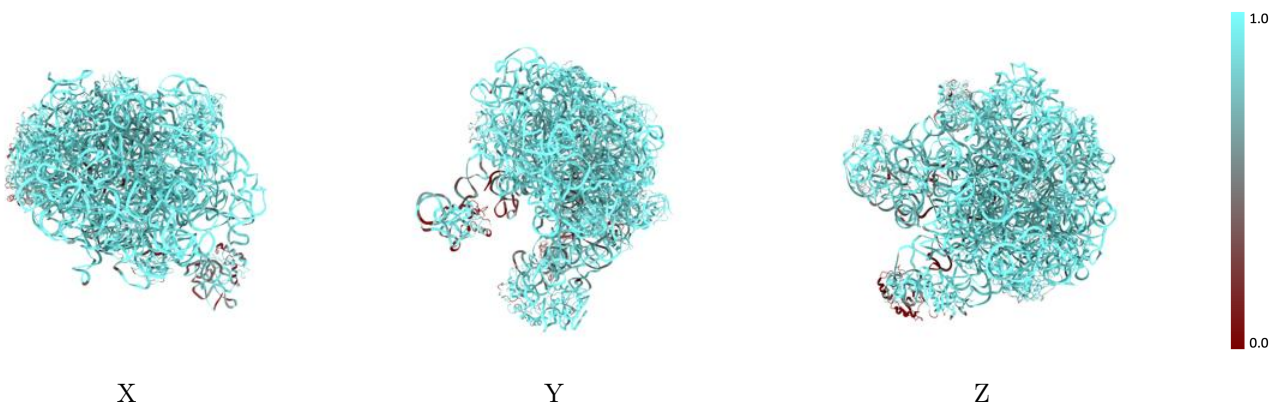
The images above show the 3D surface view of the map at the recommended contour level 2.7 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



The images above show the model with each residue coloured according 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.

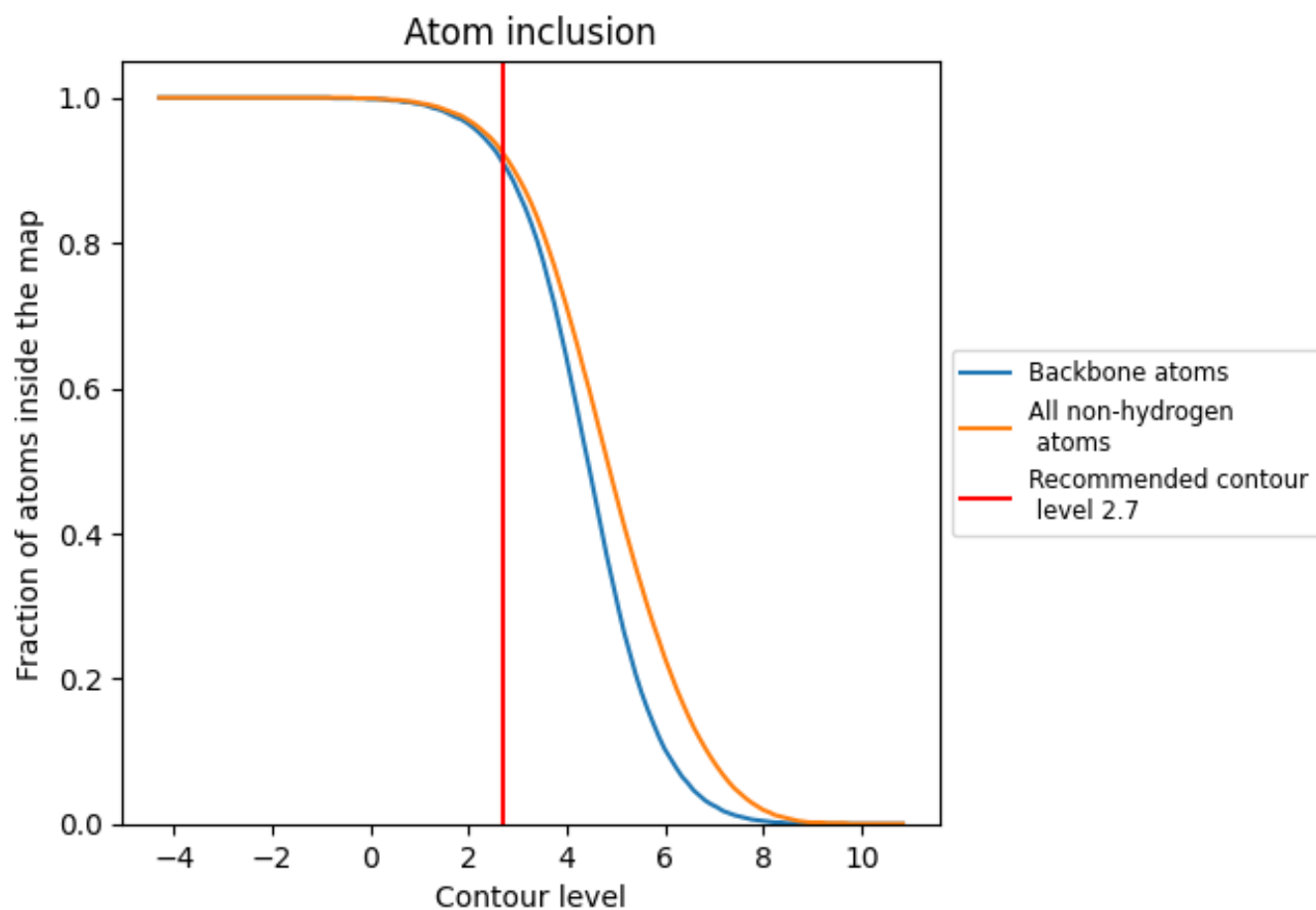
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (2.7).





















































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 92% 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 (2.7) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9230	 0.0810
0	 0.9480	 0.0410
2	 1.0000	 0.0160
5	 0.6230	 0.0580
6	 0.2030	 0.0410
A	 0.9360	 0.0910
B	 0.8530	 0.0870
C	 0.9600	 0.0350
D	 0.9660	 0.0560
E	 0.9690	 0.0560
F	 0.8480	 0.0720
G	 0.8840	 0.0820
J	 0.9580	 0.0420
K	 0.9360	 0.0590
L	 0.9120	 0.0420
N	 1.0000	 0.0510
O	 0.9280	 0.0730
P	 0.9120	 0.0450
Q	 0.9670	 0.0250
R	 0.9800	 0.0700
S	 0.9680	 0.0470
T	 0.9910	 0.0490
U	 0.9550	 0.0470
X	 0.9920	 0.0830
Y	 0.7490	 0.0410

