



wwPDB EM Validation Summary Report ⓘ

Feb 27, 2024 – 06:56 AM EST

PDB ID : 6V85
EMDB ID : EMD-21095
Title : Parainfluenza virus 5 L-P complex
Authors : Abdella, R.; He, Y.
Deposited on : 2019-12-10
Resolution : 4.38 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.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

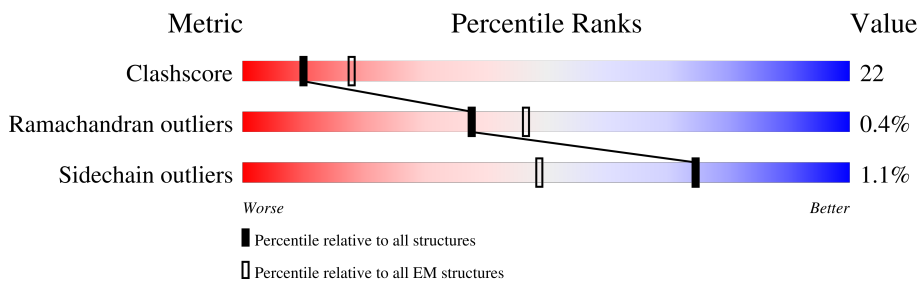
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.38 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

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	2255	
2	B	392	
2	C	392	
2	D	392	
2	E	392	
2	F	392	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 17878 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 RNA-directed RNA polymerase L.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1901	15200	9769	2578	2770	83	0	0

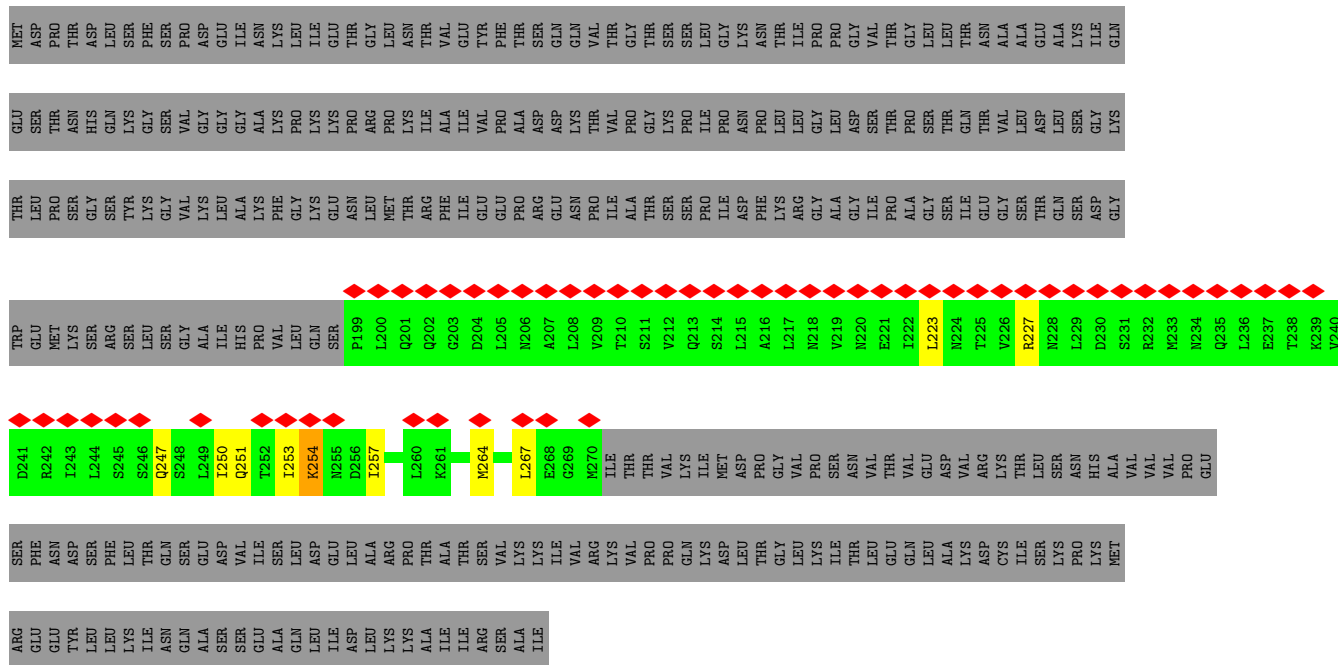
- Molecule 2 is a protein called Phosphoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	F	47	374	238	64	70	2	0	0
2	B	72	569	350	101	115	3	4	0
2	C	74	582	357	103	119	3	4	0
2	D	72	569	350	101	115	3	4	0
2	E	74	582	357	103	119	3	4	0

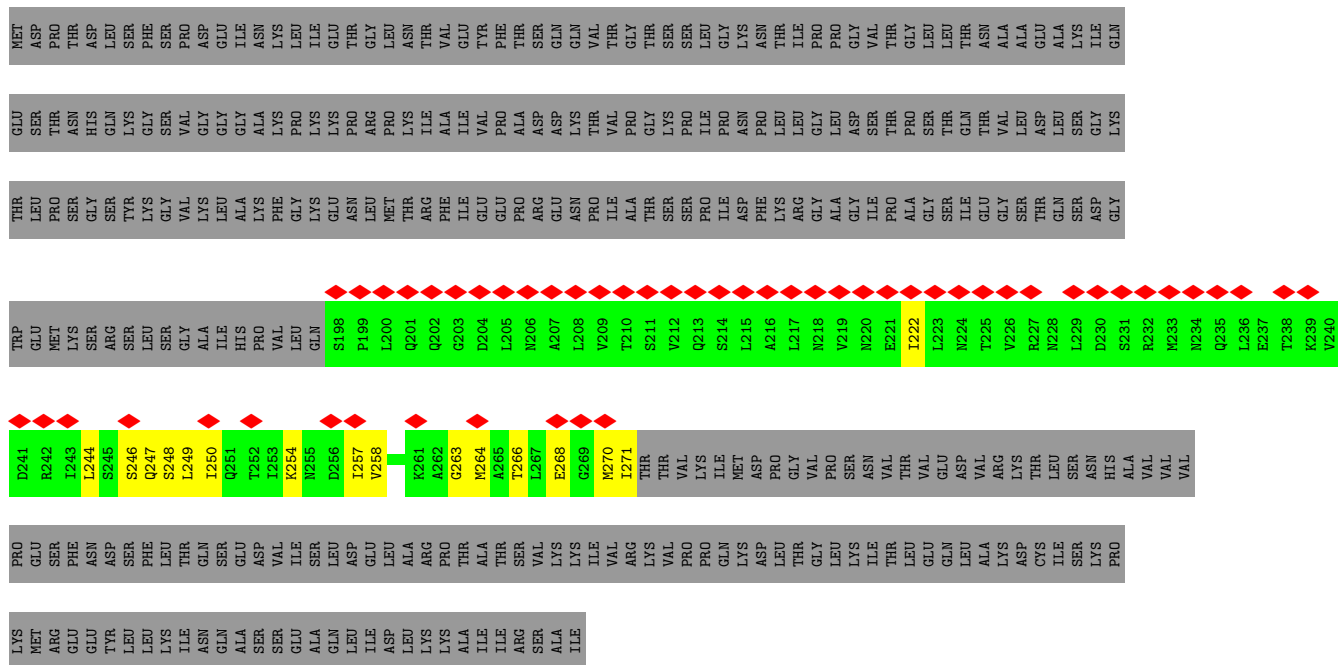
- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
3	A	2	Total	Zn	0
			2	2	

VAL	PRO	THR	THR	CYS	ILE	GLU	ASP	ASP	ASP	LEU	C1731	T1732	M1733	D1734	Y1735	W1738	I1739	I1740	E1741	S1742	M1743	A1744	A1745	A1673	A1674	E1675	K1676	A1677	S1677	L1682	T1683	K1684	K1685	L1686	L1687	I1690	R1691	F1684	K1765	L1766	L1767	L1768	P1769	S1770	H1771	H1772	R1775	P1776	L1777	G1778	L1779	S1780	L1781	T1782	A1783	W1784																																						
F1645	L1646	R1647	K1648	V1649	L1654	S1655	S1656	I1657	F1658	M1659	L1660	F1663	M1664	Y1665	VAL	ASN	VAL	GLU	ASN	PRO	ARG	N1746	N1747	N1748	A1674	A1675	A1676	S1677	L1682	T1683	K1684	K1685	L1686	L1687	I1690	R1691	F1684	K1765	L1766	L1767	L1768	P1769	S1770	H1771	H1772	R1775	P1776	L1777	G1778	L1779	S1780	L1781	T1782	A1783	W1784																																							
M1582	V1583	L1584	S1585	G1588	D1589	L1590	E1591	L1592	V1593	V1594	T1595	SER	GLU	ASP	SER	LEU	ILE	LEU	SER	D1604	R1605	S1606	M1607	M1608	L1609	I1610	A1611	K1612	K1613	L1614	T1615	L1616	L1617	S1618	L1619	L1620	H1621	L1625	E1626	L1627	P1628	K1629	L1630	K1631	F1632	S1633	S1634	P1635	D1636	D1637	K1638	C1639	F1640	A1641	L1642	T1643	E1644																																					
L1497	S1500	Y1501	Q1502	M1503	Y1504	Y1505	L1506	R1507	V1508	V1509	G1510	W1511	S1512	N1513	I1514	V1515	D1516	M1520	R1523	R1524	A1528	A1529	L1530	L1533	A1534	S1535	L1537	S1538	H1539	P1540	K1541	L1542	F1543	R1544	R1545	A1546	L1555	ASN	ALA	PRO	HIS	A1561	D1564	Y1565	I1566	F1567	K1568	L1569	L1570	L1571	L1572	L1573	L1574	L1575	L1576	L1577	L1578	L1581																																				
G1172	V1176	Y1180	Q1183	C1184	ALA	ALA	GLY	ASP	ASN	ARG	F1191	T1192	W1193	F1194	S1198	G1203	P1206	M1209	R1213	W1214	P1215	Y1216	S1219	R1220	E1223	R1224	R1225	VAL	ALA	SER	MET	ALA	Y1231	R1233	R1234	A1235	S1236	L1239	L1243	R1244	L1245	I1250	W1251	A1252	F1253	E1258	R1270	V1271	M1272	L1275	E1276	Q1277	L1278	P1285	T1286	S1287	A1288	H1293	R1294	D1295	D1296	G1297	T1298	T1299	T1300	W1301	K1302	F1303	L1304	F1305	A1306	S1307	S1308	F1311	S1318	M1319	D1320	E1321	Q1322	V1323	L1324	T1325	D1328	K1329	T1330	A1331	D1332	S1333	M1334	G1344	L1345	W1351	I1356	M1357
R1358	T1359	F1360	S1363	H1366	L1367	H1368	T1369	C1373	C1374	V1375	R1376	D1379	L1383	S1384	E1385	A1386	V1389	P1391	H1392	I1393	T1394	P1395	SER	ASN	LYS	PHE	VAL	PHE	ASP	GLU	ASP	PRO	LEU	SER	SER	GLU	TYR	THR	ALA	LYS	LEU	GLU	SER	LEU	THR	ALA	LYS	LEU	GLU	SER	LEU	THR	ALA	LYS	LEU	GLN	LEU																																					
GLY	ASN	ILE	ASP	VAL	ASP	MET	THR	G1435	T1438	Q1442	F1443	T1444	A1445	R1446	I1449	M1450	A1451	I1452	T1453	GLY	LEU	ASP	GLU	SER	ILE	ALA	VAL	ALA	SER	ASP	TYR	VAL	VAL	ASN	TRP	I1476	S1477	M1480	Y1481	E1486	L1487	F1488	M1489	Y1490	W1493	E1494																																																
L1497	S1500	Y1501	Q1502	M1503	Y1504	Y1505	L1506	R1507	V1508	V1509	G1510	W1511	S1512	N1513	I1514	V1515	D1516	M1520	R1523	R1524	A1528	A1529	L1530	L1533	A1534	S1535	L1537	S1538	H1539	P1540	K1541	L1542	F1543	R1544	R1545	A1546	L1555	ASN	ALA	PRO	HIS	A1561	D1564	Y1565	I1566	F1567	K1568	L1569	L1570	L1571	L1572	L1573	L1574	L1575	L1576	L1577	L1578	L1581																																				
M1582	V1583	L1584	S1585	G1588	D1589	L1590	E1591	L1592	V1593	V1594	T1595	SER	GLU	ASP	SER	LEU	ILE	LEU	SER	D1604	R1605	S1606	M1607	M1608	L1609	I1610	A1611	K1612	K1613	L1614	T1615	L1616	L1617	S1618	L1619	L1620	H1621	L1625	E1626	L1627	P1628	K1629	L1630	K1631	F1632	S1633	S1634	P1635	D1636	D1637	K1638	C1639	F1640	A1641	L1642	T1643	E1644																																					
F1645	L1646	R1647	K1648	V1649	L1654	S1655	S1656	I1657	F1658	M1659	L1660	F1663	M1664	Y1665	VAL	ASN	VAL	GLU	ASN	PRO	ARG	N1746	N1747	N1748	A1674	A1675	A1676	S1677	L1682	T1683	K1684	K1685	L1686	L1687	I1690	R1691	F1684	K1765	L1766	L1767	L1768	P1769	S1770	H1771	H1772	R1775	P1776	L1777	G1778	L1779	S1780	L1781	T1782	A1783	W1784																																							
F731	I732	P735	ARG	GLY	G738	I739	E740	G741	L742	C743	Q744	W747	T748	S751	I752	A753	I755	I756	S758	M767	S768	G772	D773	N774	Q775	T781	R782	V783	E791	K792	I795	A796	F797	C800	L807	N810	N811	G815	H816	H817	L818	K819	E820	Q821	E822																																																	
T823	I824	I825	S826	S827	H828	F829	F830	V831	R835	I836	F837	T844	Q845	A846	L847	K848	N849	A850	L855	V859	L860	G861	E862	C863	T864	Q865	S866	S867	C868	S869	N870	L871	A872	V875	M876	R877	L878	T879	E880	V883	E884	K885	D886	I887	C888	L891	Y894	M895	K898	Q899																																												
L900	S901	Y902	I905	Q908	I911	P912	G913	D914	Q915	I916	T917	L918	E919	Y920	K948	N949	A950	L930	S935	Q936	L937	L940	N941	L943	S944	C945	S946	R947	L948	F949	L871	A872	R951	N952	D955	P956	V957	V958	V961	L967	C972	N973	W976	N980	L981	K985	P986																																															
Q987	W991	A992	T993	L994	P998	Y999	S1000	I1001	M1002	Y1005	P1009	T1010	R1015	H1016	T1017	Q1018	M1022	P1028	M1029	L1030	R1031	G1032	I1033	F1034	S1035	D1036	N1043	M1044	L1045	F1048	L1049	L1050	D1051	R1052	E1053	V1054	I1055	F1056	P1057	R1058	V1059	I1062	I1063	T1067	S1068	Q1076																																																
K1088	S1089	L1090	E1091	I1092	K1093	P1094	L1095	S1096	K1099	E1102	L1103	L1104	D1105	Y1106	N1107	I1108	H1109	L1110	L1111	M1114	L1118	K1119	M1120	A1121	H1122	E1123	P1124	Y1127	L1128	K1129	A1130	L1133	E1134	T1135	C1136	S1137	W1149	A1150	P1151	L1152	L1153	R1156	G1160	L1161	E1162	D1165	E1168																																															



● Molecule 2: Phosphoprotein



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	102493	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL 3200FS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	80.8	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.091	Depositor
Minimum map value	-0.048	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.027	Depositor
Map size (Å)	403.2, 403.2, 403.2	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.12, 1.12, 1.12	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.34	0/15514	0.51	0/21035
2	B	0.33	0/575	0.55	0/776
2	C	0.31	0/588	0.49	0/794
2	D	0.31	0/575	0.54	0/776
2	E	0.33	0/588	0.49	0/794
2	F	0.27	0/375	0.42	0/498
All	All	0.34	0/18215	0.51	0/24673

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

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	15200	0	15373	724	0
2	B	569	0	600	25	0
2	C	582	0	611	21	0
2	D	569	0	600	19	0
2	E	582	0	611	27	0
2	F	374	0	414	12	0
3	A	2	0	0	0	0
All	All	17878	0	18209	785	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 22.

The worst 5 of 785 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)
1:A:410:TYR:CE1	1:A:414:HIS:HD2	1.32	1.48
1:A:1950:TRP:CE3	1:A:1956:PHE:CE1	2.16	1.33
1:A:1950:TRP:HE3	1:A:1956:PHE:CD1	1.47	1.31
1:A:410:TYR:CE1	1:A:414:HIS:CD2	2.17	1.29
1:A:1746:LEU:HB3	1:A:1748:LYS:NZ	1.50	1.25

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	A	1843/2255 (82%)	1542 (84%)	292 (16%)	9 (0%)	29	68
2	B	74/392 (19%)	74 (100%)	0	0	100	100
2	C	76/392 (19%)	76 (100%)	0	0	100	100
2	D	74/392 (19%)	74 (100%)	0	0	100	100
2	E	76/392 (19%)	76 (100%)	0	0	100	100
2	F	45/392 (12%)	43 (96%)	2 (4%)	0	100	100
All	All	2188/4215 (52%)	1885 (86%)	294 (13%)	9 (0%)	38	72

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	418	TRP
1	A	1134	GLU
1	A	1738	TRP

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Mol	Chain	Res	Type
1	A	1029	MET
1	A	1739	ILE

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	1701/2019 (84%)	1683 (99%)	18 (1%)	73	85
2	B	68/342 (20%)	67 (98%)	1 (2%)	65	80
2	C	70/342 (20%)	69 (99%)	1 (1%)	67	81
2	D	68/342 (20%)	67 (98%)	1 (2%)	65	80
2	E	70/342 (20%)	69 (99%)	1 (1%)	67	81
2	F	42/342 (12%)	42 (100%)	0	100	100
All	All	2019/3729 (54%)	1997 (99%)	22 (1%)	74	85

5 of 22 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1740	ILE
1	A	1970	ILE
1	A	1948	TYR
2	B	254	LYS
1	A	458	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 39 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2024	ASN
2	B	234	ASN
1	A	2025	GLN
1	A	2212	GLN
2	D	234	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

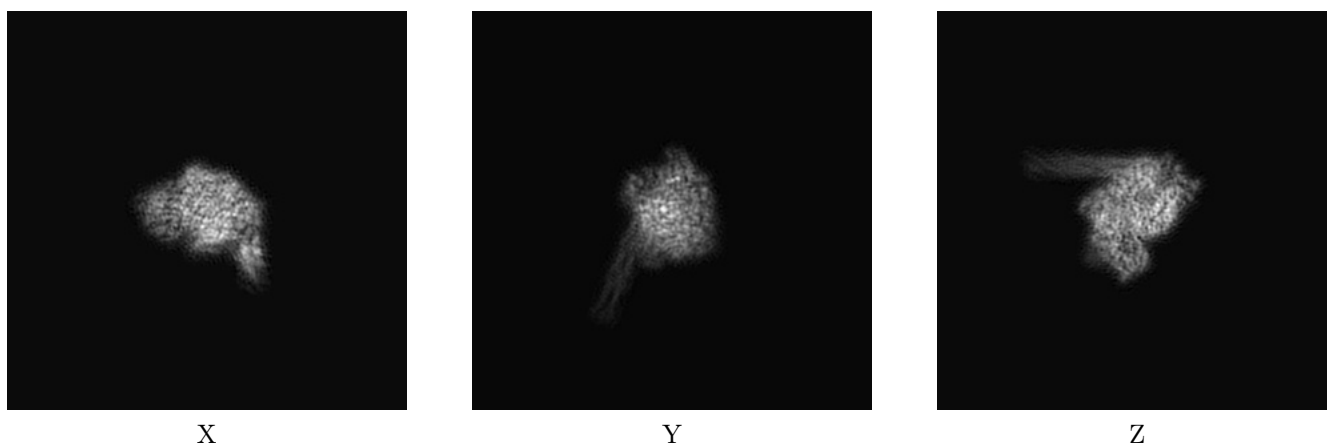
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21095. 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](#)

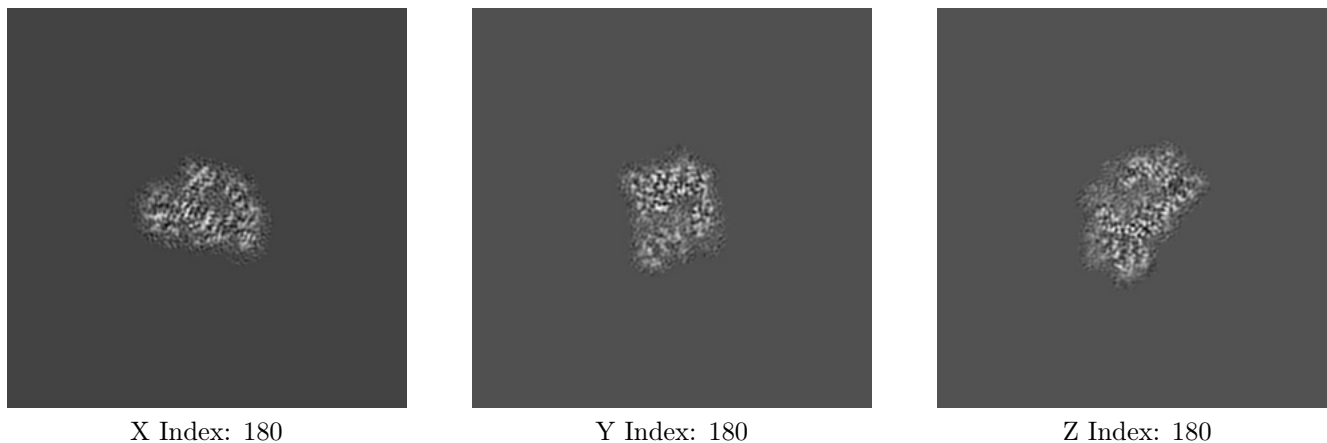
6.1.1 Primary map



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

6.2 Central slices [i](#)

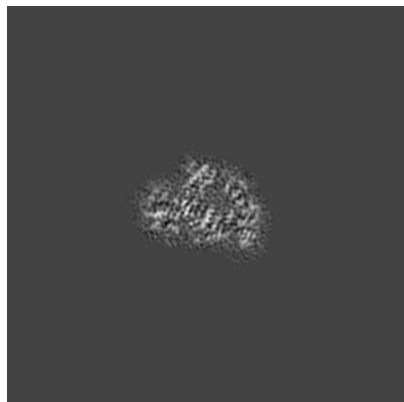
6.2.1 Primary map



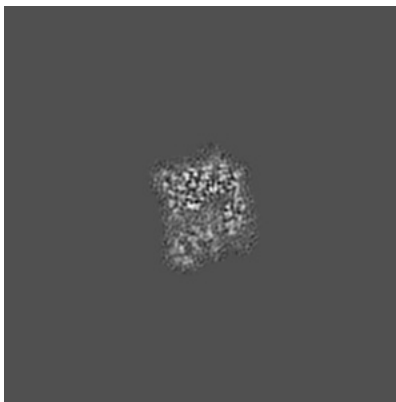
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

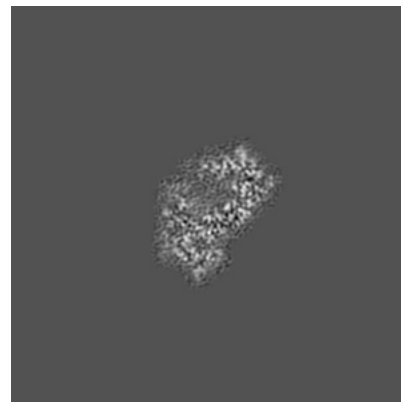
6.3.1 Primary map



X Index: 180



Y Index: 180

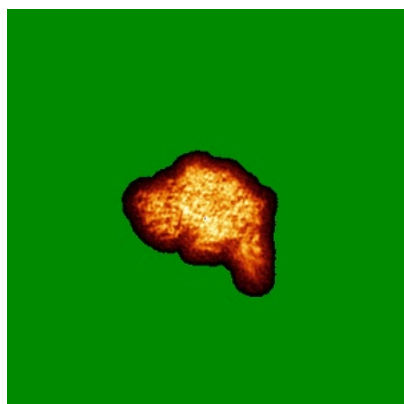


Z Index: 185

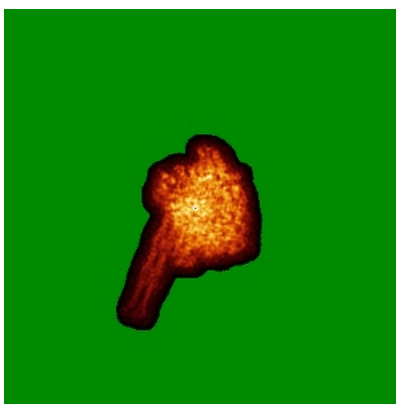
The images above show the largest variance slices of the map in three orthogonal directions.

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

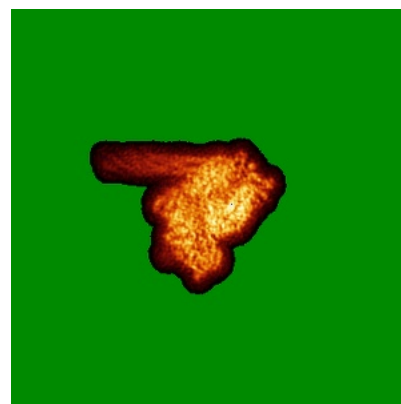
6.4.1 Primary map



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

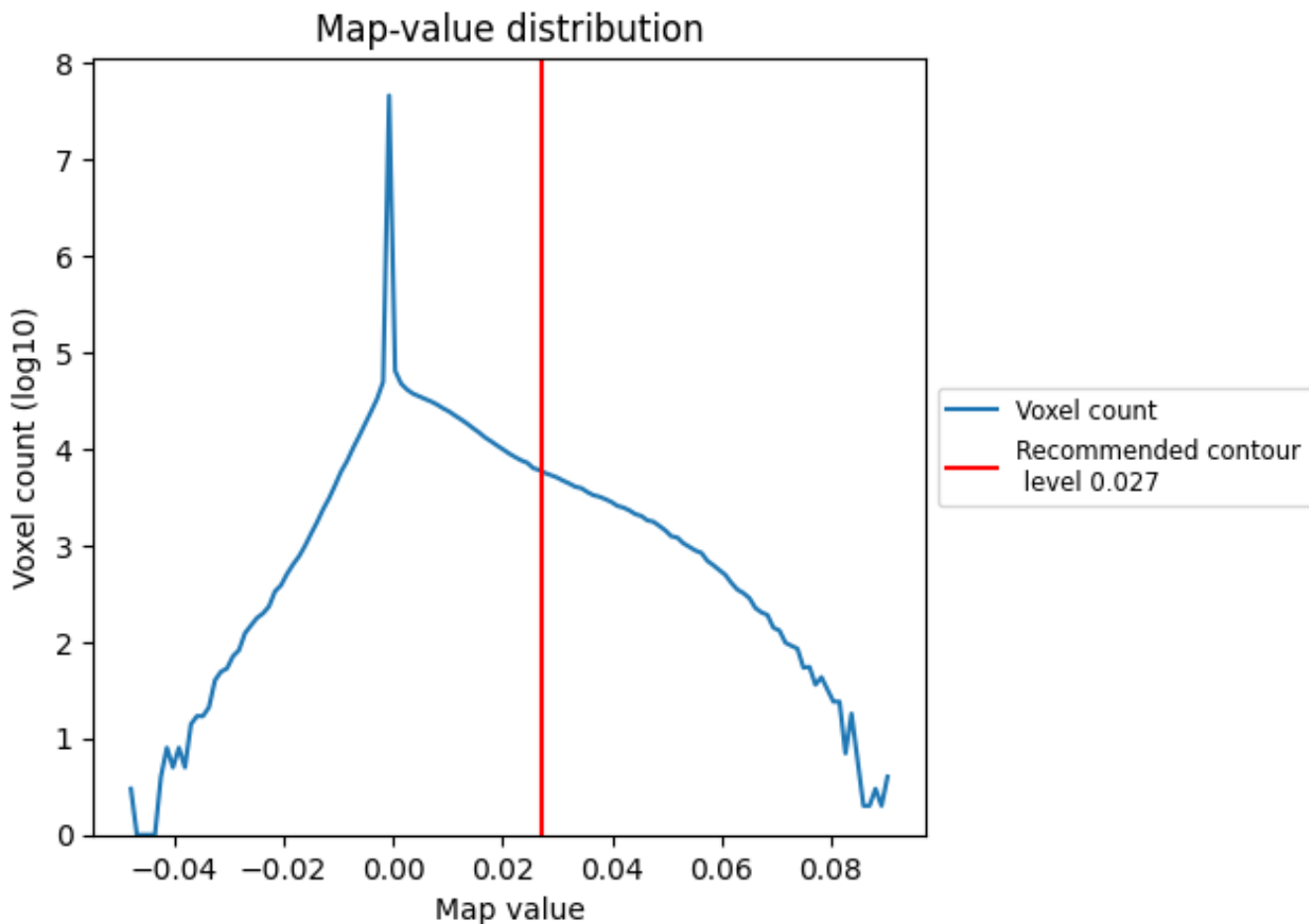
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

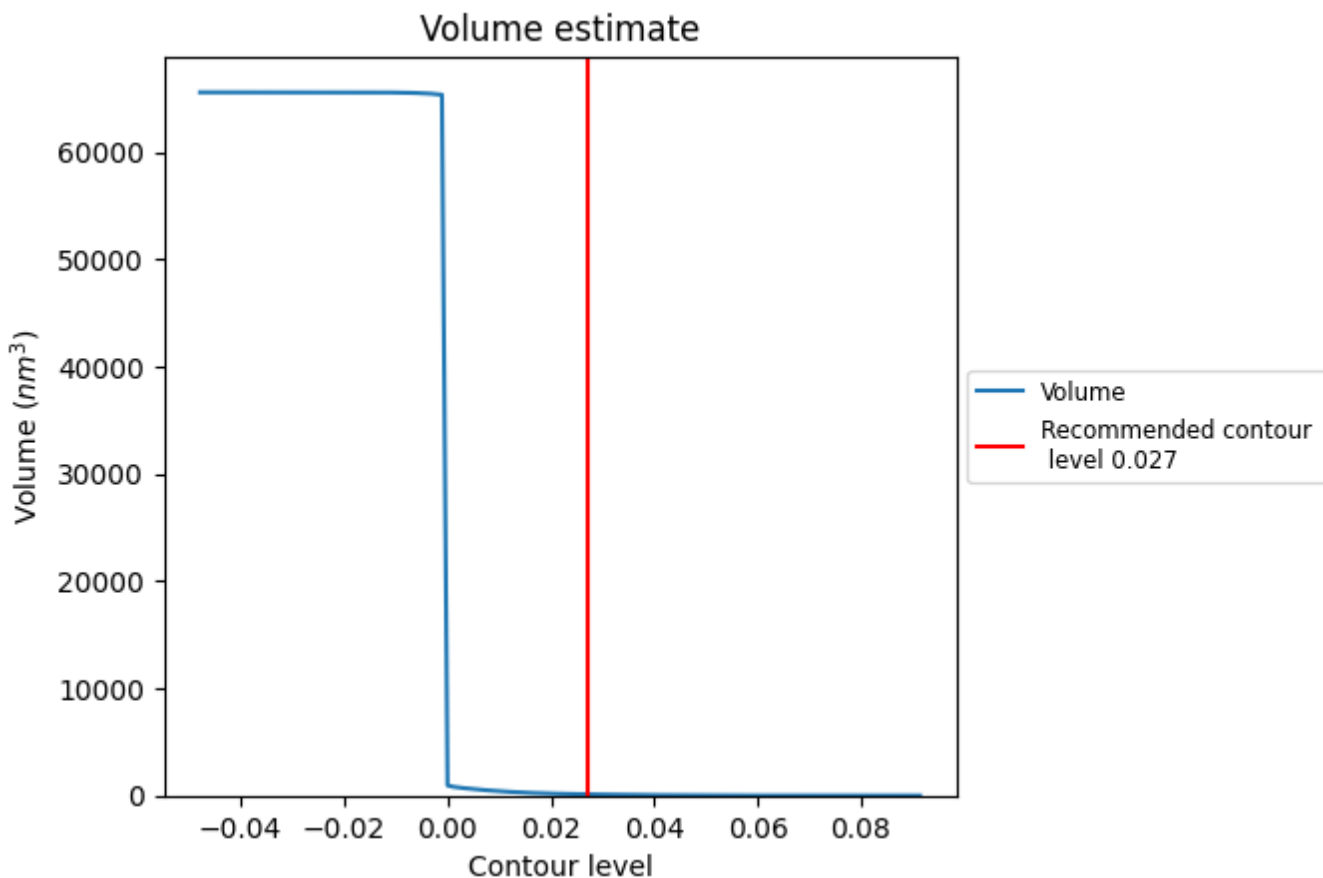
This section contains the results of statistical analysis of the map.

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.

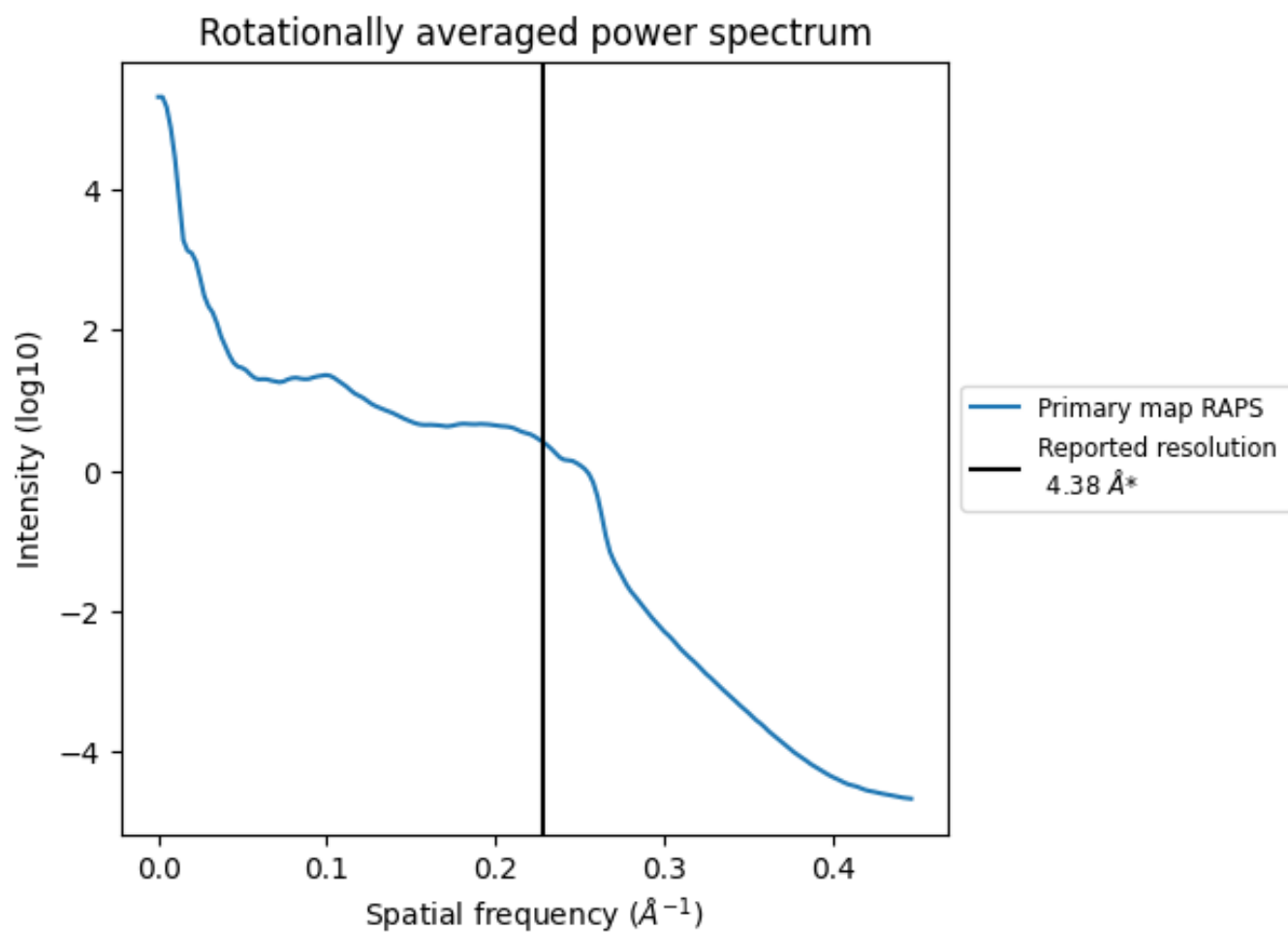
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 116 nm³; this corresponds to an approximate mass of 105 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](#)

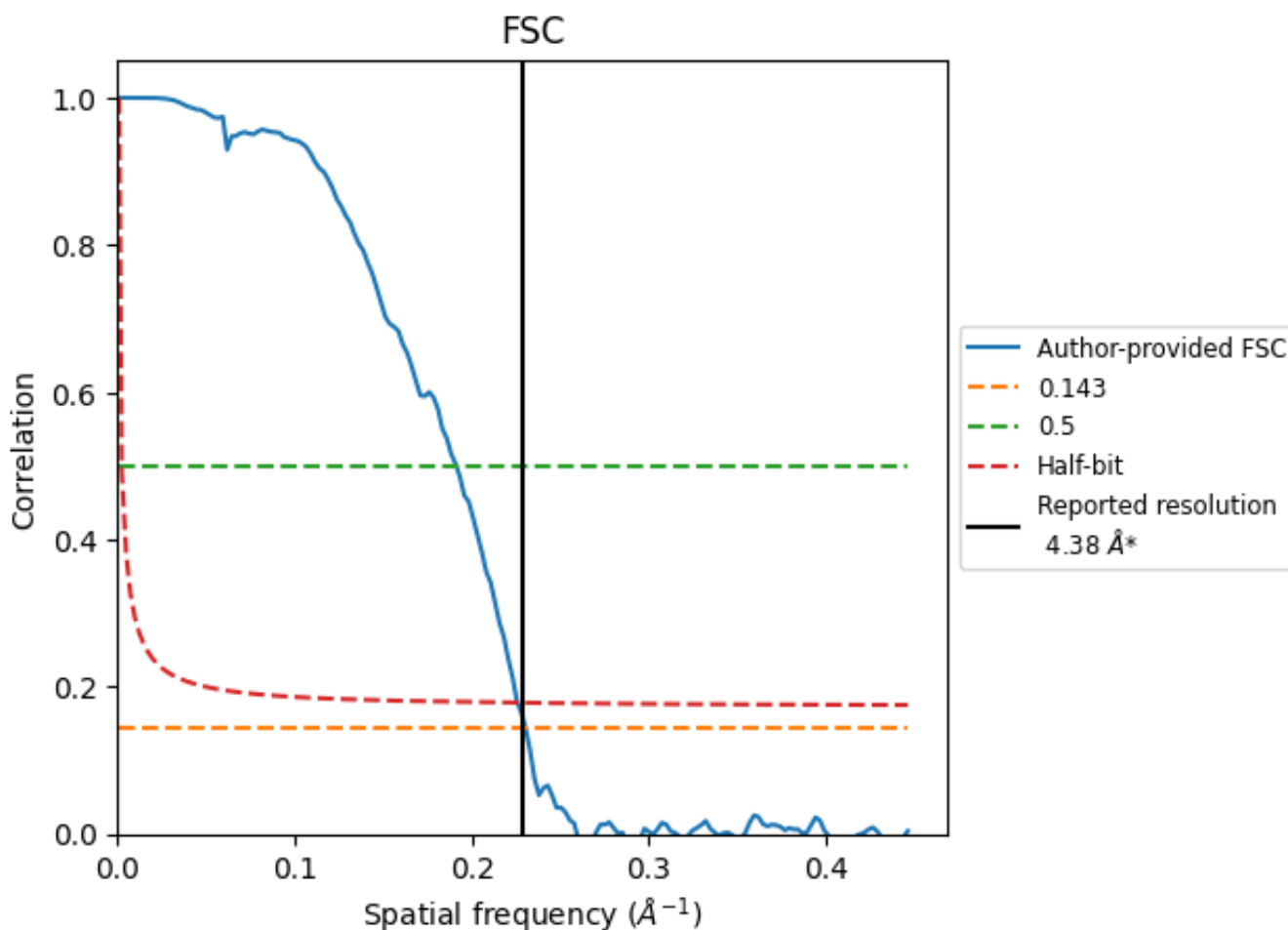


*Reported resolution corresponds to spatial frequency of 0.228\AA^{-1}

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 0.228 Å⁻¹

8.2 Resolution estimates [i](#)

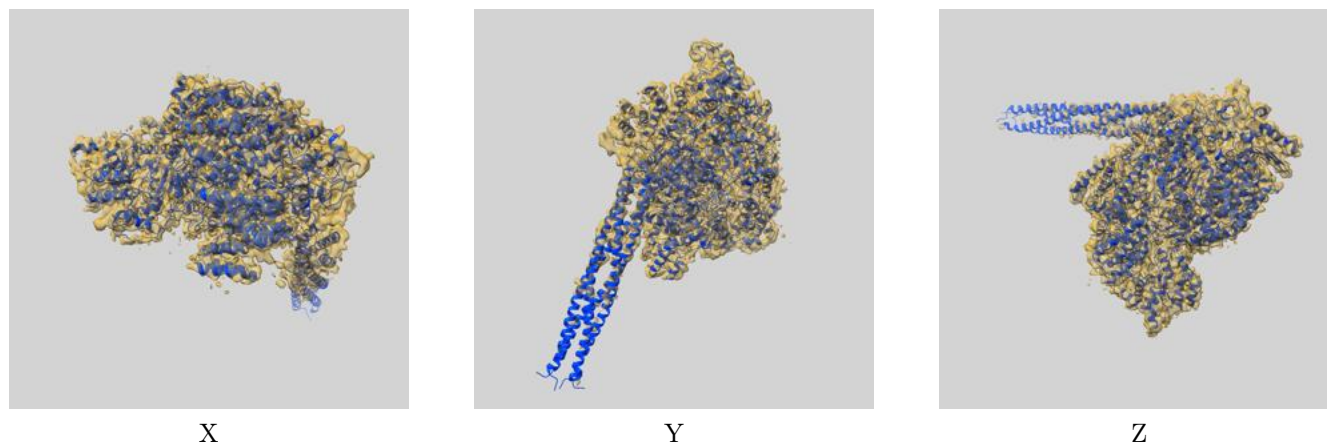
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.38	-	-
Author-provided FSC curve	4.34	5.23	4.43
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

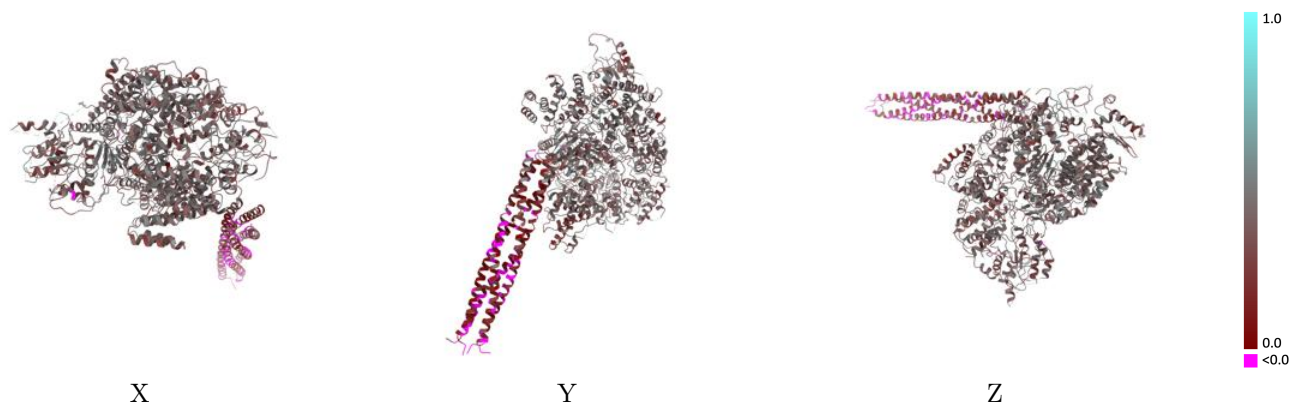
This section contains information regarding the fit between EMDB map EMD-21095 and PDB model 6V85. Per-residue inclusion information can be found in section [3](#) on page [4](#).

9.1 Map-model overlay [i](#)



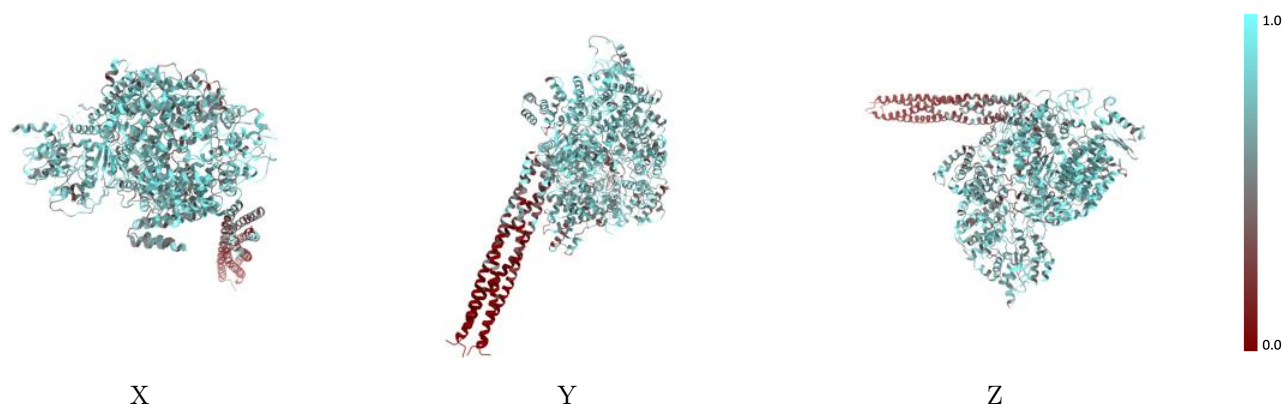
The images above show the 3D surface view of the map at the recommended contour level 0.027 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



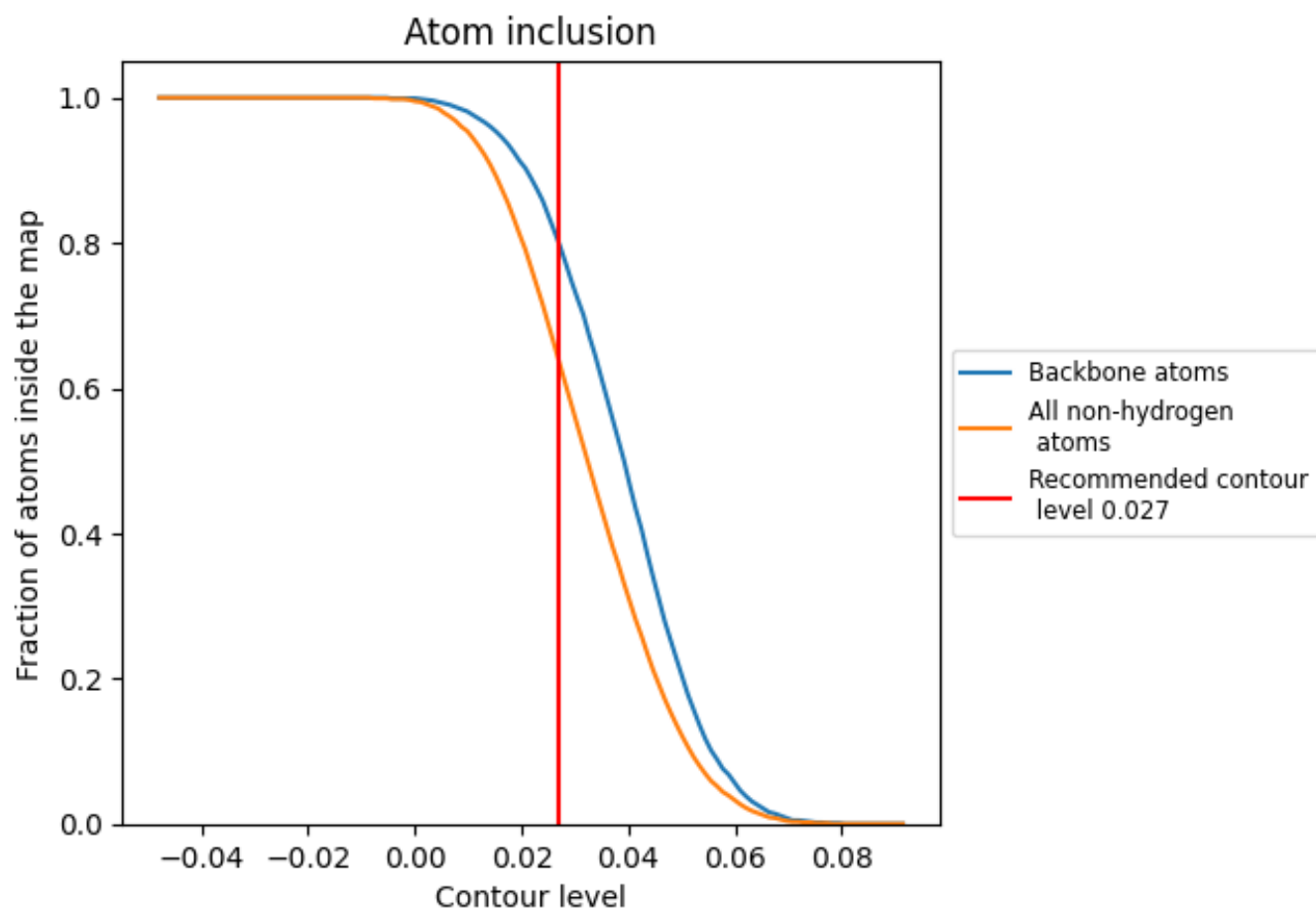
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.027).















9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 64% 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 (0.027) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6370	 0.3600
A	 0.7000	 0.3960
B	 0.1910	 0.1040
C	 0.2170	 0.0960
D	 0.1870	 0.1180
E	 0.2130	 0.1110
F	 0.6260	 0.3970

