



Full wwPDB EM Validation Report ⓘ

Jul 30, 2025 – 06:16 PM EDT

PDB ID : 8VDO / pdb_00008vdo
EMDB ID : EMD-43152
Title : Cryogenic electron microscopy model of full-length talin lacking F2, R12 and FABD.
Authors : Izard, T.; Rangarajan, E.S.
Deposited on : 2023-12-16
Resolution : 2.70 Å(reported)
Based on initial model : 6r9t

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

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

A user guide is available at

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

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev126
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.45.1

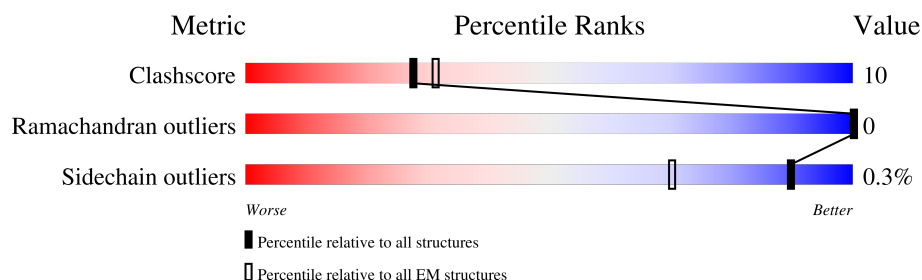
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.70 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	2804	5% 49% 13% 38%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 12691 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 Green fluorescent protein, Talin-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1740	Total	C	N	O	S	3	0
			12691	7794	2267	2568	62		

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-262	MET	-	expression tag	UNP A0A9X4KGN5
A	-261	HIS	-	expression tag	UNP A0A9X4KGN5
A	-260	HIS	-	expression tag	UNP A0A9X4KGN5
A	-259	HIS	-	expression tag	UNP A0A9X4KGN5
A	-258	HIS	-	expression tag	UNP A0A9X4KGN5
A	-257	HIS	-	expression tag	UNP A0A9X4KGN5
A	-256	HIS	-	expression tag	UNP A0A9X4KGN5
A	-255	HIS	-	expression tag	UNP A0A9X4KGN5
A	-254	HIS	-	expression tag	UNP A0A9X4KGN5
A	-253	HIS	-	expression tag	UNP A0A9X4KGN5
A	-252	HIS	-	expression tag	UNP A0A9X4KGN5
A	-12	GLY	-	linker	UNP A0A9X4KGN5
A	-11	SER	-	linker	UNP A0A9X4KGN5
A	-10	LEU	-	linker	UNP A0A9X4KGN5
A	-9	GLU	-	linker	UNP A0A9X4KGN5
A	-8	VAL	-	linker	UNP A0A9X4KGN5
A	-7	LEU	-	linker	UNP A0A9X4KGN5
A	-6	PHE	-	linker	UNP A0A9X4KGN5
A	-5	GLN	-	linker	UNP A0A9X4KGN5
A	-4	GLY	-	linker	UNP A0A9X4KGN5
A	-3	PRO	-	linker	UNP A0A9X4KGN5
A	-2	ALA	-	linker	UNP A0A9X4KGN5
A	-1	ALA	-	linker	UNP A0A9X4KGN5
A	0	ALA	-	linker	UNP A0A9X4KGN5
A	639	LEU	GLN	conflict	UNP P26039
A	673	ASN	LYS	conflict	UNP P26039
A	1227	LEU	SER	conflict	UNP P26039
A	2349	VAL	ALA	conflict	UNP P26039

V2111	R1919	K2021	P487	M669	L778	E892	K1068	M1211	R1298	Q1442	L1607	Q1758	R1919	K2021	V2111
V2112	V1920	K2024	L488	Q670	L781	A893	A1069	R1214	A1299	A1443	A1610	M1759	Q1921	V2025	V2112
T2126	V1921	V2025	Q492	L671	L781	A904	L1079	A1215	Q1300	A1444	A1760	L1761	Q1921	V2026	T2126
L2129	S1928	V2027	S502	V675	H784	1909	E1082	G1217	V1301	Y1445	L1613	K1766	S1928	V2027	L2129
K2133	V1944	E2028	V606	A678	K766	P942	T1083	D1218	L1335	V1447	I1614	K1766	V1944	E2028	K2133
A2134	Y1945	D2029	Q507	A679	A787	K943	M1084	K1221	R1340	Q1472	R1618	N1785	Y1945	D2029	A2134
V2135	T2030	T2030	A508	L682	A788	A944	S1094	R1222	T1343	M1476	R1791	Q1788	T2030	T2030	V2135
GLU	K1947	K2031	A509	V683	A789	S945	T1095	L1223	M1347	M1476	A1621	Q1788	K1947	K2031	GLU
ASP	E1949	V2032	Q510	L698	G791	A946	V1098	L1224	N1347	Q1472	A1621	H1791	E1949	V2032	ASP
ALA	L1950	L2033	A511	V702	A792	G947	S1225	S1225	T1351	G1482	P1624	E1798	L1950	L2033	ALA
THR	E1952	Q2035	T512	A705	G793	P948	K1104	D1226	Q1362	E1483	R1625	E1798	E1952	Q2035	THR
LYS	A2045	A2045	E517	T713	P794	Q954	L1105	L1227	T1364	P1484	P1628	E1798	A2045	A2045	LYS
GLY	A2048	A2048	S528	S714	A795	K957	E1108	L1228	Q1355	G1485	L1633	M1802	A2048	A2048	GLY
THR	Q2049	Q2049	K529	T716	G796	A958	I1109	L1229	Q1356	T1486	L1634	V1807	Q2049	Q2049	THR
ARG	V2052	V2052	K533	L716	R797	E961	A1120	P1230	A1357	Q1488	G1635	V1807	A1967	V2052	ARG
LEU	L2055	L2055	V547	L717	T804	E961	V1124	P1231	P1358	Q1489	R1638	V1828	L1968	L2055	LEU
ALA	L2059	L2059	I550	A718	T806	V970	R1129	T1232	P1358	Q1490	T1639	T1832	G1971	L2059	ALA
THR	D2060	D2060	V577	C719	T807	S973	R1129	G1233	E1362	V1491	V1640	T1832	L1971	D2060	THR
GLU	K2063	K2063	V588	T720	V808	Q974	A1132	T1234	E1364	L1492	S1643	T1835	T1975	K2063	GLU
VAL	L2064	L2064	D569	K721	V808	Q974	A1132	F1235	N1365	C1509	I1644	T1835	V1985	L2064	VAL
PHE	Q2065	Q2065	V573	V722	T804	Q974	A1132	Q1236	A1366	C1509	I1644	T1835	V1985	Q2065	PHE
CYS	G2065	G2065	G574	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	G2065	CYS
PRO	L2067	L2067	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	L2067	PRO
GLU	S2068	S2068	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	S2068	GLU
ALA	L2069	L2069	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	L2069	ALA
THR	Q2070	Q2070	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	Q2070	THR
SER	A2071	A2071	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	A2071	SER
PRO	E2072	E2072	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	E2072	PRO
GLU	D2073	D2073	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	D2073	GLU
PRO	P2074	P2074	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	P2074	PRO
ALA	E2075	E2075	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	E2075	ALA
LYS	Q2077	Q2077	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	Q2077	LYS
SER	L2081	L2081	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	L2081	SER
PRO	V2084	V2084	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	V2084	PRO
GLU	K2085	K2085	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	K2085	GLU
ASP	D2086	D2086	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	D2086	ASP
PHE	L2091	L2091	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	L2091	PHE
ILE	K2099	K2099	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	K2099	ILE
ARG	V2104	V2104	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	V2104	ARG
THR	G2106	G2106	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	G2106	THR
LYS	D2107	D2107	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	D2107	LYS
GLY	D2108	D2108	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	D2108	GLY
ILE	G2109	G2109	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	G2109	ILE
THR	A2110	A2110	V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985	A2110	THR
ALA			V577	V722	T804	Q974	A1132	E1237	A1366	C1509	I1644	T1835	V1985		ALA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	439156	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	48	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.117	Depositor
Minimum map value	-2.423	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.040	Depositor
Recommended contour level	0.218	Depositor
Map size ($\text{\AA}$)	368.63998, 368.63998, 368.63998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.152, 1.152, 1.152	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	0.23	0/12823	0.44	0/17391

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	12691	0	12828	243	0
All	All	12691	0	12828	243	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (243) 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:2055:ILE:HG13	1:A:2091:LEU:HD22	1.46	0.97
1:A:377:TYR:HE2	1:A:379:SER:HB3	1.52	0.75
1:A:1223:LEU:HB3	1:A:1286:VAL:HG11	1.68	0.74
1:A:1211:ASN:OD1	1:A:1214:ARG:NH1	2.20	0.74
1:A:1250:ASN:ND2	1:A:1371:GLU:OE1	2.20	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1168:GLU:OE2	1:A:1184:ARG:NH1	2.20	0.73
1:A:2031:LYS:O	1:A:2035:GLN:NE2	2.23	0.71
1:A:1363:CYS:HB2	1:A:1618:ARG:HH21	1.56	0.70
1:A:1394:ASP:O	1:A:1398:GLU:HG2	1.93	0.69
1:A:1857:MET:HE3	1:A:1968:LEU:HD21	1.75	0.69
1:A:358:ARG:HB2	1:A:369:ASP:HB3	1.74	0.68
1:A:1354:THR:HB	1:A:1361:LYS:HD3	1.75	0.68
1:A:1067:ILE:HD13	1:A:1136[A]:ARG:HG3	1.77	0.67
1:A:1347:ASN:ND2	1:A:1369:GLN:OE1	2.27	0.67
1:A:339:ARG:HH21	1:A:349:GLN:HE21	1.42	0.67
1:A:943:LYS:HB2	1:A:1012:GLN:HB2	1.77	0.67
1:A:1472:GLN:HG2	1:A:1476:MET:HE2	1.79	0.65
1:A:1365:ASN:OD1	1:A:1368:ARG:NH2	2.30	0.64
1:A:370:PHE:HE2	1:A:374:GLN:HG2	1.60	0.64
1:A:1838:LEU:HD23	1:A:1921:GLN:HG3	1.80	0.64
1:A:621:GLU:OE1	1:A:624:ARG:NH2	2.33	0.61
1:A:1382:GLN:HG3	1:A:1383:PRO:HD2	1.82	0.61
1:A:1245:ALA:HB1	1:A:1281:PHE:HA	1.82	0.61
1:A:1640:VAL:O	1:A:1644:ILE:HD12	2.00	0.61
1:A:781:LEU:HA	1:A:784:HIS:CE1	2.36	0.61
1:A:357:LYS:HG3	1:A:358:ARG:HG3	1.81	0.61
1:A:1269:ARG:HH11	1:A:1273:ARG:HH12	1.48	0.61
1:A:863:LEU:O	1:A:867:THR:HG23	2.02	0.60
1:A:1292:ALA:HB3	1:A:1298:ARG:HB3	1.84	0.60
1:A:1108:GLU:OE2	1:A:1523:ARG:NH2	2.35	0.59
1:A:1095:THR:HG23	1:A:1196:LEU:HB3	1.84	0.59
1:A:1640:VAL:O	1:A:1643:SER:OG	2.20	0.59
1:A:1733:GLN:O	1:A:1736:GLN:HG2	2.01	0.59
1:A:664:PHE:CE1	1:A:787:ALA:HB2	2.38	0.59
1:A:1054:LEU:HB3	1:A:1058:GLN:HE22	1.67	0.59
1:A:847:GLU:HG2	1:A:852:ASN:HB3	1.84	0.58
1:A:1340:ARG:NH2	1:A:1438:GLU:OE2	2.36	0.58
1:A:1385:ASN:HB2	1:A:1442:GLN:OE1	2.04	0.58
1:A:970:VAL:O	1:A:974:GLN:HG3	2.03	0.58
1:A:778:LEU:HD13	1:A:1945:TYR:CG	2.38	0.58
1:A:1256:LEU:HD23	1:A:1335:LEU:HD21	1.86	0.58
1:A:1370:LEU:HD22	1:A:1607:LEU:HD11	1.84	0.58
1:A:664:PHE:CE2	1:A:727:ILE:HG21	2.39	0.57
1:A:716:LEU:HD22	1:A:743:VAL:HG21	1.86	0.57
1:A:322:LYS:HE2	1:A:1802:MET:HE3	1.87	0.56
1:A:377:TYR:CE2	1:A:379:SER:HB3	2.37	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:558:VAL:O	1:A:634:ARG:NH2	2.37	0.56
1:A:847:GLU:OE1	1:A:852:ASN:ND2	2.38	0.56
1:A:1481:LEU:HD23	1:A:1558:CYS:SG	2.46	0.56
1:A:1892:ASP:OD2	1:A:1895:ARG:NH2	2.33	0.56
1:A:600:ASP:O	1:A:601:GLU:HG2	2.06	0.56
1:A:1063:ASP:O	1:A:1067:ILE:HG13	2.05	0.56
1:A:586:GLU:OE1	1:A:589[A]:ARG:NH2	2.39	0.56
1:A:1509:CYS:SG	1:A:1572:LEU:HD11	2.45	0.56
1:A:2018:GLY:HA2	1:A:2021:LYS:HE3	1.87	0.56
1:A:790:THR:HG23	1:A:791:GLY:H	1.71	0.55
1:A:943:LYS:HE2	1:A:1011:ILE:HG23	1.88	0.55
1:A:1865:ALA:HB2	1:A:1961:VAL:HG11	1.87	0.55
1:A:1084:MET:HE1	1:A:1138:VAL:HG13	1.89	0.55
1:A:377:TYR:OH	1:A:1766:LYS:NZ	2.29	0.54
1:A:747:VAL:O	1:A:751:VAL:HG23	2.07	0.54
1:A:1104:LYS:HD2	1:A:1520:THR:HG22	1.88	0.54
1:A:1785:ASN:HB3	1:A:1788:GLN:HG2	1.87	0.54
1:A:806:LEU:HD12	1:A:909:ILE:HG23	1.89	0.54
1:A:679:ALA:CB	1:A:713:THR:HG21	2.38	0.54
1:A:1004:ALA:O	1:A:1008:VAL:HG23	2.08	0.54
1:A:337:VAL:HG13	1:A:351:TRP:HE3	1.74	0.53
1:A:1975:THR:HG23	1:A:2099:LYS:HG3	1.90	0.53
1:A:1060:LEU:HD21	1:A:1129:ARG:HG3	1.90	0.53
1:A:356:ILE:HG21	1:A:368:LEU:HD21	1.91	0.53
1:A:1828:VAL:HG13	1:A:1928:SER:HB2	1.91	0.53
1:A:339:ARG:HH21	1:A:349:GLN:NE2	2.07	0.53
1:A:705:ALA:HB1	1:A:750:CYS:HA	1.91	0.52
1:A:804:THR:O	1:A:808:VAL:HG22	2.09	0.52
1:A:678:ALA:HB1	1:A:772:THR:HG23	1.91	0.52
1:A:1273:ARG:O	1:A:1276:GLN:HG2	2.10	0.52
1:A:2005:ASN:O	1:A:2006:ARG:NE	2.38	0.52
1:A:1233:GLY:O	1:A:1291:GLN:NE2	2.43	0.52
1:A:2012:PHE:O	1:A:2016:ARG:NH1	2.42	0.51
1:A:1228:LEU:HG	1:A:1230:PRO:HG2	1.92	0.51
1:A:506:VAL:O	1:A:510:GLN:HG3	2.10	0.51
1:A:322:LYS:HE2	1:A:1802:MET:HG2	1.93	0.51
1:A:1235:PHE:O	1:A:1239:GLN:HG2	2.11	0.51
1:A:1947:LYS:O	1:A:1951:ILE:HG12	2.11	0.51
1:A:488:LEU:HD23	1:A:492:GLN:HB3	1.94	0.50
1:A:517:GLU:HG3	1:A:592:LYS:HB3	1.93	0.50
1:A:547:VAL:HG13	1:A:648:SER:HB2	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:823:VAL:O	1:A:827:ARG:HG2	2.10	0.50
1:A:1901:LYS:HB3	1:A:1902:PRO:HD3	1.93	0.50
1:A:947:GLY:HA2	1:A:1736:GLN:OE1	2.12	0.50
1:A:671:LEU:O	1:A:675:VAL:HG23	2.12	0.49
1:A:797:ARG:NH2	1:A:843:ASP:OD1	2.45	0.49
1:A:1482:GLY:HA2	1:A:1559:ARG:HG2	1.93	0.49
1:A:1120:ALA:O	1:A:1124:VAL:HG23	2.13	0.49
1:A:1491:VAL:HG11	1:A:1546:LEU:HD23	1.95	0.49
1:A:529:LYS:O	1:A:533:LYS:HG2	2.11	0.49
1:A:781:LEU:O	1:A:785:VAL:HG23	2.13	0.49
1:A:943:LYS:HD3	1:A:1012:GLN:H	1.76	0.49
1:A:1370:LEU:HA	1:A:1373:VAL:HG12	1.95	0.49
1:A:508:ALA:O	1:A:512:THR:HG23	2.13	0.49
1:A:723:VAL:HB	1:A:732:CYS:HB3	1.94	0.49
1:A:1444:ALA:O	1:A:1596:MET:HG2	2.13	0.49
1:A:1952:GLU:OE2	1:A:1955:ARG:NE	2.42	0.49
1:A:1064:LEU:HD21	1:A:1132:ALA:HB1	1.95	0.49
1:A:1208:ASP:HB2	1:A:1268:ALA:HB1	1.95	0.49
1:A:1528:SER:HB3	1:A:1572:LEU:HD12	1.95	0.49
1:A:377:TYR:HE1	1:A:1676:ASP:HA	1.78	0.48
1:A:1945:TYR:O	1:A:1949:GLU:HG3	2.13	0.48
1:A:319:MET:HB2	1:A:322:LYS:HB2	1.94	0.48
1:A:958:ALA:O	1:A:961:GLU:HG3	2.13	0.48
1:A:1988:ILE:HD13	1:A:2055:ILE:HG22	1.95	0.48
1:A:1105:LEU:O	1:A:1109:ILE:HG12	2.13	0.48
1:A:1702:MET:HE1	1:A:1761:LEU:HD22	1.95	0.48
1:A:1559:ARG:O	1:A:1562:THR:HG22	2.13	0.48
1:A:1356:GLN:HG2	1:A:1357:ALA:H	1.77	0.48
1:A:1853:TYR:HB3	1:A:1903:ALA:HB2	1.95	0.48
1:A:778:LEU:HD22	1:A:1945:TYR:CE1	2.49	0.47
1:A:1561:ALA:O	1:A:1564:PRO:HD2	2.14	0.47
1:A:1635:GLY:O	1:A:1638:ARG:HG3	2.13	0.47
1:A:502:SER:O	1:A:506:VAL:HG23	2.14	0.47
1:A:1068:LYS:HG2	1:A:1152:LEU:HD13	1.96	0.47
1:A:1351:THR:OG1	1:A:1365:ASN:ND2	2.47	0.47
1:A:1836:ASN:O	1:A:1840:GLU:HG2	2.14	0.47
1:A:1610:ALA:O	1:A:1614:ILE:HG12	2.14	0.47
1:A:1710:SER:HB2	1:A:1807:VAL:HG11	1.97	0.47
1:A:1919:ARG:HG3	1:A:1967:ALA:HB2	1.96	0.47
1:A:357:LYS:NZ	1:A:370:PHE:O	2.45	0.47
1:A:2077:GLN:O	1:A:2081:ILE:HG13	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:550:ILE:HG23	1:A:580:ILE:HG23	1.96	0.47
1:A:821:GLU:OE1	1:A:824:ARG:NH1	2.48	0.47
1:A:1443:ALA:CB	1:A:1651:MET:HE3	2.45	0.47
1:A:1915:HIS:O	1:A:1919:ARG:HG2	2.15	0.47
1:A:1992:LEU:HD23	1:A:2063:LYS:HZ1	1.80	0.47
1:A:1154:THR:O	1:A:1158:VAL:HG23	2.15	0.46
1:A:1638:ARG:HD2	1:A:1639:THR:N	2.30	0.46
1:A:574:GLY:HA2	1:A:577:VAL:HG22	1.95	0.46
1:A:669:MET:HE1	1:A:720:THR:HG22	1.97	0.46
1:A:1443:ALA:HB1	1:A:1651:MET:HE3	1.97	0.46
1:A:1383:PRO:HD3	1:A:1445:TYR:CZ	2.50	0.46
1:A:1396:VAL:HG13	1:A:1436:PHE:CE1	2.51	0.46
1:A:1443:ALA:O	1:A:1447:VAL:HG23	2.16	0.46
1:A:1682:ALA:HB3	1:A:1759:MET:HE2	1.96	0.46
1:A:1911:GLU:O	1:A:1915:HIS:ND1	2.44	0.46
1:A:2029:ASP:HA	1:A:2032:VAL:HG22	1.97	0.46
1:A:1188:VAL:O	1:A:1192:VAL:HG23	2.16	0.46
1:A:315:VAL:HG12	1:A:382:THR:HB	1.98	0.45
1:A:755:GLN:OE1	1:A:763:LEU:HD12	2.17	0.45
1:A:859:ALA:HB1	1:A:904:ALA:HA	1.99	0.45
1:A:1082:GLU:OE1	1:A:1136[B]:ARG:NH2	2.49	0.45
1:A:1716:LEU:HD11	1:A:1731:VAL:HG12	1.97	0.45
1:A:698:LEU:O	1:A:702:VAL:HG23	2.16	0.45
1:A:1068:LYS:HE3	1:A:1068:LYS:HB3	1.82	0.45
1:A:569:ASP:OD2	1:A:1693:ILE:HA	2.16	0.45
1:A:723:VAL:HG21	1:A:736:LEU:HG	1.99	0.45
1:A:1592:GLY:O	1:A:1596:MET:HG3	2.17	0.45
1:A:1985:VAL:HG11	1:A:2091:LEU:HD23	1.98	0.45
1:A:349:GLN:OE1	1:A:351:TRP:NE1	2.46	0.45
1:A:356:ILE:HD12	1:A:368:LEU:HD11	1.99	0.45
1:A:2030:THR:O	1:A:2034:VAL:HG23	2.16	0.45
1:A:844:ALA:HB2	1:A:856:LEU:HB3	1.98	0.45
1:A:870:MET:HA	1:A:893:ALA:HB1	1.99	0.45
1:A:1343:THR:HG21	1:A:1372:THR:OG1	2.16	0.44
1:A:1730:LYS:HA	1:A:1730:LYS:HD3	1.79	0.44
1:A:368:LEU:O	1:A:377:TYR:HB2	2.17	0.44
1:A:1358:PRO:HB2	1:A:1419:LEU:HB3	1.99	0.44
1:A:2126:THR:HA	1:A:2129:LEU:HD12	1.98	0.44
1:A:718:ALA:O	1:A:722:VAL:HG23	2.17	0.44
1:A:997:GLY:O	1:A:1001:VAL:HG23	2.17	0.44
1:A:1992:LEU:HD23	1:A:2063:LYS:NZ	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1067:ILE:HD13	1:A:1136[B]:ARG:HG3	2.00	0.44
1:A:1850:PHE:CE2	1:A:1971:GLY:HA3	2.52	0.44
1:A:2069:LEU:HD13	1:A:2076:THR:HG22	2.00	0.44
1:A:990:SER:O	1:A:994:LEU:HG	2.18	0.44
1:A:1366:ALA:O	1:A:1370:LEU:HG	2.17	0.44
1:A:2021:LYS:O	1:A:2025:VAL:HG23	2.18	0.44
1:A:772:THR:O	1:A:776:GLN:NE2	2.50	0.44
1:A:2024:LYS:O	1:A:2027:VAL:HG22	2.18	0.44
1:A:356:ILE:HA	1:A:370:PHE:HB3	1.99	0.44
1:A:1094:SER:O	1:A:1098:VAL:HG23	2.17	0.44
1:A:1613:LEU:HD12	1:A:1633:LEU:HD12	2.00	0.44
1:A:569:ASP:O	1:A:573:VAL:HG23	2.18	0.44
1:A:1564:PRO:O	1:A:1567:GLU:HG3	2.17	0.44
1:A:1944:VAL:O	1:A:1948:LYS:HG2	2.18	0.44
1:A:2007:GLU:O	1:A:2007:GLU:HG2	2.18	0.44
1:A:355:ASN:C	1:A:355:ASN:HD22	2.26	0.43
1:A:1216:VAL:HG22	1:A:1278:PHE:CD2	2.52	0.43
1:A:2027:VAL:O	1:A:2031:LYS:HG2	2.18	0.43
1:A:1421:GLU:HA	1:A:1424:ASP:OD2	2.18	0.43
1:A:1751:LYS:HA	1:A:1751:LYS:HD2	1.82	0.43
1:A:328:ARG:HD3	1:A:328:ARG:HA	1.87	0.43
1:A:667:VAL:O	1:A:670:GLN:HG3	2.19	0.43
1:A:736:LEU:HA	1:A:736:LEU:HD23	1.77	0.43
1:A:1269:ARG:NH1	1:A:1273:ARG:HH22	2.17	0.43
1:A:2005:ASN:HB3	1:A:2067:ALA:HA	2.01	0.43
1:A:322:LYS:NZ	1:A:1802:MET:HG2	2.32	0.43
1:A:759:GLU:O	1:A:763:LEU:HD23	2.18	0.43
1:A:2027:VAL:HA	1:A:2030:THR:HG22	1.99	0.43
1:A:1668:LEU:HD23	1:A:1668:LEU:HA	1.75	0.43
1:A:1229:PRO:N	1:A:1230:PRO:HD2	2.33	0.43
1:A:1363:CYS:HB2	1:A:1618:ARG:NH2	2.29	0.43
1:A:980:PRO:O	1:A:984:LEU:HD23	2.19	0.42
1:A:954:GLN:HA	1:A:957:LYS:HE3	2.02	0.42
1:A:973:SER:HA	1:A:982:ALA:HB1	2.01	0.42
1:A:1361:LYS:HE3	1:A:1361:LYS:HB2	1.74	0.42
1:A:1079:LEU:HD12	1:A:1136[B]:ARG:NH2	2.34	0.42
1:A:1727:LEU:O	1:A:1731:VAL:HG13	2.20	0.42
1:A:1755:HIS:HA	1:A:1758:GLN:HG2	2.02	0.42
1:A:714:SER:O	1:A:717:VAL:HG22	2.20	0.42
1:A:769:ALA:O	1:A:772:THR:HG22	2.20	0.42
1:A:2081:ILE:O	1:A:2084:VAL:HG12	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:528:SER:HA	1:A:1079:LEU:HD21	2.02	0.41
1:A:1297:ASP:O	1:A:1301:VAL:HG23	2.20	0.41
1:A:1551:THR:HG23	1:A:1554:ASN:H	1.85	0.41
1:A:1832:THR:HA	1:A:1835:ILE:HD12	2.02	0.41
1:A:2073:ASP:OD1	1:A:2073:ASP:N	2.51	0.41
1:A:312:PHE:HB3	1:A:329:LEU:HD22	2.02	0.41
1:A:322:LYS:CE	1:A:1802:MET:HG2	2.50	0.41
1:A:948:PRO:HD3	1:A:1736:GLN:NE2	2.35	0.41
1:A:2048:ALA:O	1:A:2052:VAL:HG23	2.20	0.41
1:A:719:CYS:O	1:A:723:VAL:HG22	2.21	0.41
1:A:1060:LEU:O	1:A:1064:LEU:HD23	2.20	0.41
1:A:2015:HIS:O	1:A:2019:ILE:HG13	2.21	0.41
1:A:880:HIS:HB2	1:A:886:GLN:HG3	2.03	0.41
1:A:1728:GLY:HA2	1:A:1731:VAL:HG22	2.03	0.41
1:A:1747:GLY:O	1:A:1750:SER:OG	2.29	0.41
1:A:661:ASP:OD1	1:A:661:ASP:N	2.54	0.41
1:A:1798:GLU:O	1:A:1802:MET:HG3	2.20	0.41
1:A:682:LEU:HD22	1:A:770:ALA:HA	2.03	0.41
1:A:744:ALA:O	1:A:747:VAL:N	2.54	0.41
1:A:1295:GLN:HA	1:A:1298:ARG:CZ	2.51	0.41
1:A:2045:ALA:C	1:A:2049:GLN:HE21	2.29	0.41
1:A:751:VAL:O	1:A:755:GLN:HG2	2.21	0.40
1:A:1232:THR:O	1:A:1291:GLN:NE2	2.54	0.40
1:A:2059:ALA:O	1:A:2063:LYS:HG3	2.21	0.40
1:A:330:LEU:HD23	1:A:388:ILE:HD11	2.04	0.40
1:A:1144:ASP:OD1	1:A:1144:ASP:N	2.53	0.40
1:A:1242:LEU:HD13	1:A:1285:GLY:HA2	2.04	0.40
1:A:1791:HIS:O	1:A:1794:GLU:HG3	2.22	0.40
1:A:1564:PRO:HA	1:A:1567:GLU:HG3	2.03	0.40
1:A:333:THR:HG22	1:A:334:LYS:N	2.36	0.40
1:A:679:ALA:O	1:A:683:VAL:HG23	2.22	0.40
1:A:1554:ASN:O	1:A:1554:ASN:ND2	2.53	0.40
1:A:356:ILE:HG22	1:A:370:PHE:HB3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1739/2804 (62%)	1723 (99%)	16 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1328/2215 (60%)	1322 (100%)	6 (0%)	86	95

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	772	THR
1	A	891[A]	ARG
1	A	891[B]	ARG
1	A	1035	ARG
1	A	1136[A]	ARG
1	A	1136[B]	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	510	GLN
1	A	733	GLN

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Mol	Chain	Res	Type
1	A	784	HIS
1	A	788	HIS
1	A	800	GLN
1	A	831	GLN
1	A	880	HIS
1	A	954	GLN
1	A	1187	GLN
1	A	1239	GLN
1	A	1291	GLN
1	A	1347	ASN
1	A	1365	ASN
1	A	1369	GLN
1	A	1385	ASN
1	A	1479	GLN
1	A	1658	GLN
1	A	1677	GLN
1	A	1707	GLN
1	A	1733	GLN
1	A	1757	GLN
1	A	1758	GLN
1	A	1788	GLN
1	A	1854	GLN
1	A	1888	GLN
1	A	1963	HIS
1	A	2035	GLN
1	A	2113	GLN
1	A	2116	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

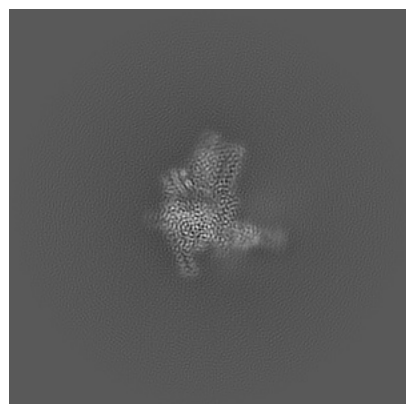
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43152. These allow visual inspection of the internal detail of the map and identification of artifacts.

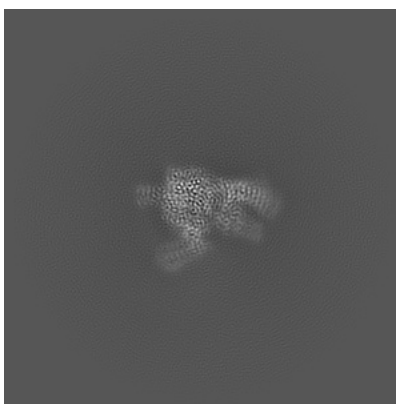
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

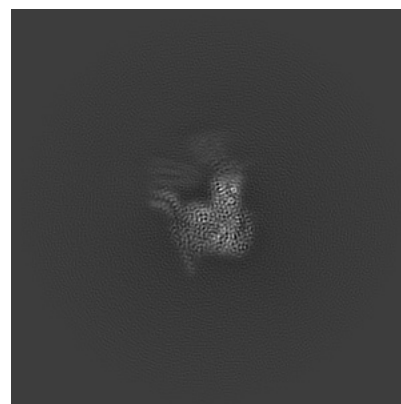
6.1.1 Primary map



X

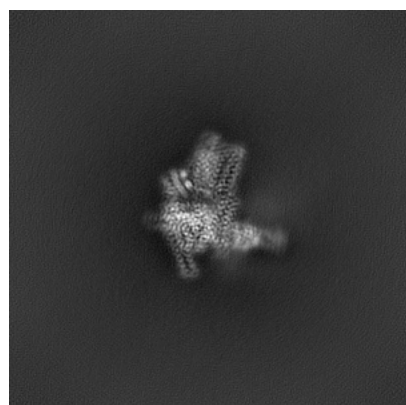


Y

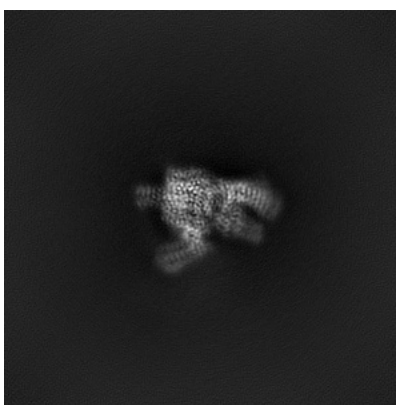


Z

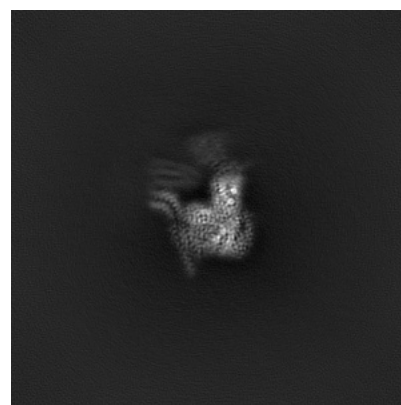
6.1.2 Raw map



X



Y

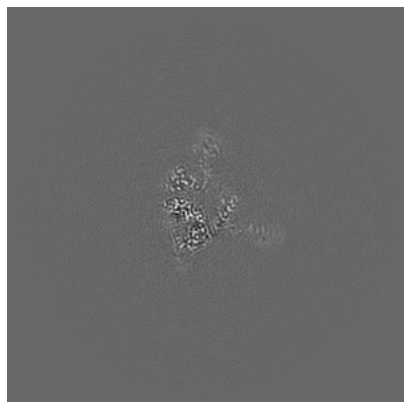


Z

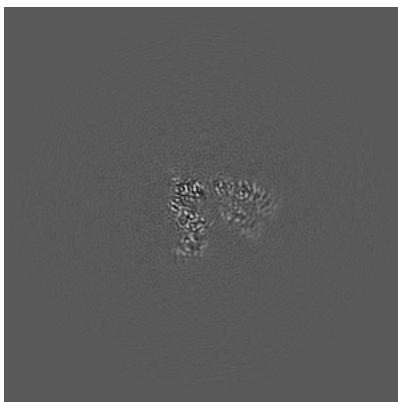
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

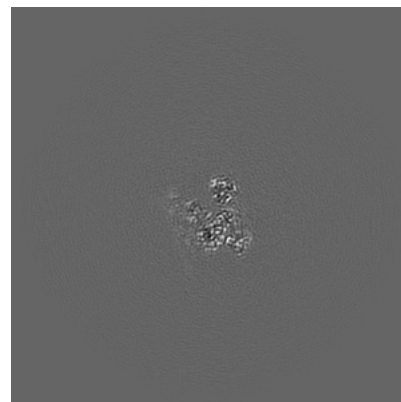
6.2.1 Primary map



X Index: 160

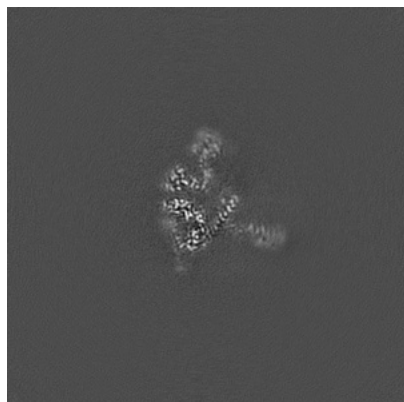


Y Index: 160



Z Index: 160

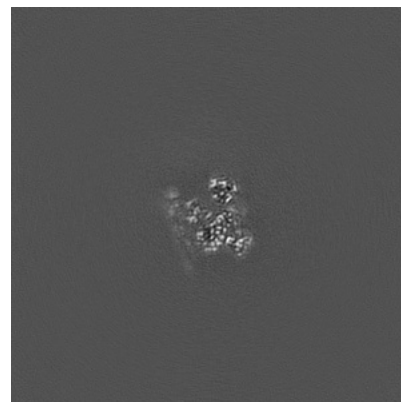
6.2.2 Raw map



X Index: 160



Y Index: 160

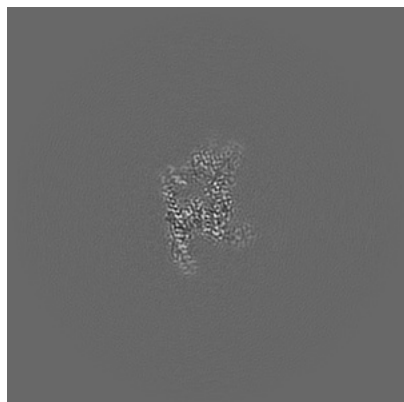


Z Index: 160

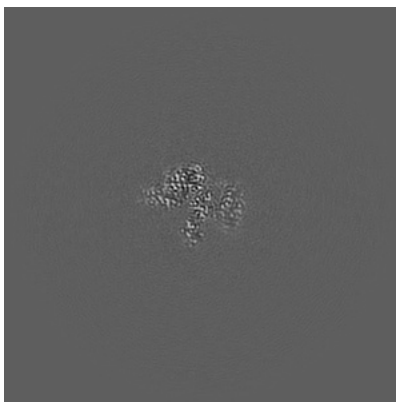
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

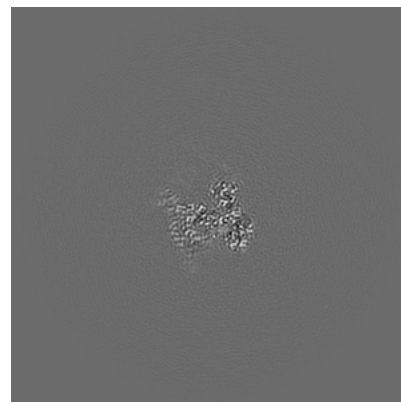
6.3.1 Primary map



X Index: 174

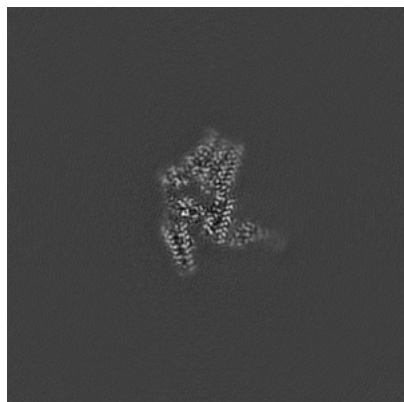


Y Index: 137

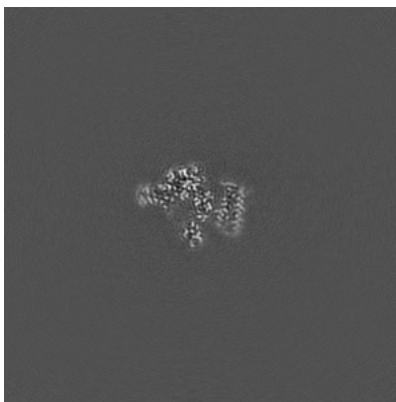


Z Index: 150

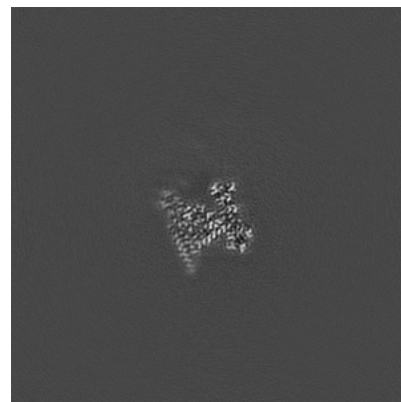
6.3.2 Raw map



X Index: 170



Y Index: 139

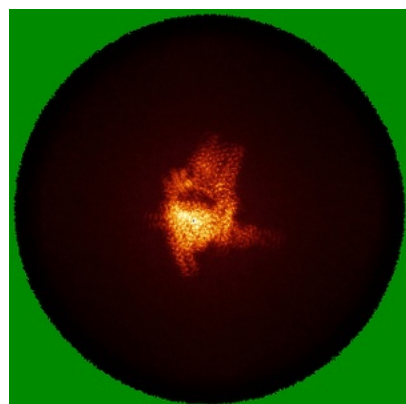


Z Index: 153

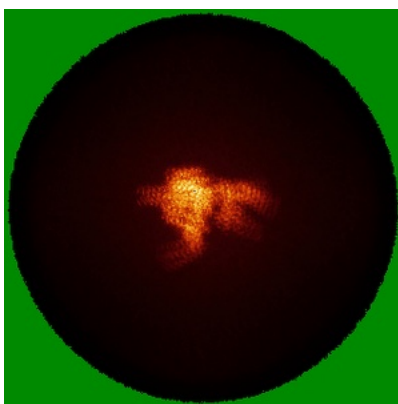
The images above show the largest variance slices of the map in three orthogonal directions.

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

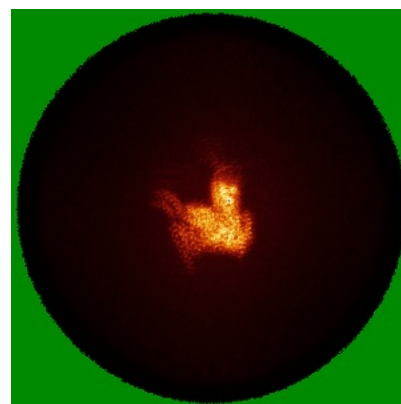
6.4.1 Primary map



X

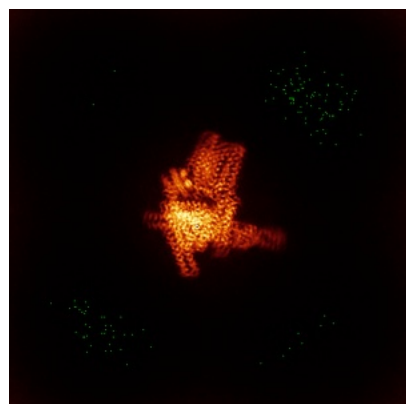


Y

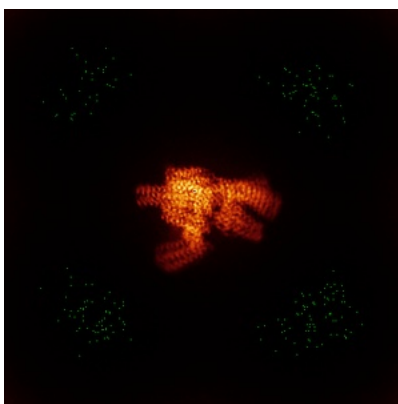


Z

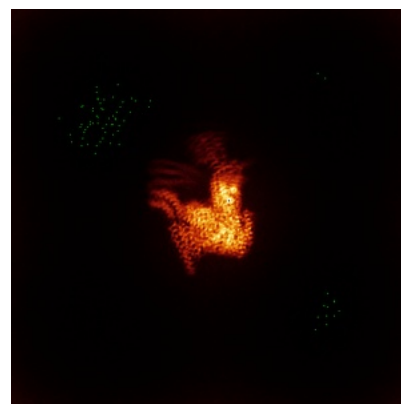
6.4.2 Raw map



X



Y

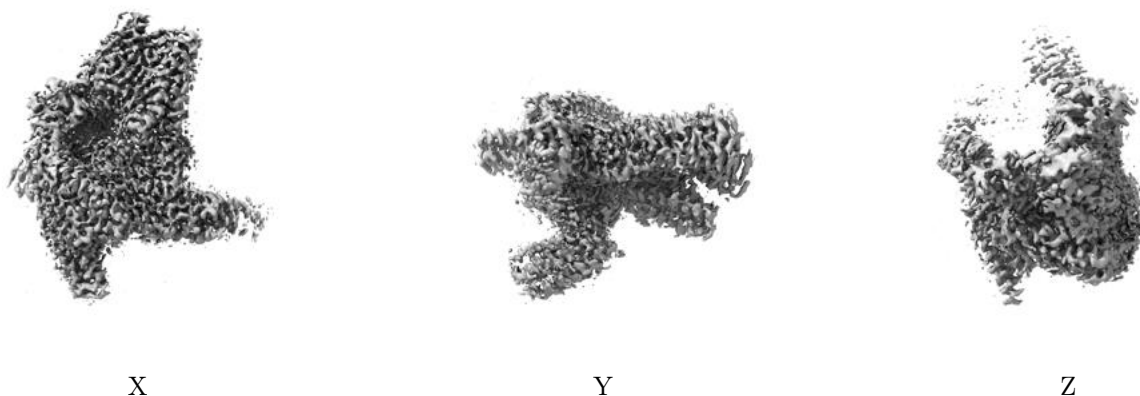


Z

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.

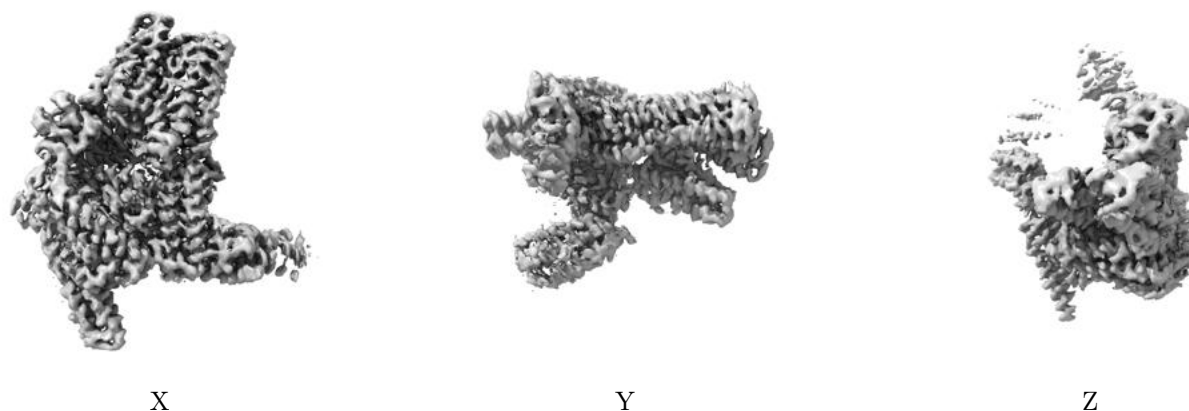
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.218. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

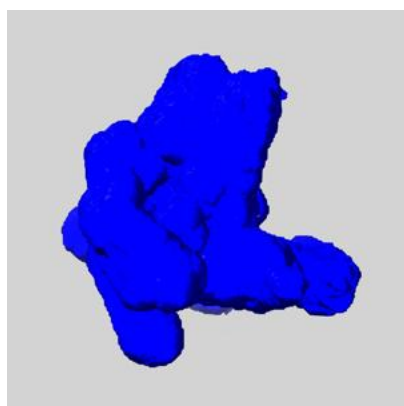
6.6 Mask visualisation [i](#)

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

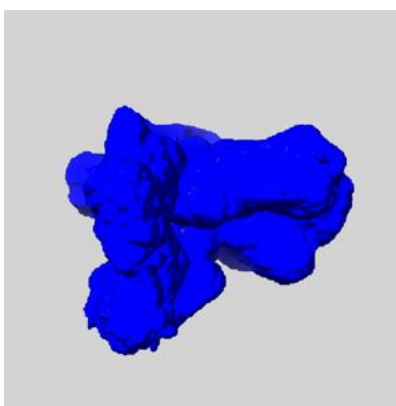
A mask typically either:

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

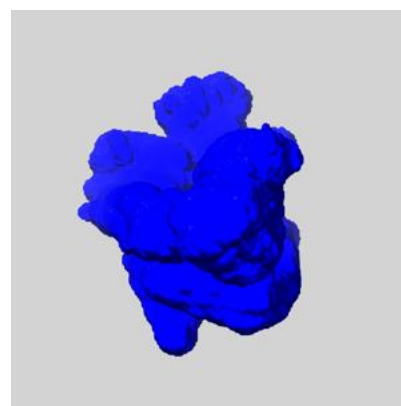
6.6.1 emd_43152_msk_1.map [i](#)



X



Y

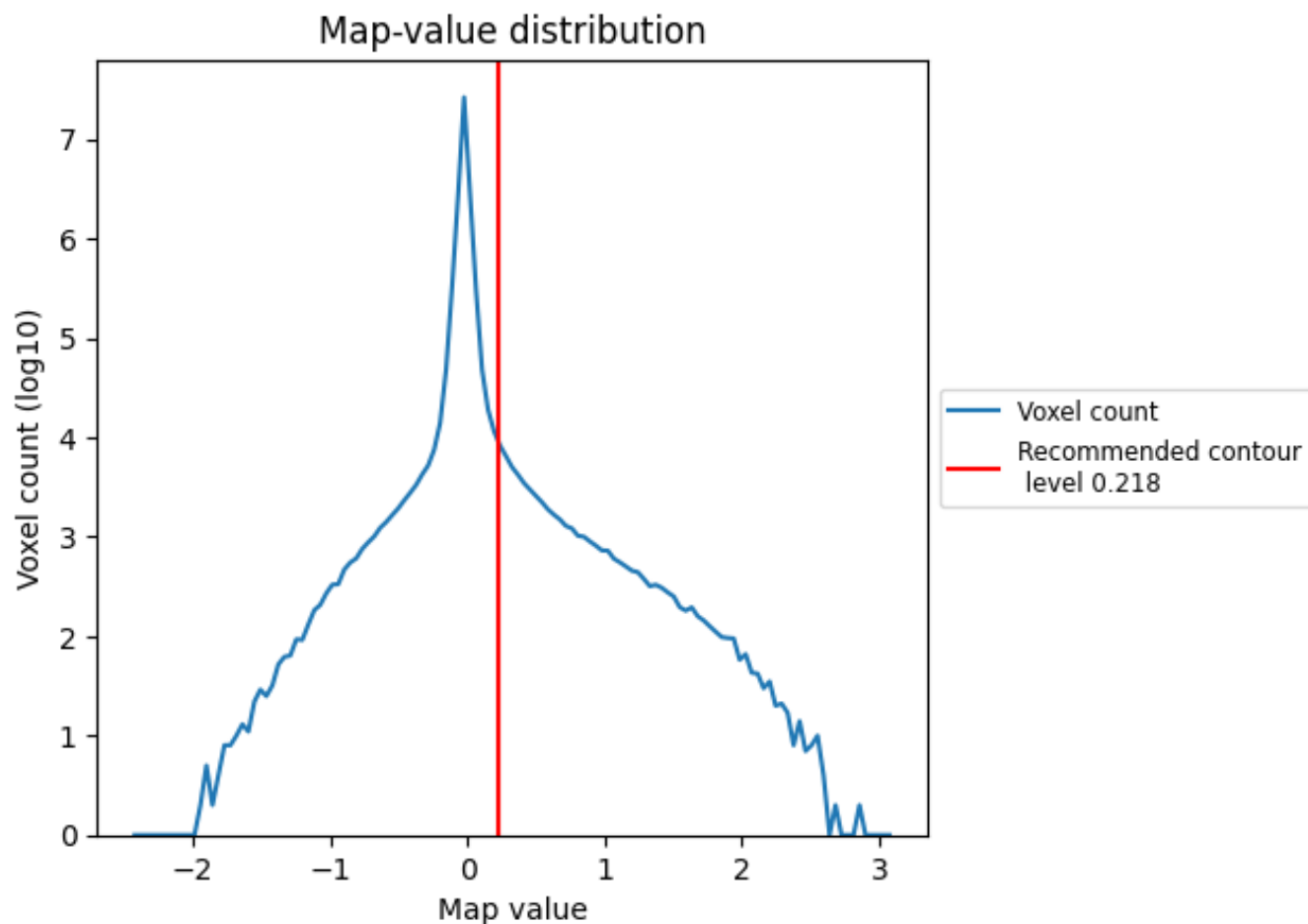


Z

7 Map analysis [i](#)

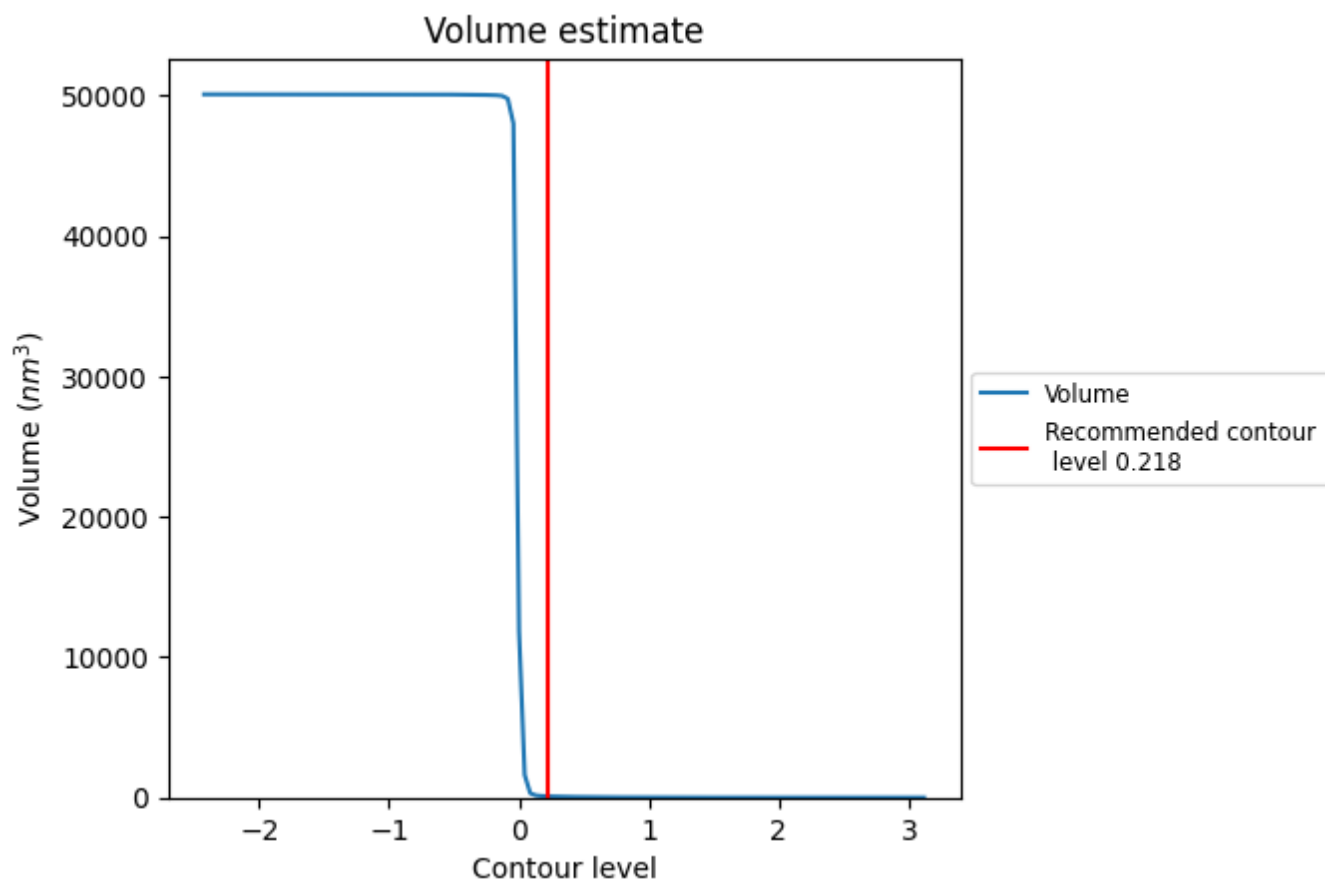
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

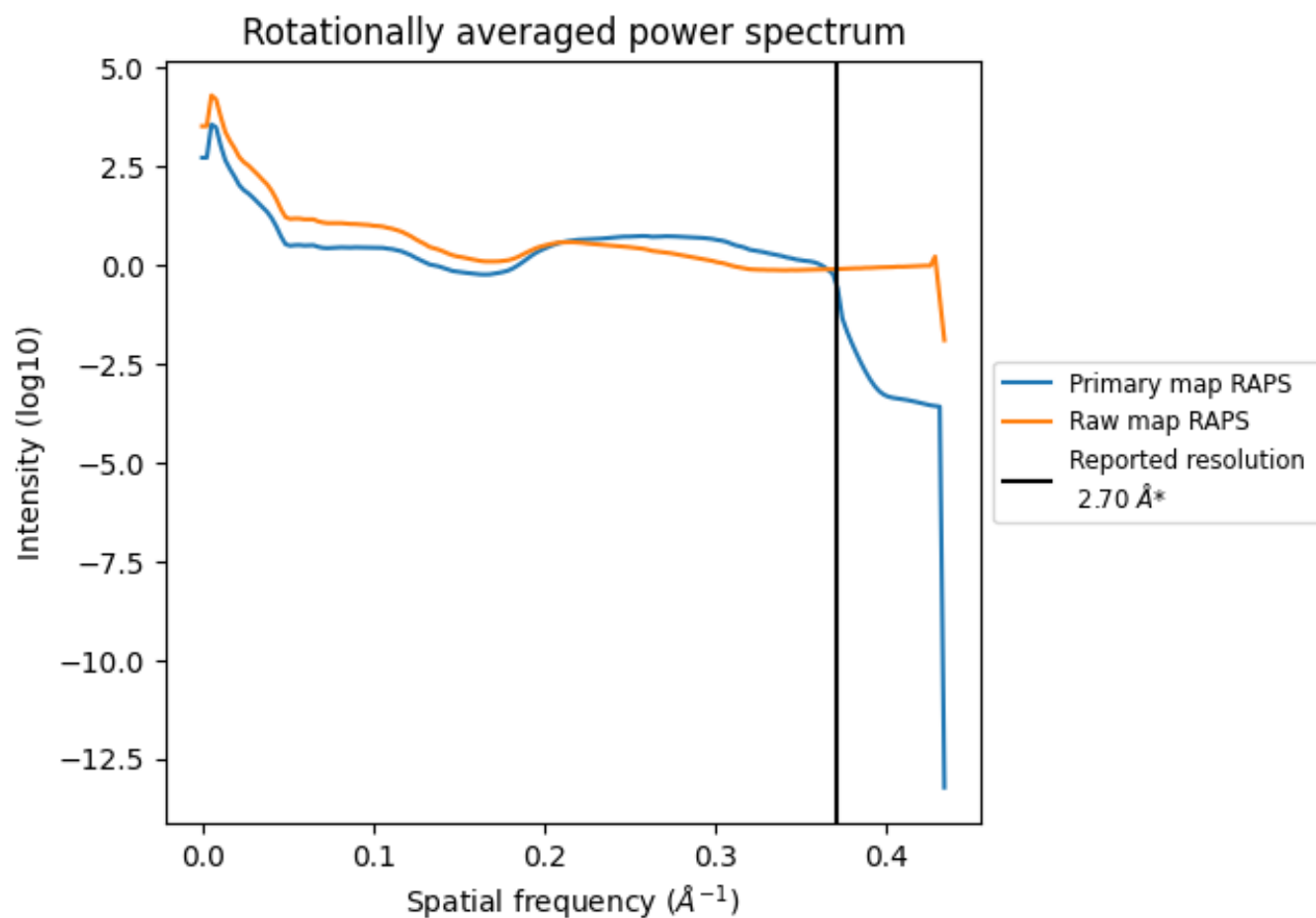
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 90 nm³; this corresponds to an approximate mass of 82 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

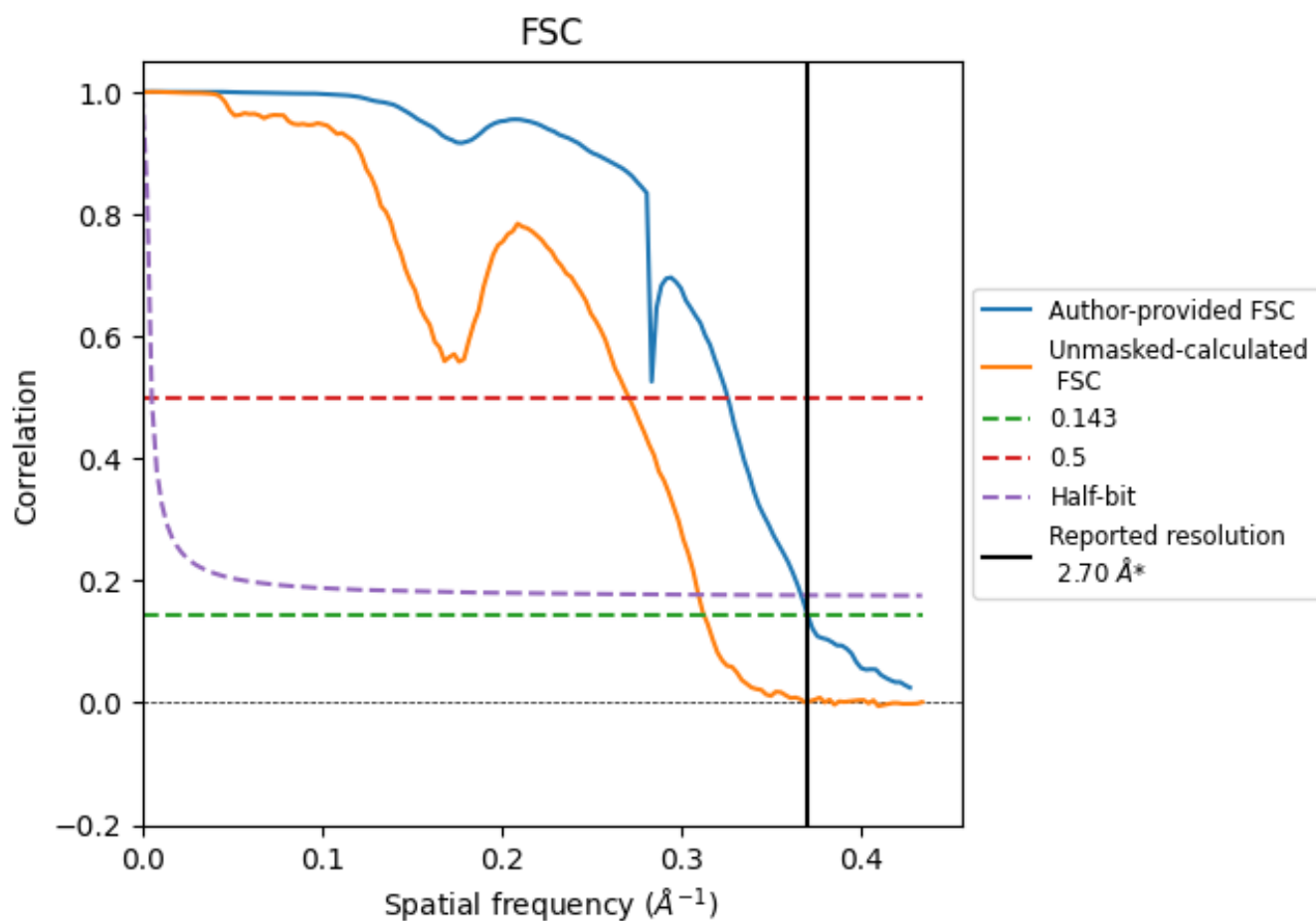


*Reported resolution corresponds to spatial frequency of 0.370 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.370 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

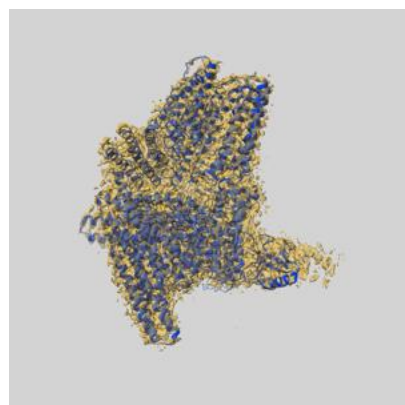
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	2.70	3.07	2.73
Unmasked-calculated*	3.20	3.70	3.23

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.20 differs from the reported value 2.7 by more than 10 %

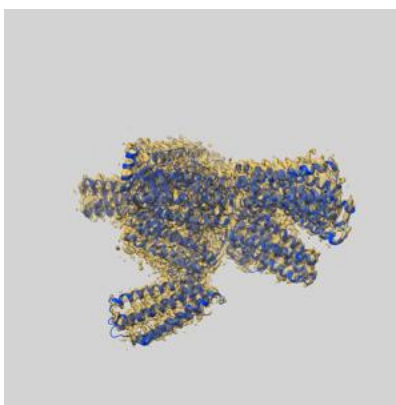
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-43152 and PDB model 8VDO. Per-residue inclusion information can be found in [section 3](#) on [page 4](#).

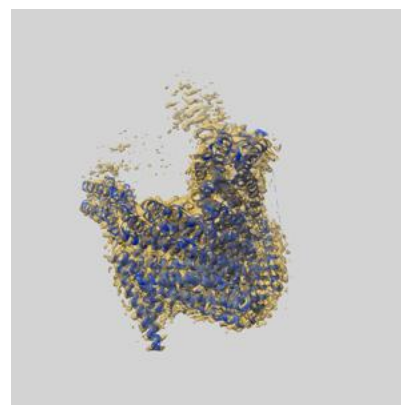
9.1 Map-model overlay [i](#)



X



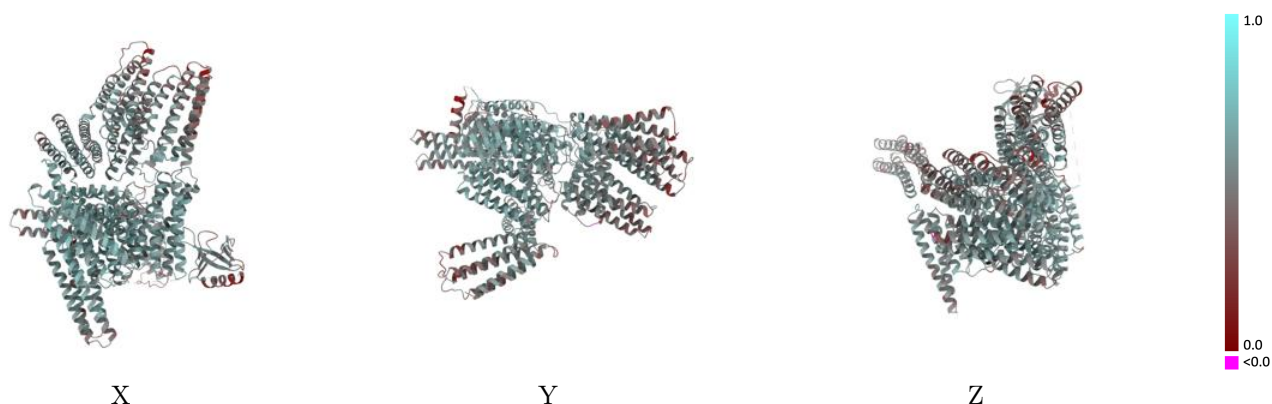
Y



Z

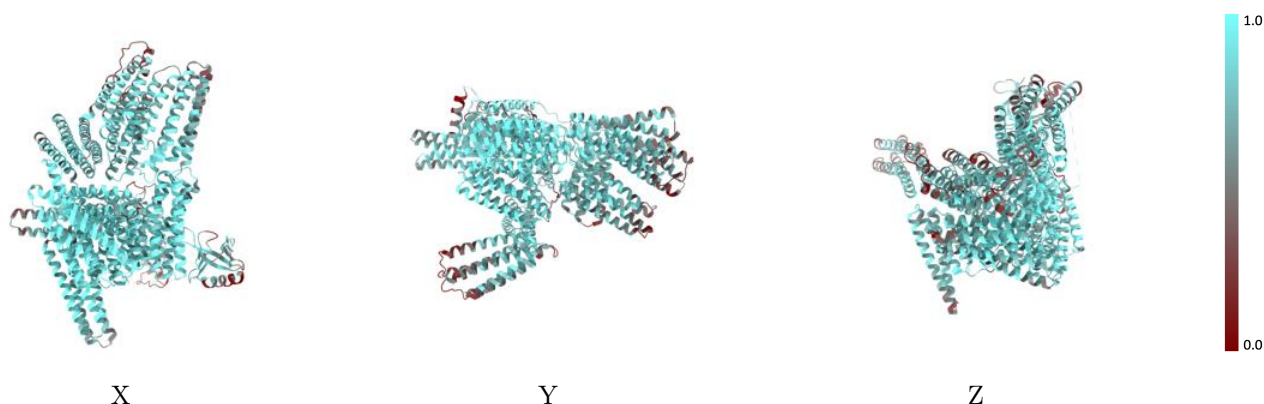
The images above show the 3D surface view of the map at the recommended contour level 0.218 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



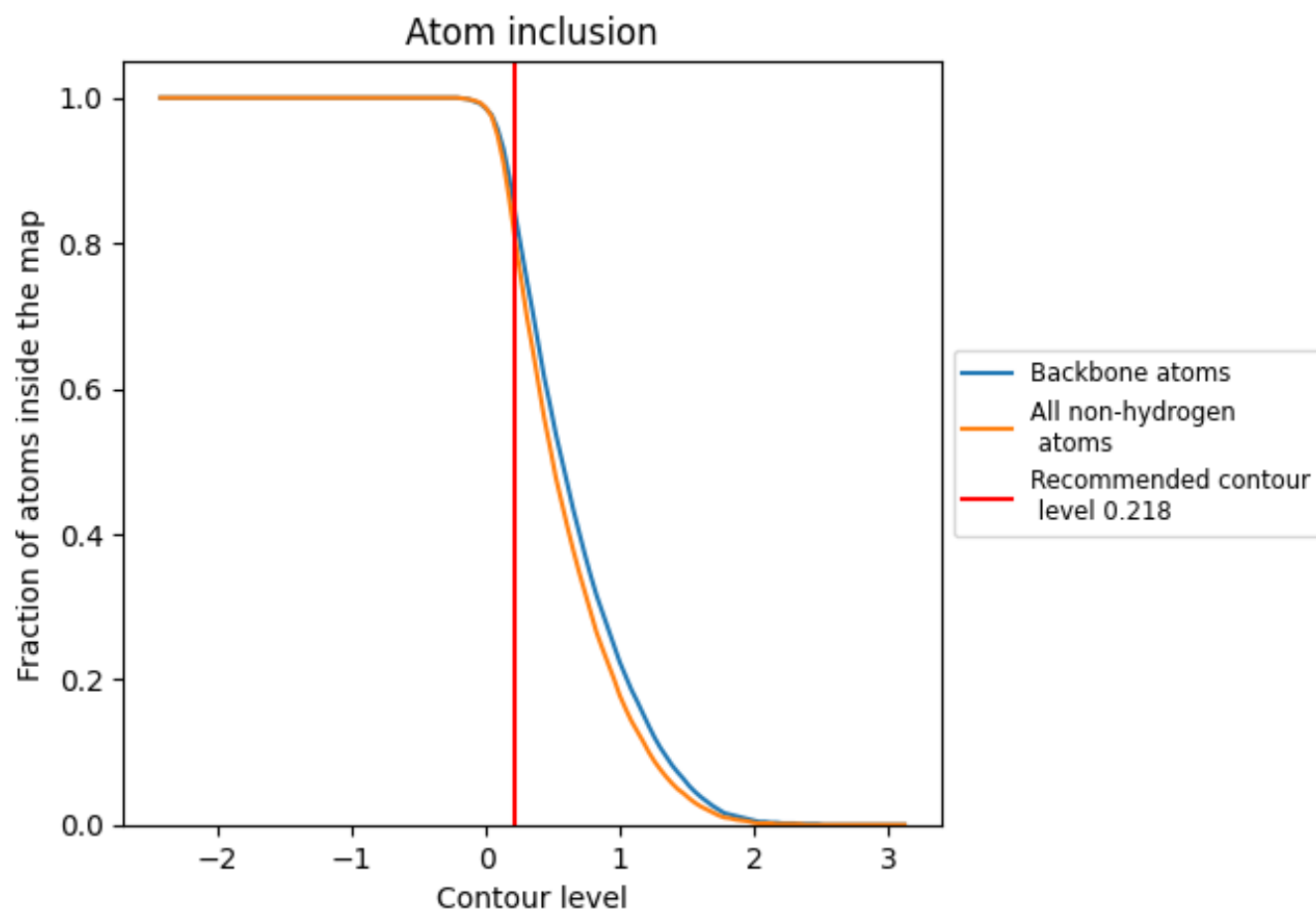
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.218).

9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 80% 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 (0.218) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8040	0.5330
A	0.8040	0.5330

