Full wwPDB EM Validation Report ⓘ

Jan 1, 2025 – 01:45 PM EST

PDB ID	:	8VDO
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:

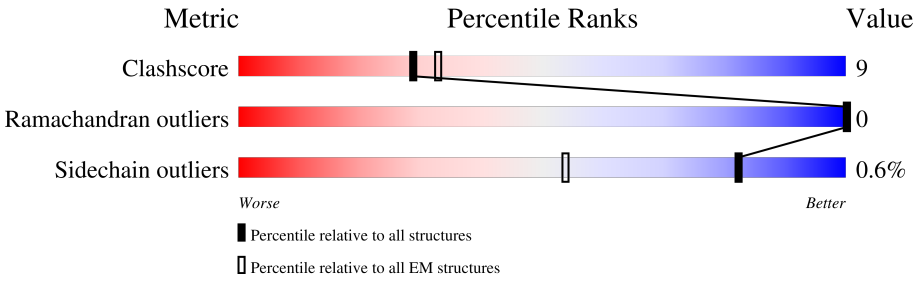
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.70 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 <=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 (i)

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
			Total	C	N	O	S		
1	A	1740	12691	7794	2267	2568	62	3	0

There are 28 discrepancies between the modelled and reference sequences:

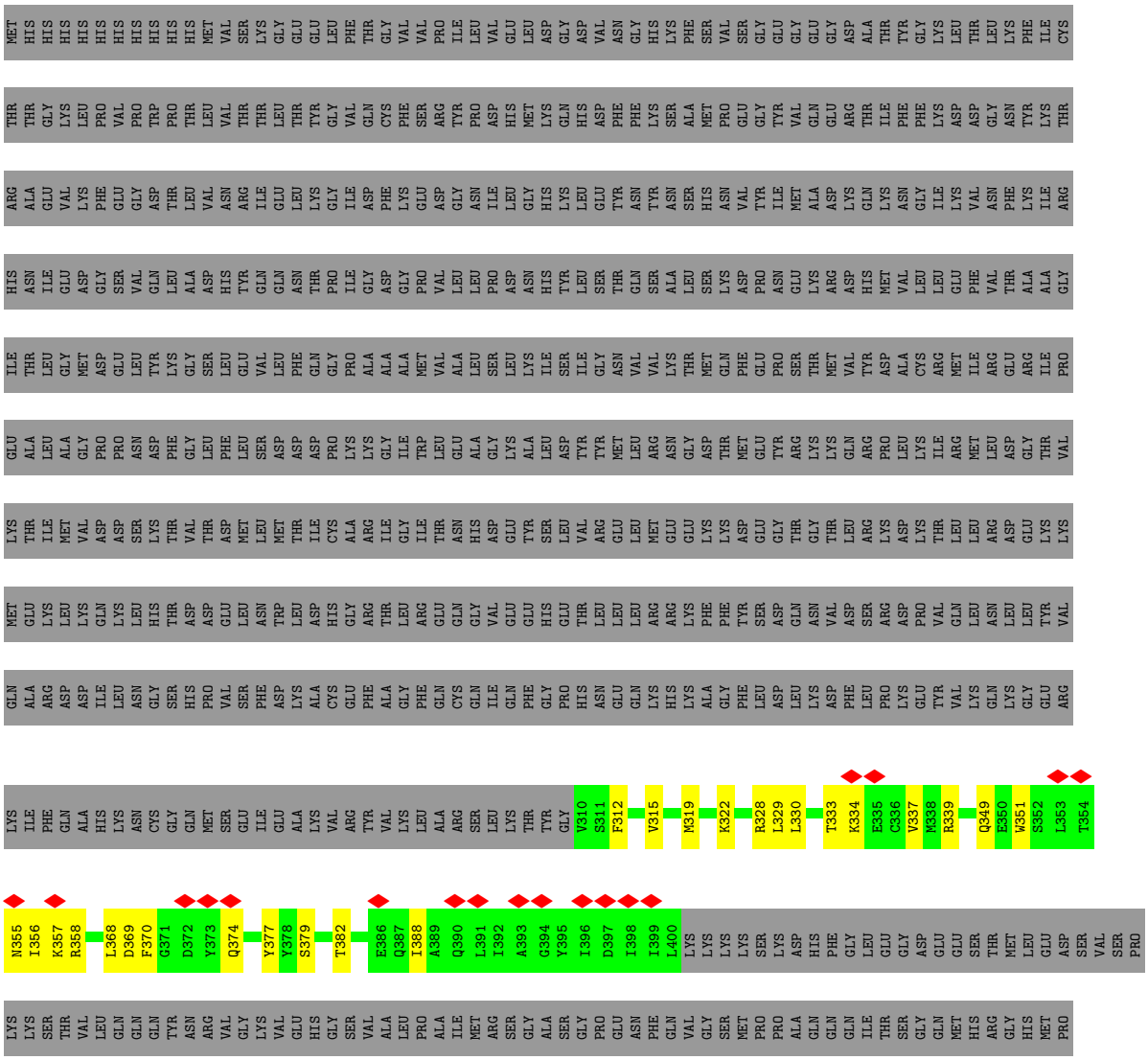
Chain	Residue	Modelled	Actual	Comment	Reference
A	-262	MET	-	expression tag	UNP A0A9X4KGN5
A	-261	HIS	-	expression tag	UNP A0A9X4KGN5
A	-260	HIS	-	expression tag	UNP A0A9X4KGN5
A	-259	HIS	-	expression tag	UNP A0A9X4KGN5
A	-258	HIS	-	expression tag	UNP A0A9X4KGN5
A	-257	HIS	-	expression tag	UNP A0A9X4KGN5
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

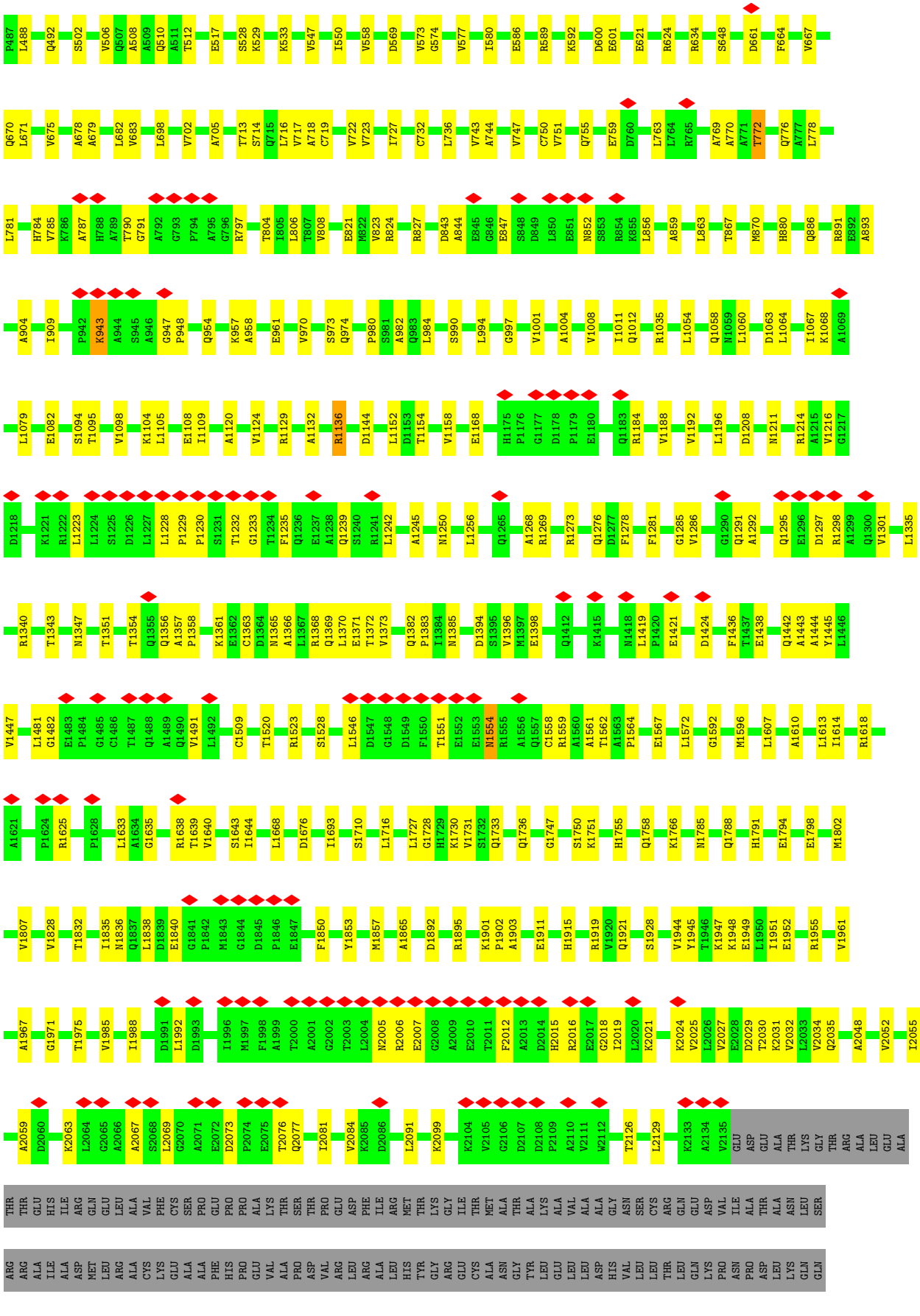
3 Residue-property plots (i)

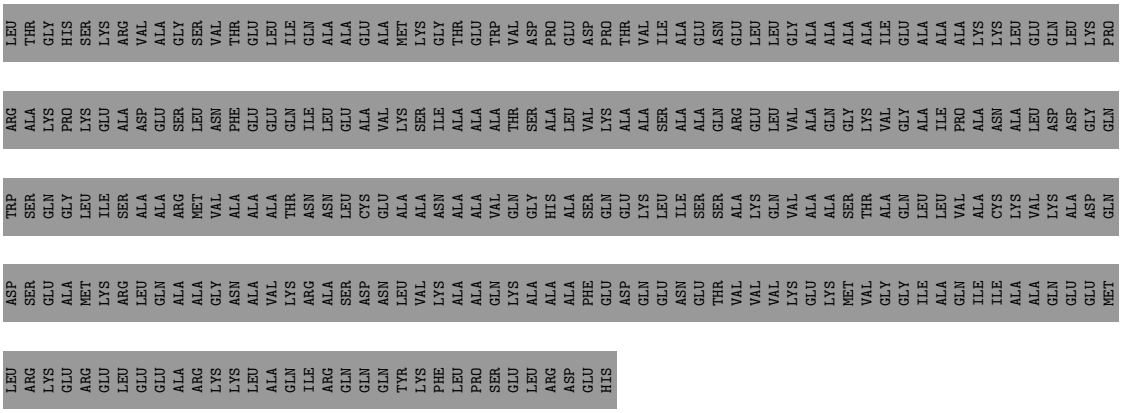
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Green fluorescent protein,Talin-1

Chain A:




P487 L488 Q492 S502 V506 Q507 A508 A509 Q510 A511 T512 E517 S528 K529 K533 V547 I550 V558 D569 V573 G574 V577 I580 E586 R589 K592 D600 E601 E621 R624 R634 S648 D661 F664 V667
Q670 L671 V675 A678 A679 L682 V683 L698 V702 A705 T713 S714 Q715 L716 V717 A718 C719 V722 V723 I727 C732 L736 V743 A744 V747 C750 V751 Q755 E759 D760 L763 L764 R765 A769 A770 A771 T772 Q776 A777 L778
L781 H784 V785 K786 A787 H788 A789 T790 G791 A792 G793 P794 A795 G796 R797 T804 I805 L806 T807 V808 E821 M822 V823 R824 R827 D843 A844 E845 G846 E847 S848 D849 L850 E851 N852 S853 R854 K855 L856 A859 L863 T867 M870 H880 Q886 R891 E892 A893
A904 I909 P942 K943 A944 S945 A946 G947 P948 Q954 K957 A958 E961 V970 S973 Q974 P980 S981 A982 Q983 L984 S990 L994 G997 V1001 A1004 V1008 I1011 Q1012 R1035 L1054 Q1058 N1059 L1060 D1063 L1064 I1067 K1068 A1069
L1079 E1082 S1094 T1095 V1098 K1104 L1105 E1108 I1109 A1120 V1124 R1129 A1132 R1136 D1144 L1152 D1153 T1154 V1158 E1168 H1175 P1176 G1177 D1178 P1179 E1180 Q1183 R1184 V1188 V1192 L1196 D1208 N1211 R1214 A1215 V1216 G1217
D1218 K1221 R1222 L1223 L1224 S1225 D1226 L1227 L1228 P1229 P1230 S1231 T1232 G1233 T1234 F1235 Q1236 E1237 A1238 Q1239 S1240 R1241 L1242 A1245 N1250 L1256 Q1265 A1268 R1269 R1273 Q1276 D1277 F1278 F1281 G1285 V1286 G1290 Q1291 A1292 Q1295 E1296 D1297 R1298 A1299 Q1300 V1301 L1335
R1340 T1343 N1347 T1351 T1354 Q1355 Q1356 A1357 P1358 K1361 E1362 C1363 D1364 N1365 A1366 L1367 R1368 Q1369 L1370 E1371 T1372 V1373 Q1382 P1383 I1384 N1385 D1394 S1395 V1396 M1397 E1398 Q1412 K1415 N1418 L1419 P1420 E1421 D1424 F1436 T1437 E1438 Q1442 A1443 A1444 Y1445 L1446
V1447 L1481 G1482 E1483 P1484 G1485 C1486 T1487 Q1488 A1489 Q1490 V1491 L1492 C1509 T1520 R1523 S1528 L1546 D1547 G1548 D1549 F1550 T1551 E1552 E1553 N1554 R1555 A1556 Q1557 C1558 R1559 A1560 A1561 T1562 A1563 P1564 E1567 L1572 G1592 M1596 L1607 A1610 L1613 I1614 R1618
A1621 P1624 R1625 P1628 L1633 A1634 G1635 R1638 T1639 V1640 S1643 I1644 L1668 D1676 I1693 S1710 L1716 L1727 G1728 H1729 K1730 V1731 S1732 Q1733 Q1736 G1747 S1750 K1751 H1755 Q1758 K1766 N1785 Q1788 H1791 E1794 E1798 M1802
V1807 V1828 T1832 I1835 N1836 Q1837 L1838 D1839 E1840 G1841 P1842 M1843 G1844 D1845 P1846 E1847 F1850 Y1853 M1857 A1865 D1892 R1895 K1901 P1902 A1903 E1911 H1915 R1919 V1920 Q1921 S1928 V1944 Y1945 T1946 K1947 K1948 E1949 L1950 I1951 E1952 R1955 V1961
A1967 G1971 T1975 V1985 I1988 D1991 L1992 D1993 I1996 M1997 F1998 A1999 T2000 A2001 G2002 T2003 L2004 N2005 R2006 E2007 G2008 A2009 E2010 T2011 F2012 A2013 D2014 H2015 R2016 E2017 G2018 I2019 L2020 K2021 K2024 V2025 L2026 V2027 E2028 D2029 T2030 K2031 V2032 L2033 V2034 Q2035 A2048 V2052 I2055
A2059 D2060 K2063 L2064 G2065 A2066 A2067 S2068 L2069 G2070 A2071 E2072 D2073 P2074 E2075 T2076 Q2077 I2081 V2084 K2085 D2086 L2091 K2099 K2104 V2105 G2106 D2107 D2108 P2109 A2110 V2111 W2112 T2126 L2129 K2133 A2134 V2135 GLU ASP GLU ALA THR LYS GLY THR ARG ALA LEU GLU ALA
THR THR GLU HIS ILE ARG GLN GLU LEU ALA VAL PHE CYS SER PRO GLU PRO PRO ALA LYS THR SER THR PRO GLU ASP PHE ILE ARG MET THR LYS GLY ILE THR MET ALA THR ALA LYS ALA VAL ALA ALA GLY ASN SER CYS ARG GLN GLU ASP VAL ILE ALA THR ALA ASN PRO ASP LEU GLN SER
ARG ARG ALA ILE ALA ASP MET LEU ARG ALA CYS LYS GLU ALA ALA PHE HIS PRO GLU VAL ALA PRO ASP VAL ARG LEU ARG ALA LEU HIS TYR GLY ARG GLU CYS ALA ASN GLY TYR LEU GLU LEU LEU ASP HIS VAL LEU LEU THR LEU GLN LYS PRO ASN PRO ASP LEU LYS GLN GLN


LEU THR GLY HIS SER LYS ARG VAL ALA GLY SER VAL THR GLU LEU ILE GLN ALA ALA GLU ALA MET LYS GLY THR GLU TRP VAL ASP PRO GLU ASP PRO THR VAL ILE ALA GLU ASN GLU LEU LEU GLY ALA ALA ALA ALA ILE GLU ALA ALA ALA LYS LYS LEU GLU GLN LEU LYS PRO
ARG ALA LYS PRO LYS GLU ALA ASP GLU SER LEU ASN PHE GLU GLU GLN ILE LEU GLU ALA VAL LYS SER ILE ALA ALA ALA THR SER ALA LEU VAL LYS ALA ALA SER ALA ALA GLN ARG GLU LEU VAL ALA GLN GLY LYS VAL GLY ALA ILE PRO ALA ASN ALA LEU ASP ASP GLY GLN
TRP SER GLN GLY LEU ILE SER ALA ALA ARG MET VAL ALA ALA ALA THR ASN ASN LEU CYS GLU ALA ALA ASN ALA ALA VAL GLN GLY HIS ALA SER GLN GLU LYS LEU ILE SER SER ALA LYS GLN VAL ALA ALA ALA SER THR ALA GLN LEU LEU VAL CYS LYS VAL LYS ALA ASP GLN
ASP SER GLU ALA MET LYS ARG LEU GLN ALA ALA GLY ASN ALA VAL LYS ARG ALA SER ASP ASN LEU VAL LYS ALA ALA GLN LYS ALA ALA ALA PHE GLU ASP GLN GLU ASN GLU THR VAL VAL LYS GLU LYS MET VAL GLY GLY ILE ALA GLN ILE ILE ALA ALA GLN GLU GLU MET
LEU ARG LYS GLU ARG GLU LEU GLU GLU ALA ARG LYS LYS LEU ALA GLN ILE ARG GLN GLN GLN TYR LYS PHE LEU PRO SER GLU LEU ARG ASP GLU HIS

4 Experimental information (i)

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 ($e^-/Å^2$)	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 (Å)	368.63998, 368.63998, 368.63998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.152, 1.152, 1.152	Depositor

5 Model quality

5.1 Standard geometry

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	0.28	0/12823	0.45	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

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	234	0
All	All	12691	0	12828	234	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 9.

All (234) 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: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: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: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:377:TYR:CE2	1:A:379:SER:HB3	2.37	0.56
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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:1640:VAL:O	1:A:1643:SER:OG	2.20	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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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
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: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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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: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:1857:MET:HE2	1:A:1903:ALA:HB3	1.98	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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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:1857:MET:HE2	1:A:1903:ALA:CB	2.50	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: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 (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	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%)	1318 (99%)	10 (1%)	79 91

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	355	ASN
1	A	772	THR
1	A	891[A]	ARG
1	A	891[B]	ARG
1	A	943	LYS
1	A	1035	ARG
1	A	1136[A]	ARG
1	A	1136[B]	ARG
1	A	1554	ASN
1	A	1625	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	776	GLN
1	A	784	HIS
1	A	1058	GLN
1	A	1347	ASN
1	A	1369	GLN
1	A	2035	GLN

5.3.3 RNA

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 oligosaccharides 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.

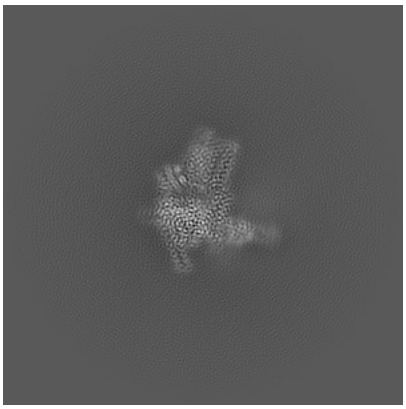
6 Map visualisation

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.

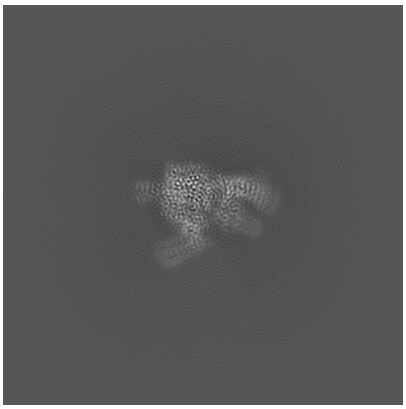
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

6.1.1 Primary map



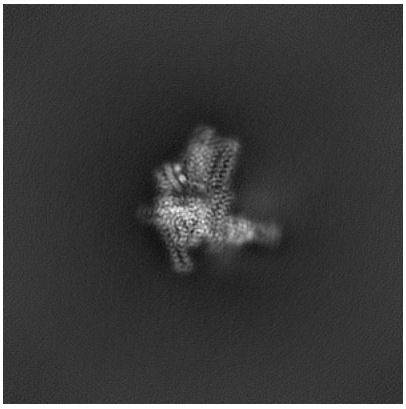
X



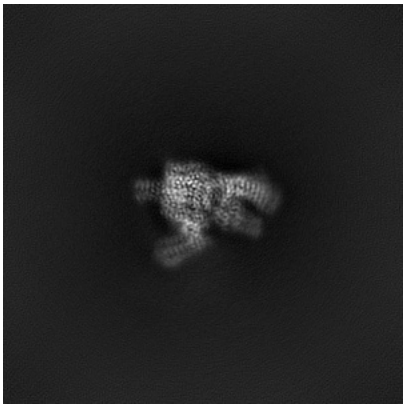
Y

Z

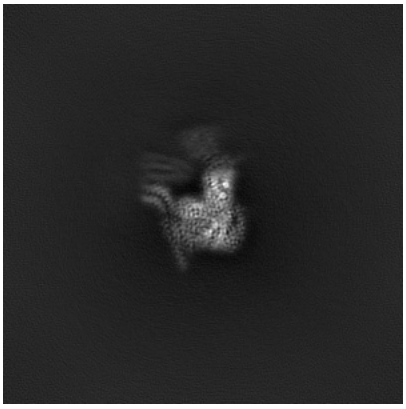
6.1.2 Raw map



X



Y

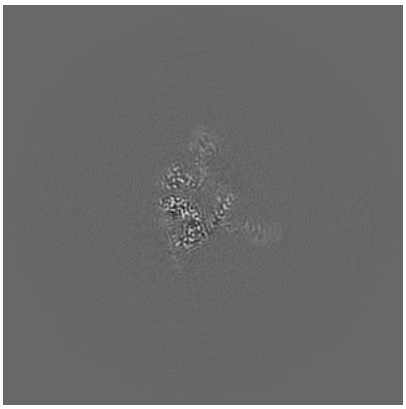


Z

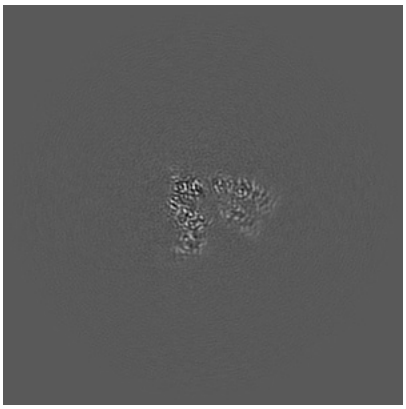
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

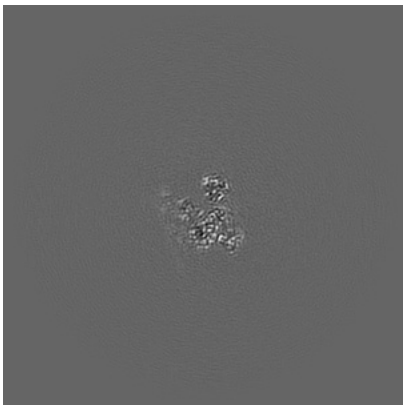
6.2.1 Primary map



X Index: 160

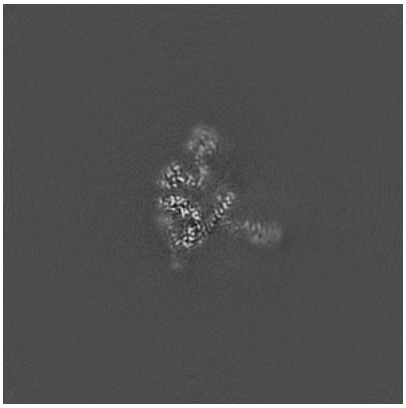


Y Index: 160



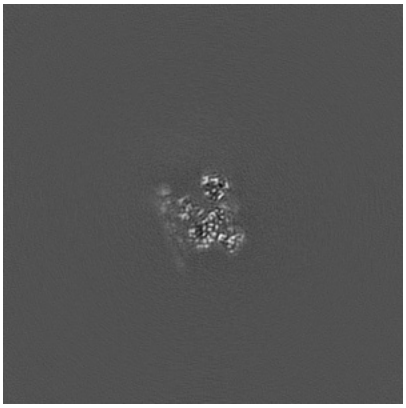
Z Index: 160

6.2.2 Raw map



X Index: 160

Y Index: 160

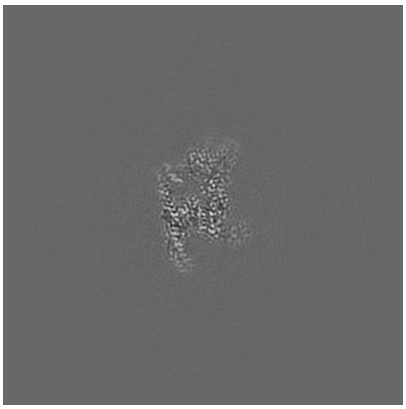


Z Index: 160

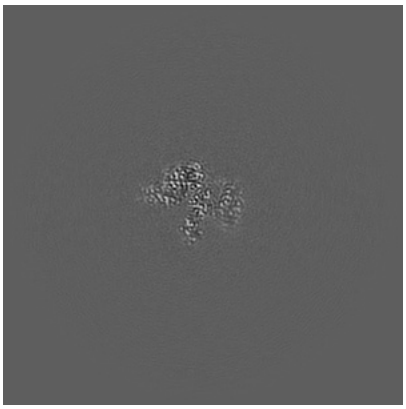
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

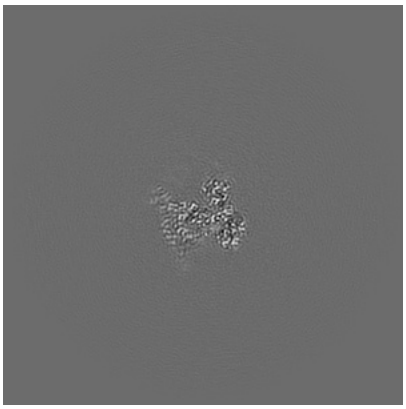
6.3.1 Primary map



X Index: 174

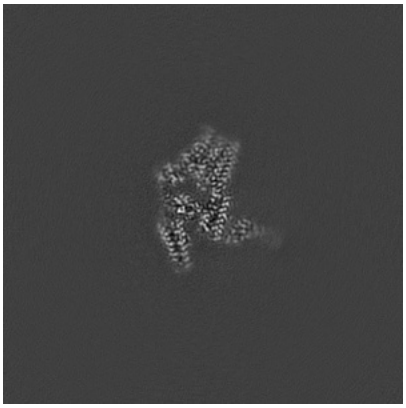


Y Index: 137

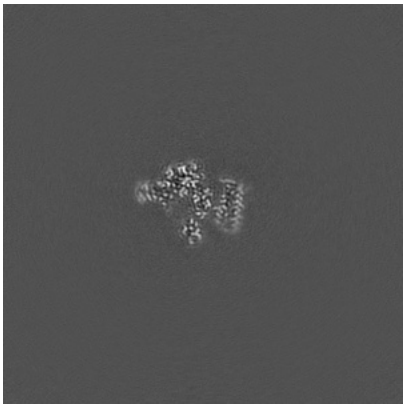


Z Index: 150

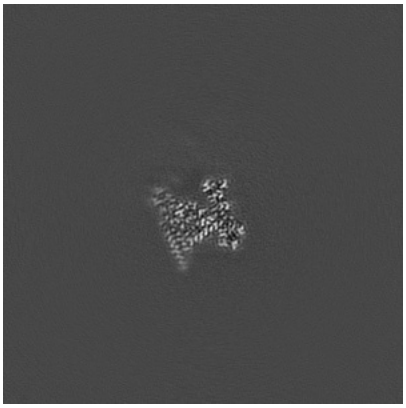
6.3.2 Raw map



X Index: 170



Y Index: 139

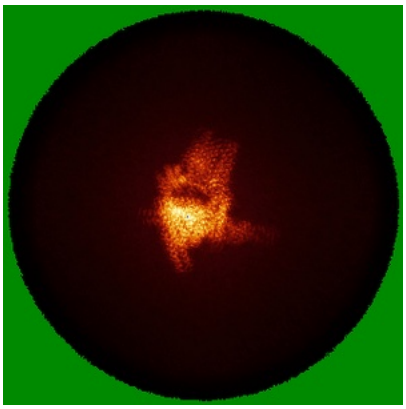


Z Index: 153

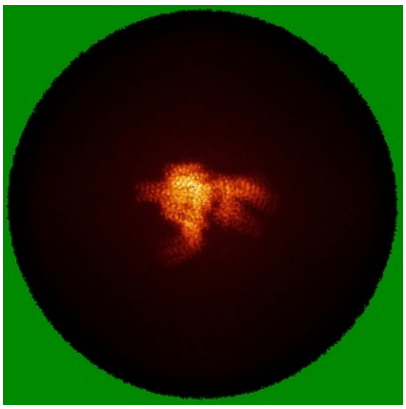
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

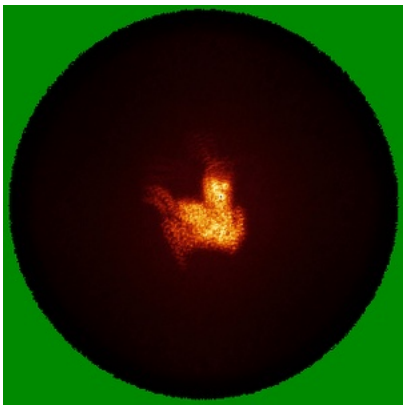
6.4.1 Primary map



X

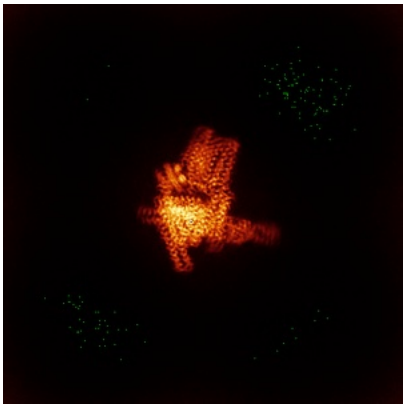


Y

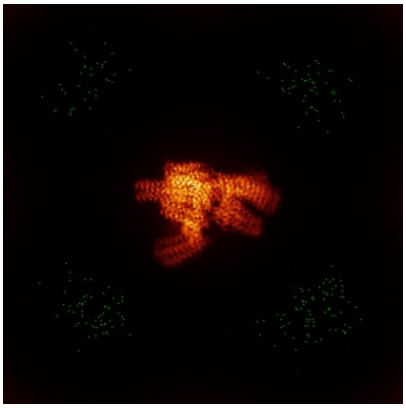


Z

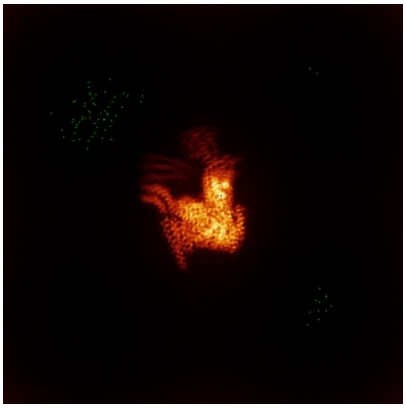
6.4.2 Raw map



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.

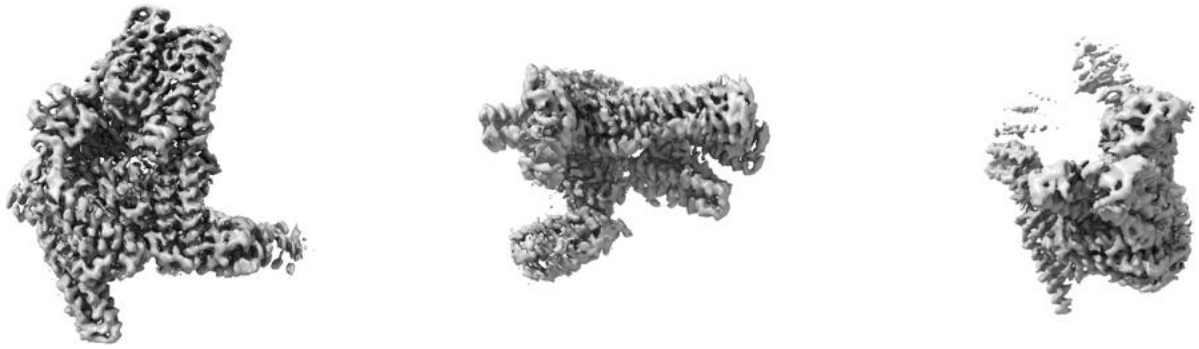
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

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



X Y Z

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.

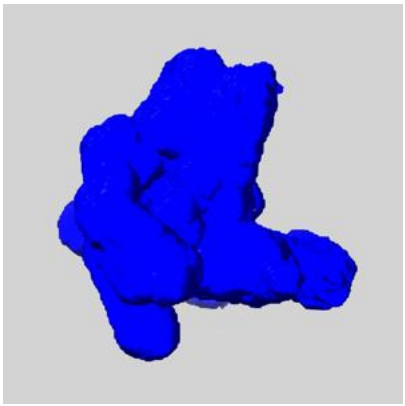
6.6 Mask visualisation (i)

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

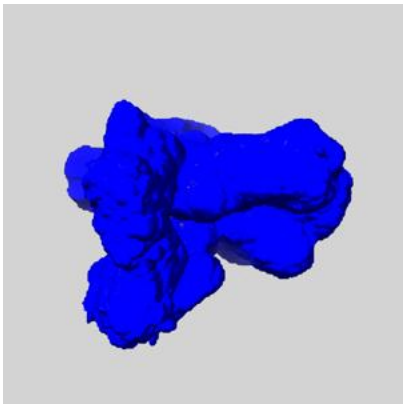
A mask typically either:

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

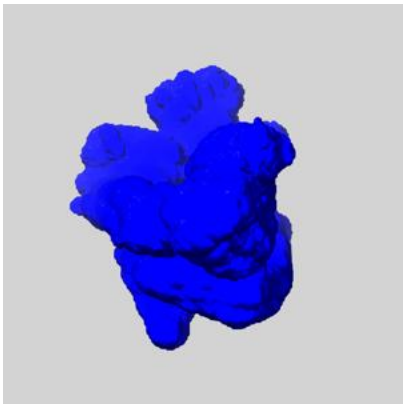
6.6.1 emd_43152_msk_1.map (i)



X



Y

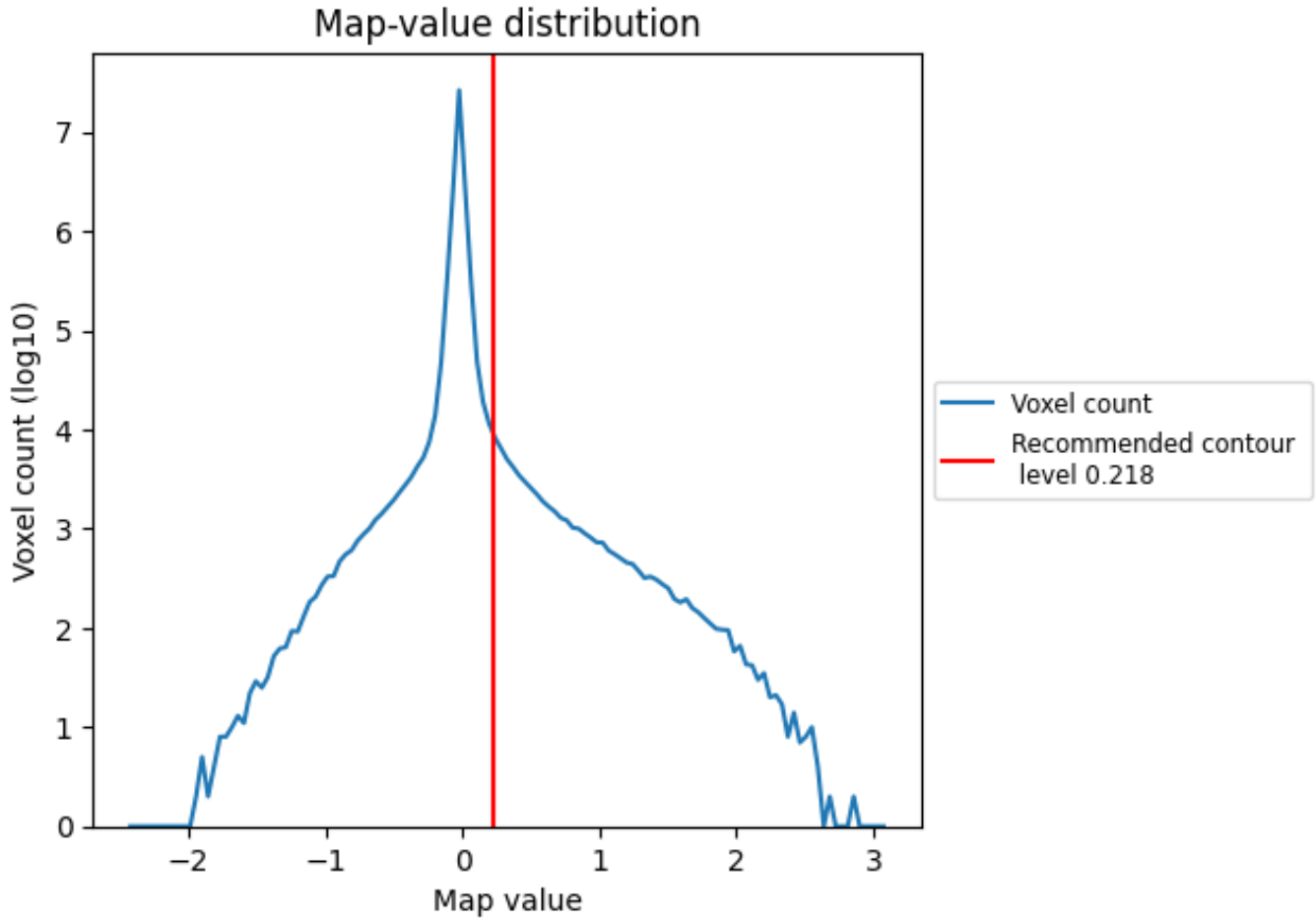


Z

7 Map analysis

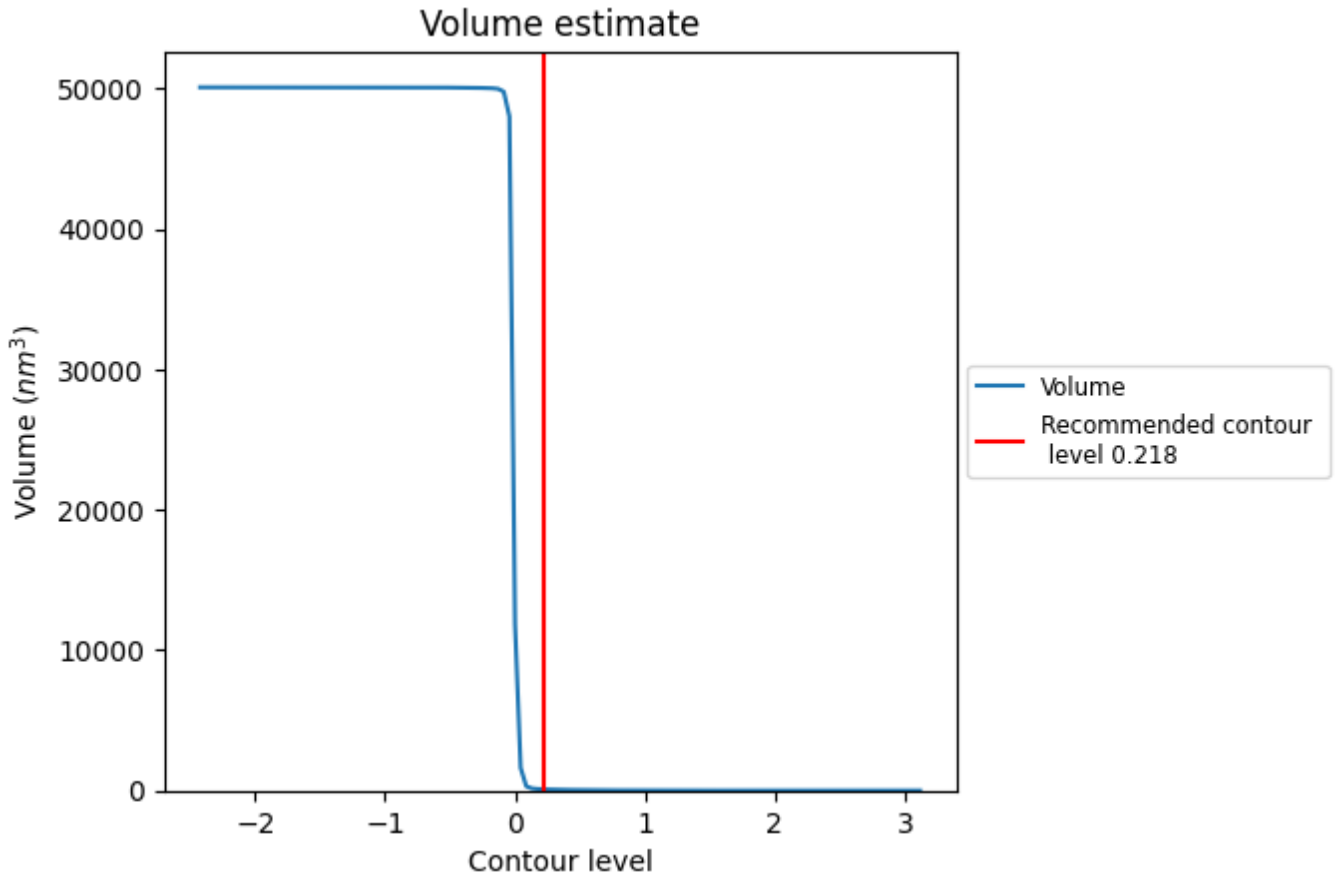
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

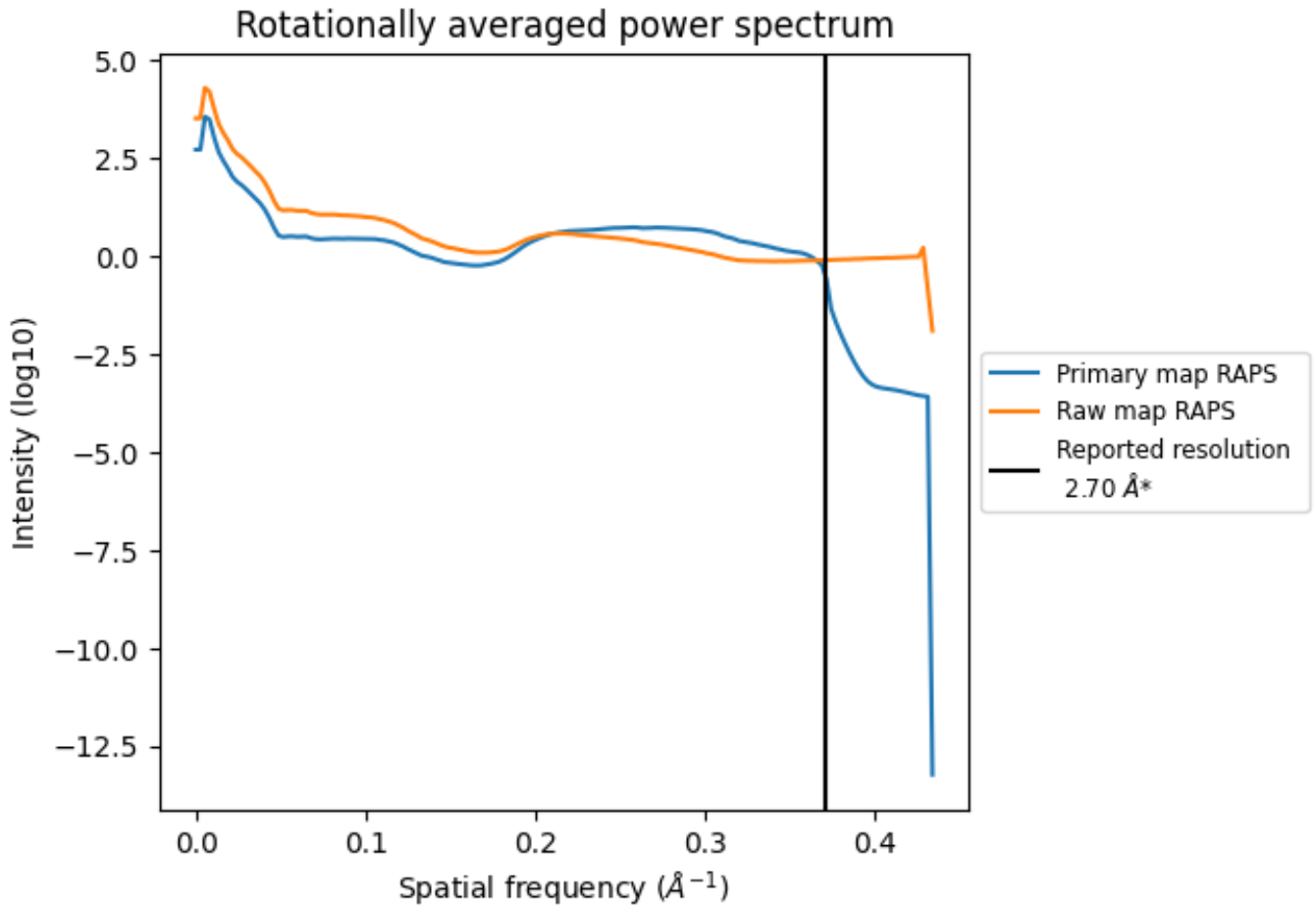
7.2 Volume estimate (i)



The volume at the recommended contour level is 90 nm^3; 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 (i)

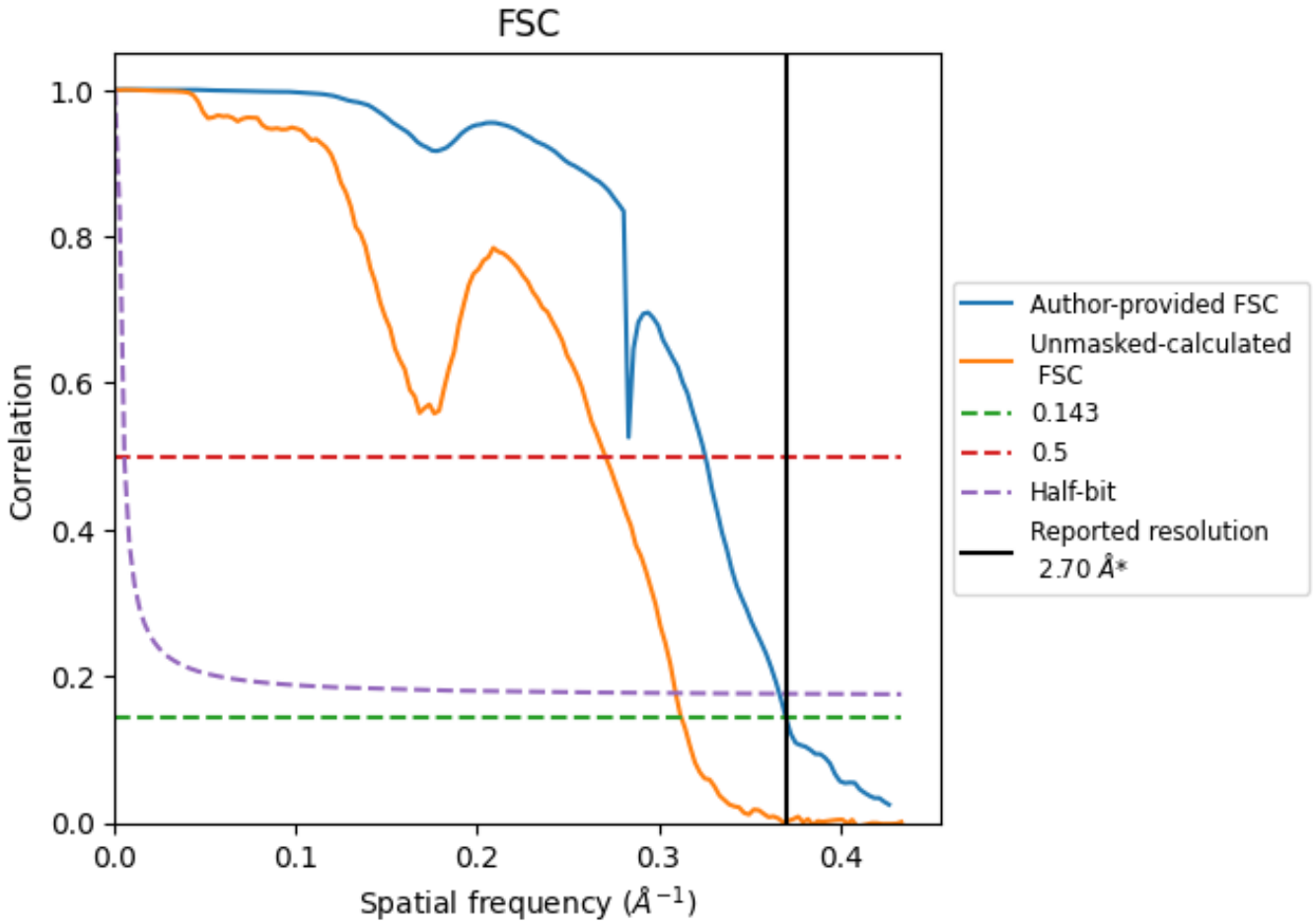


*Reported resolution corresponds to spatial frequency of 0.370 $Å^{-1}$

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8.2 Resolution estimates (i)

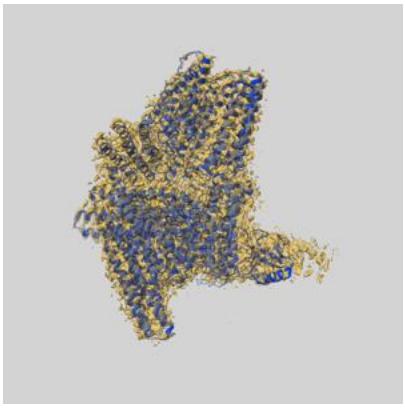
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	2.70	3.07	2.73
Unmasked-calculated*	3.20	3.70	3.23

*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 %

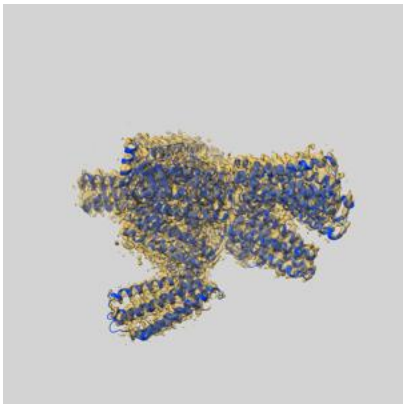
9 Map-model fit

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.

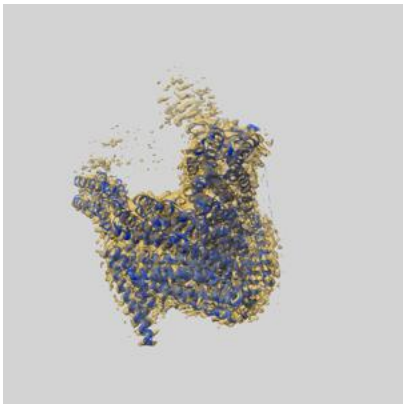
9.1 Map-model overlay



X



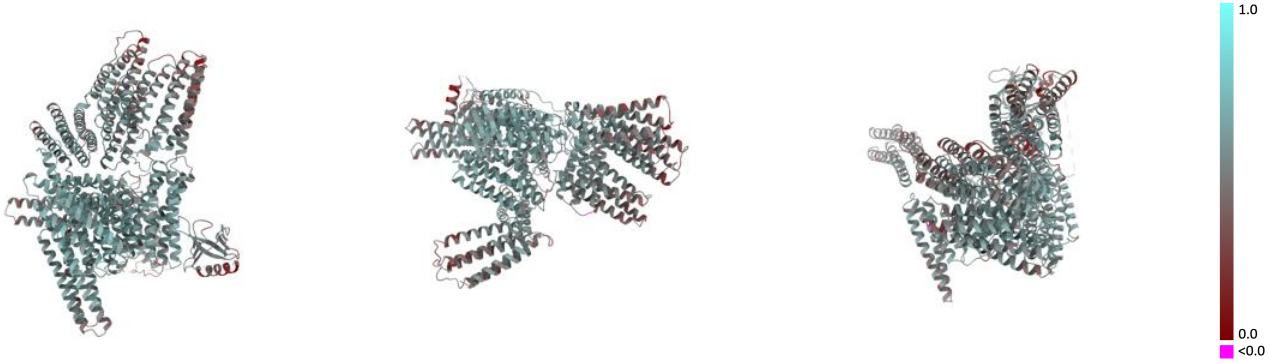
Y



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.

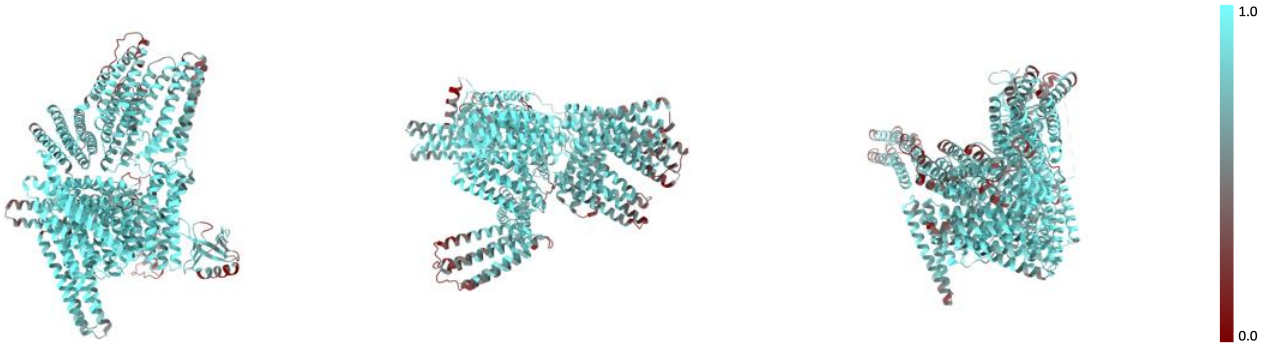
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

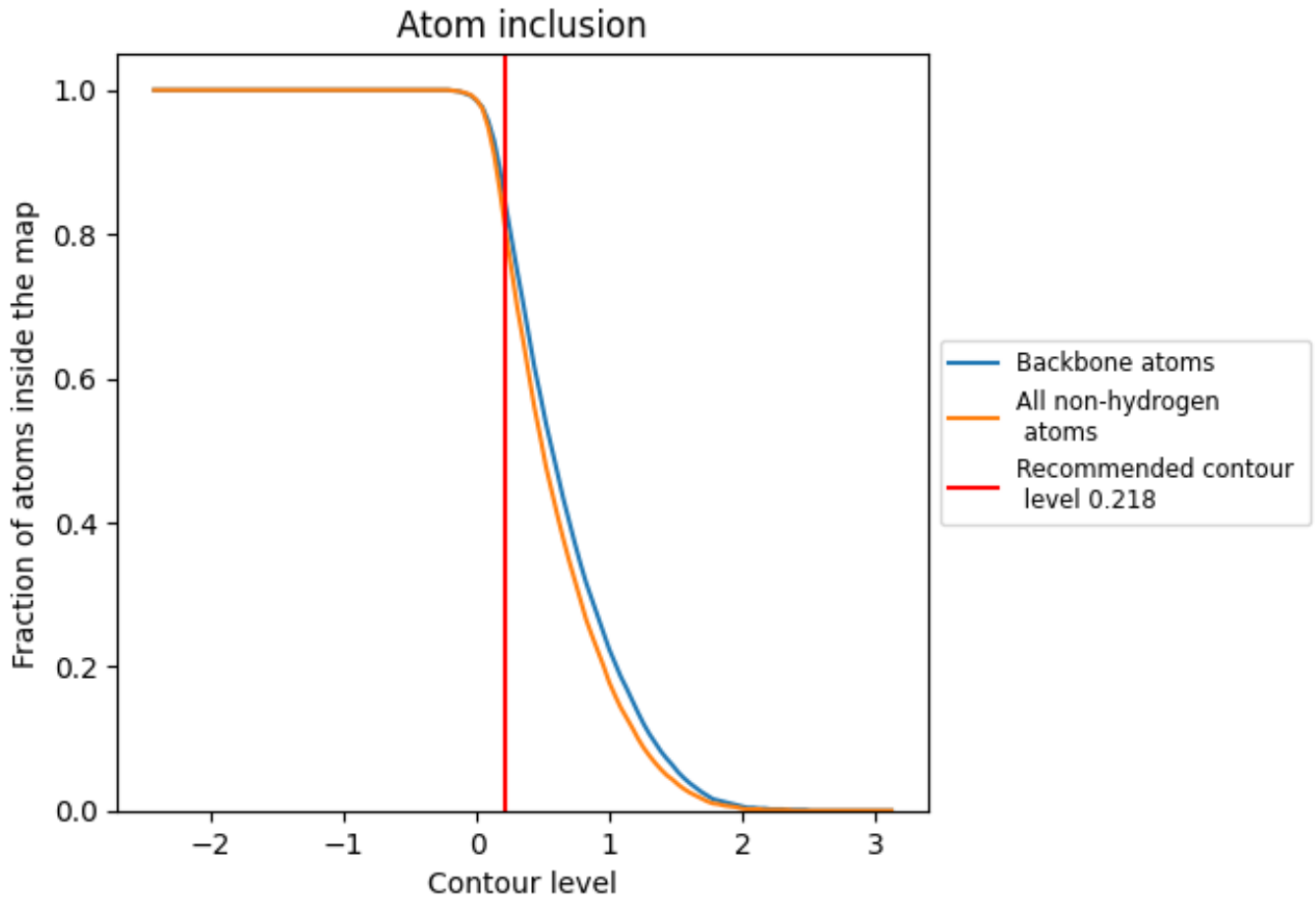
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (i)

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