



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 03:59 AM UTC

PDB ID : 6K9K / pdb_00006k9k
EMDB ID : EMD-9949
Title : Monomeric human ATM (Ataxia telangiectasia mutated) kinase
Authors : Xiao, J.; Liu, M.; Qi, Y.; Yuriy, C.; Zhang, P.; Xu, Y.
Deposited on : 2019-06-16
Resolution : 7.82 Å(reported)

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.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

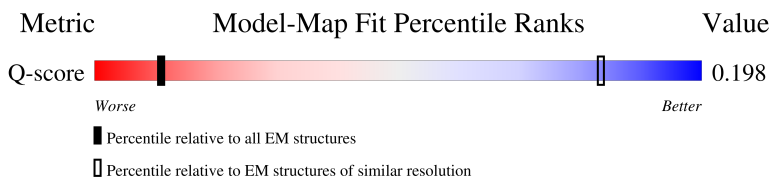
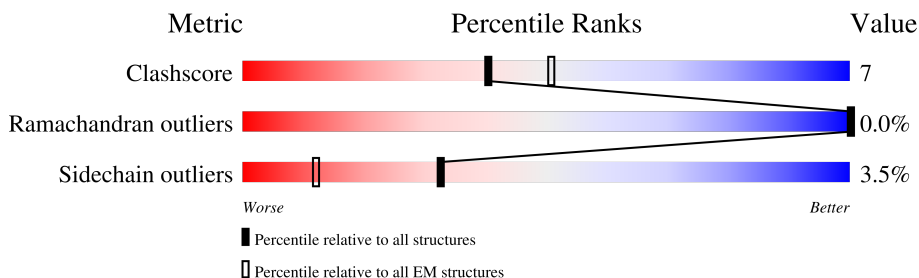
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 7.82 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	345 (7.39 - 8.30)

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	3056	

2 Entry composition

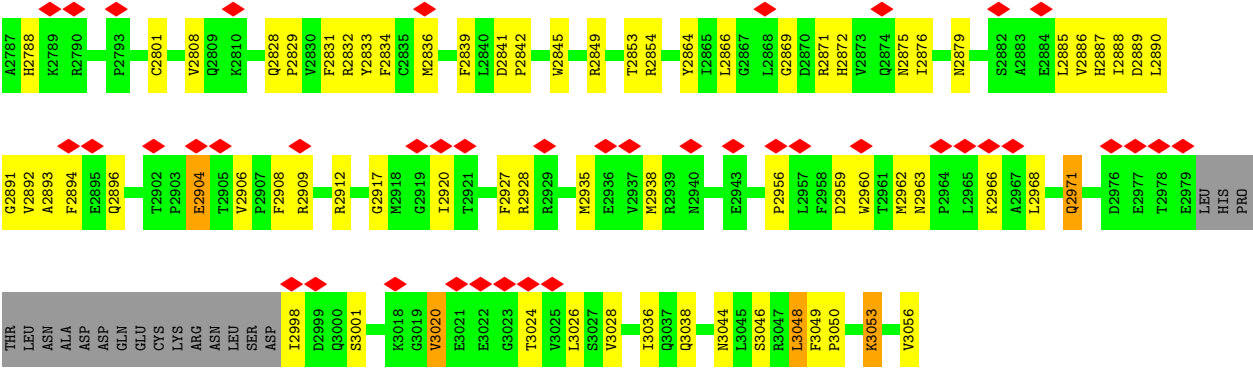
There is only 1 type of molecule in this entry. The entry contains 16507 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Serine-protein kinase ATM.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2501	Total	C	N	O	S	0	0
			16507	10270	2992	3174	71		





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	53465	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	32	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.173	Depositor
Minimum map value	-0.069	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.0498	Depositor
Map size (Å)	351.9, 351.9, 351.9	wwPDB
Map dimensions	170, 170, 170	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.07, 2.07, 2.07	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	0.11	0/16671	0.31	0/22734

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	16507	0	13328	210	0
All	All	16507	0	13328	210	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 7.

All (210) 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:2869:GLY:HA2	1:A:2892:VAL:HB	1.72	0.72
1:A:1591:LEU:HD12	1:A:1592:GLU:HG2	1.70	0.72
1:A:1625:LYS:HD3	1:A:1670:ALA:HB2	1.71	0.71
1:A:2875:ASN:HD21	1:A:2889:ASP:HA	1.54	0.71
1:A:2473:CYS:O	1:A:2477:GLY:N	2.25	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1688:ILE:HD13	1:A:2173:LEU:HB3	1.75	0.68
1:A:1519:VAL:HG21	1:A:1559:ILE:HG12	1.77	0.67
1:A:2906:VAL:HG12	1:A:2908:PHE:H	1.59	0.67
1:A:1536:LYS:NZ	1:A:1622:GLU:OE1	2.29	0.66
1:A:2263:ARG:NH2	1:A:2294:GLU:O	2.30	0.64
1:A:1482:CYS:SG	1:A:1483:ILE:N	2.70	0.63
1:A:2530:LYS:HE2	1:A:2956:PRO:HD2	1.82	0.62
1:A:1471:THR:O	1:A:1474:HIS:ND1	2.29	0.62
1:A:1564:PRO:HB3	1:A:1594:ILE:HG12	1.81	0.61
1:A:2239:MET:SD	1:A:2248:LYS:NZ	2.73	0.61
1:A:2742:ASN:ND2	1:A:2938:MET:SD	2.73	0.61
1:A:2241:ASN:HB2	1:A:2244:ARG:HG3	1.83	0.61
1:A:2525:ALA:HB2	1:A:2730:GLN:HE22	1.66	0.61
1:A:1905:SER:O	1:A:1908:THR:OG1	2.19	0.60
1:A:1251:CYS:O	1:A:1255:LEU:CB	2.50	0.59
1:A:2715:LEU:N	1:A:2767:LEU:O	2.34	0.59
1:A:2853:THR:HB	1:A:2927:PHE:HZ	1.65	0.59
1:A:2178:ALA:HB2	1:A:2226:LEU:HD13	1.85	0.59
1:A:2718:GLY:HA2	1:A:2764:SER:HA	1.84	0.59
1:A:2829:PRO:HA	1:A:2832:ARG:HB2	1.84	0.59
1:A:2638:TRP:HE1	1:A:2692:LEU:HD11	1.68	0.59
1:A:1579:GLN:NE2	1:A:1583:TYR:OH	2.35	0.58
1:A:1632:MET:HE3	1:A:1636:GLN:HE21	1.68	0.58
1:A:2613:ARG:HD2	1:A:2617:VAL:HG21	1.85	0.58
1:A:2647:ILE:HD12	1:A:2692:LEU:HD12	1.84	0.58
1:A:2890:LEU:O	1:A:2960:TRP:NE1	2.36	0.58
1:A:2198:LEU:HD22	1:A:2247:ILE:HD13	1.84	0.58
1:A:2643:LYS:HD2	1:A:2647:ILE:HG23	1.84	0.58
1:A:1633:ARG:NH2	1:A:1636:GLN:OE1	2.36	0.58
1:A:2651:GLN:NE2	1:A:2689:GLU:OE2	2.37	0.58
1:A:1925:GLY:HA3	1:A:1928:PHE:HD2	1.69	0.57
1:A:2748:ARG:O	1:A:2854:ARG:NH2	2.35	0.57
1:A:2188:LEU:HD21	1:A:2201:VAL:HG21	1.86	0.57
1:A:1592:GLU:HB3	1:A:1595:ASN:HB2	1.86	0.57
1:A:1751:GLU:O	1:A:1754:LYS:NZ	2.34	0.57
1:A:1714:MET:SD	1:A:1714:MET:N	2.78	0.56
1:A:2692:LEU:HD13	1:A:2698:LEU:HB3	1.86	0.56
1:A:1931:ALA:HA	1:A:1936:LEU:HD21	1.87	0.55
1:A:1581:ILE:HG12	1:A:1629:VAL:HG13	1.89	0.55
1:A:2697:ASN:ND2	1:A:2720:ASP:OD2	2.39	0.55
1:A:1404:ILE:HG13	1:A:1408:LEU:HD12	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2749:LYS:O	1:A:2854:ARG:NH2	2.38	0.55
1:A:1807:LYS:O	1:A:1810:THR:OG1	2.23	0.55
1:A:2224:MET:HE1	1:A:2258:LEU:HB3	1.88	0.55
1:A:2748:ARG:HG3	1:A:2750:LEU:HG	1.88	0.55
1:A:1899:CYS:HB2	1:A:1903:LYS:HG3	1.89	0.55
1:A:1732:ALA:HB1	1:A:1853:ASP:HB3	1.89	0.55
1:A:2833:TYR:HA	1:A:2836:MET:HB2	1.89	0.55
1:A:2959:ASP:HA	1:A:2963:ASN:HB2	1.89	0.55
1:A:2697:ASN:ND2	1:A:2718:GLY:O	2.40	0.54
1:A:1452:ASP:H	1:A:1461:TRP:HH2	1.55	0.54
1:A:1475:TYR:O	1:A:1479:ARG:NE	2.34	0.54
1:A:2138:ARG:NH1	1:A:2240:ASP:OD2	2.41	0.54
1:A:2126:GLU:O	1:A:2130:ASN:ND2	2.40	0.54
1:A:2634:ASP:OD1	1:A:2654:THR:OG1	2.25	0.54
1:A:1716:THR:OG1	1:A:1844:TYR:OH	2.23	0.54
1:A:1744:LYS:HD3	1:A:1770:SER:H	1.73	0.54
1:A:2808:VAL:HG11	1:A:3050:PRO:HG3	1.91	0.53
1:A:2872:HIS:H	1:A:2875:ASN:HB3	1.73	0.53
1:A:2231:LEU:HD23	1:A:2251:LEU:HD22	1.91	0.53
1:A:1590:LEU:O	1:A:1592:GLU:N	2.42	0.53
1:A:1890:ASP:HA	1:A:1907:ARG:HH21	1.74	0.53
1:A:2971:GLN:O	1:A:2971:GLN:NE2	2.41	0.53
1:A:1614:LEU:O	1:A:1618:ARG:HG2	2.09	0.52
1:A:2831:PHE:HA	1:A:2834:PHE:HB2	1.89	0.52
1:A:1612:GLU:CD	1:A:1612:GLU:H	2.15	0.52
1:A:2292:GLN:HG3	1:A:2315:MET:HG3	1.91	0.52
1:A:2839:PHE:C	1:A:2841:ASP:H	2.17	0.52
1:A:1480:PRO:HA	1:A:1484:MET:HG2	1.92	0.51
1:A:1688:ILE:HB	1:A:2173:LEU:HD13	1.91	0.51
1:A:1713:ILE:O	1:A:1716:THR:OG1	2.24	0.51
1:A:1466:ARG:NH2	1:A:1470:TYR:OH	2.43	0.51
1:A:1578:GLN:HG3	1:A:1620:GLN:HG2	1.91	0.51
1:A:2172:THR:HA	1:A:2175:ARG:HD2	1.91	0.51
1:A:1841:VAL:HG12	1:A:1843:PRO:HD2	1.92	0.51
1:A:2314:GLN:HG2	1:A:2318:LYS:HE2	1.93	0.51
1:A:2705:VAL:HG22	1:A:2711:GLU:HG2	1.93	0.51
1:A:2127:SER:HA	1:A:2130:ASN:HD21	1.75	0.50
1:A:2828:GLN:OE1	1:A:2832:ARG:NH1	2.44	0.50
1:A:3046:SER:HA	1:A:3053:LYS:HD2	1.94	0.50
1:A:1415:TYR:CZ	1:A:1419:LEU:HD11	2.47	0.50
1:A:2667:MET:HG3	1:A:2681:VAL:HB	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1667:VAL:HG21	1:A:1682:ASP:HB2	1.93	0.50
1:A:2624:CYS:HA	1:A:2627:TYR:CZ	2.46	0.50
1:A:1644:MET:SD	1:A:1644:MET:N	2.72	0.50
1:A:1724:GLU:HB3	1:A:1740:ILE:HD11	1.94	0.49
1:A:1996:GLU:N	1:A:2000:SER:OG	2.45	0.49
1:A:2188:LEU:HD11	1:A:2201:VAL:HG11	1.94	0.49
1:A:2546:SER:HA	1:A:2610:ARG:HH21	1.77	0.49
1:A:2842:PRO:HD2	1:A:2845:TRP:HB2	1.94	0.49
1:A:2298:VAL:HA	1:A:2302:LYS:HE3	1.93	0.49
1:A:2241:ASN:H	1:A:2244:ARG:HD2	1.78	0.49
1:A:2299:PHE:HE1	1:A:2307:LEU:H	1.61	0.49
1:A:2625:ASP:HA	1:A:2628:ILE:HG12	1.95	0.49
1:A:2650:ASP:OD1	1:A:2650:ASP:N	2.46	0.48
1:A:2904:GLU:HG2	1:A:3048:LEU:HA	1.94	0.48
1:A:1402:LYS:H	1:A:1402:LYS:HD2	1.77	0.48
1:A:2210:GLN:HA	1:A:2213:LYS:HE3	1.95	0.48
1:A:1543:LYS:NZ	1:A:1626:ASP:O	2.42	0.48
1:A:1923:SER:OG	1:A:1929:ASN:OD1	2.28	0.48
1:A:2138:ARG:HG2	1:A:2237:LYS:HD3	1.95	0.48
1:A:1814:LEU:HD23	1:A:1885:THR:HG23	1.96	0.48
1:A:2532:MET:HG3	1:A:2598:ARG:HB2	1.96	0.48
1:A:2215:SER:OG	1:A:2220:GLN:NE2	2.38	0.48
1:A:2745:THR:HG22	1:A:2750:LEU:HD12	1.95	0.48
1:A:1412:PRO:HA	1:A:1415:TYR:HB3	1.95	0.48
1:A:1620:GLN:HA	1:A:1623:LEU:HD23	1.96	0.48
1:A:1440:LYS:O	1:A:1443:HIS:ND1	2.39	0.47
1:A:1549:ASN:H	1:A:1552:ASN:HD22	1.62	0.47
1:A:2715:LEU:HB2	1:A:2767:LEU:HB2	1.96	0.47
1:A:2338:LEU:HD22	1:A:2363:LYS:HG2	1.96	0.47
1:A:3050:PRO:HA	1:A:3053:LYS:HE2	1.96	0.47
1:A:1658:ALA:HA	1:A:1661:HIS:HD2	1.78	0.47
1:A:2725:ASP:HB3	1:A:2890:LEU:HD22	1.96	0.47
1:A:2849:ARG:NH1	1:A:2917:GLY:O	2.48	0.47
1:A:1748:SER:HA	1:A:1752:ILE:HB	1.96	0.47
1:A:1819:THR:HA	1:A:1897:PHE:HB3	1.96	0.47
1:A:1618:ARG:HH22	1:A:1659:ILE:HG23	1.79	0.47
1:A:1837:PHE:HA	1:A:1845:LEU:HD22	1.96	0.47
1:A:2526:ARG:O	1:A:2529:THR:OG1	2.24	0.46
1:A:1807:LYS:HE3	1:A:1877:PHE:HB3	1.98	0.46
1:A:2719:ARG:N	1:A:2763:ARG:O	2.48	0.46
1:A:2998:ILE:HG22	1:A:3001:SER:H	1.79	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1837:PHE:HB2	1:A:1845:LEU:HD13	1.97	0.46
1:A:2788:HIS:HB2	1:A:2834:PHE:HE1	1.80	0.46
1:A:2853:THR:HB	1:A:2927:PHE:CZ	2.49	0.46
1:A:1729:VAL:HG12	1:A:1730:ARG:HG3	1.97	0.45
1:A:1418:ILE:O	1:A:1422:ILE:HG13	2.16	0.45
1:A:1578:GLN:OE1	1:A:1578:GLN:N	2.48	0.45
1:A:1480:PRO:HB2	1:A:1527:LEU:HD12	1.98	0.45
1:A:1710:TRP:HZ2	1:A:1755:MET:H	1.63	0.45
1:A:2293:LEU:HD11	1:A:2337:CYS:SG	2.57	0.45
1:A:1823:ILE:HA	1:A:1826:LEU:HB3	1.97	0.45
1:A:2649:ALA:HA	1:A:2689:GLU:HG2	1.97	0.45
1:A:2683:ILE:HA	1:A:2706:GLY:HA2	1.97	0.45
1:A:2893:ALA:HB3	1:A:2896:GLN:HG3	1.99	0.45
1:A:1831:CYS:O	1:A:1834:LYS:HG2	2.17	0.45
1:A:1996:GLU:O	1:A:2000:SER:OG	2.25	0.45
1:A:2600:GLU:HA	1:A:2603:ASN:ND2	2.31	0.45
1:A:2845:TRP:CD1	1:A:2849:ARG:HG2	2.52	0.45
1:A:2220:GLN:O	1:A:2224:MET:N	2.42	0.45
1:A:3020:VAL:HG21	1:A:3026:LEU:HB2	1.98	0.44
1:A:2299:PHE:HB3	1:A:2305:GLN:HG2	1.99	0.44
1:A:1710:TRP:CE3	1:A:1714:MET:HB3	2.52	0.44
1:A:1713:ILE:HD12	1:A:1844:TYR:HE2	1.82	0.44
1:A:2516:PHE:O	1:A:2520:MET:N	2.42	0.44
1:A:1631:ILE:HG23	1:A:1681:ILE:HA	1.98	0.44
1:A:1744:LYS:HD3	1:A:1769:THR:HB	1.99	0.44
1:A:2135:LEU:C	1:A:2237:LYS:HZ1	2.24	0.44
1:A:1555:LEU:O	1:A:1559:ILE:HG13	2.17	0.44
1:A:2314:GLN:HA	1:A:2317:LYS:HG2	2.00	0.44
1:A:1904:LYS:O	1:A:1908:THR:HG23	2.18	0.44
1:A:2656:LEU:HD23	1:A:2656:LEU:HA	1.90	0.44
1:A:2704:CYS:HB2	1:A:2712:ARG:HB2	2.00	0.44
1:A:2828:GLN:HA	1:A:2831:PHE:CZ	2.53	0.43
1:A:2271:PRO:HB2	1:A:2297:GLN:OE1	2.17	0.43
1:A:2278:ILE:O	1:A:2283:SER:OG	2.35	0.43
1:A:2879:ASN:HD21	1:A:2886:VAL:H	1.67	0.43
1:A:2714:GLN:HG2	1:A:2768:GLU:HG2	2.01	0.43
1:A:2699:PRO:HB3	1:A:2717:LYS:HG2	1.99	0.43
1:A:2871:ARG:HB3	1:A:2876:ILE:HD11	2.01	0.43
1:A:1868:GLY:HA2	1:A:1909:MET:HE1	2.01	0.43
1:A:2170:TYR:N	1:A:2171:PRO:HD2	2.34	0.43
1:A:1710:TRP:HB3	1:A:1714:MET:HB2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1745:THR:O	1:A:1748:SER:OG	2.34	0.42
1:A:2248:LYS:HA	1:A:2251:LEU:HD12	2.01	0.42
1:A:1743:THR:HG22	1:A:1847:HIS:CE1	2.53	0.42
1:A:1852:GLN:HA	1:A:1859:ARG:HH12	1.84	0.42
1:A:2238:GLU:HA	1:A:2244:ARG:HD3	2.01	0.42
1:A:2928:ARG:HE	1:A:3036:ILE:HD12	1.85	0.42
1:A:2299:PHE:HD1	1:A:2305:GLN:HA	1.84	0.42
1:A:1497:LEU:HD21	1:A:1730:ARG:HE	1.85	0.42
1:A:2299:PHE:HZ	1:A:2308:ALA:HB3	1.85	0.42
1:A:2935:MET:HB2	1:A:3028:VAL:HG11	2.01	0.41
1:A:1476:ILE:HG23	1:A:1479:ARG:NH2	2.35	0.41
1:A:1712:PHE:HD2	1:A:1713:ILE:HG12	1.85	0.41
1:A:1648:VAL:HA	1:A:1651:LEU:HG	2.01	0.41
1:A:1762:ALA:HA	1:A:1766:PRO:HD3	2.02	0.41
1:A:2244:ARG:HA	1:A:2247:ILE:HD12	2.02	0.41
1:A:1712:PHE:HB3	1:A:1714:MET:SD	2.61	0.41
1:A:1606:LEU:O	1:A:1608:LEU:N	2.47	0.41
1:A:2667:MET:O	1:A:2670:LYS:HG3	2.21	0.41
1:A:2906:VAL:HG13	1:A:3044:ASN:HB3	2.02	0.41
1:A:3038:GLN:O	1:A:3044:ASN:ND2	2.35	0.41
1:A:2624:CYS:HA	1:A:2627:TYR:CE1	2.55	0.41
1:A:2864:TYR:OH	1:A:2909:ARG:HG3	2.21	0.41
1:A:961:LEU:O	1:A:963:MET:N	2.54	0.41
1:A:2876:ILE:HG23	1:A:2887:HIS:CE1	2.55	0.41
1:A:1551:ASP:O	1:A:1555:LEU:HG	2.20	0.41
1:A:2885:LEU:HB3	1:A:2887:HIS:CE1	2.56	0.41
1:A:1832:GLU:O	1:A:1835:THR:OG1	2.39	0.41
1:A:2600:GLU:HA	1:A:2603:ASN:HD21	1.85	0.41
1:A:2866:LEU:HA	1:A:2894:PHE:CZ	2.56	0.41
1:A:2238:GLU:HB3	1:A:2244:ARG:HB3	2.02	0.41
1:A:2775:PRO:HG2	1:A:2778:GLU:OE1	2.21	0.41
1:A:1710:TRP:HH2	1:A:1756:THR:HG23	1.85	0.40
1:A:2891:GLY:HA2	1:A:2960:TRP:HE1	1.85	0.40
1:A:1523:THR:HG22	1:A:1562:LEU:HD21	2.02	0.40
1:A:1806:ILE:O	1:A:1810:THR:HG23	2.22	0.40
1:A:1810:THR:HA	1:A:1813:PHE:HB3	2.03	0.40
1:A:1402:LYS:HE3	1:A:1402:LYS:HB3	1.92	0.40
1:A:1737:LEU:HA	1:A:1740:ILE:HD12	2.03	0.40
1:A:3048:LEU:HD23	1:A:3049:PHE:H	1.86	0.40
1:A:1879:GLN:HG3	1:A:1880:THR:HG23	2.04	0.40
1:A:2912:ARG:NH2	1:A:3056:VAL:O	2.55	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	2441/3056 (80%)	2244 (92%)	196 (8%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1591	LEU

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1200/2780 (43%)	1158 (96%)	42 (4%)	32	53

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1402	LYS
1	A	1410	LYS
1	A	1425	GLN
1	A	1437	ARG
1	A	1443	HIS
1	A	1445	PHE
1	A	1472	LEU

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Mol	Chain	Res	Type
1	A	1483	ILE
1	A	1570	VAL
1	A	1579	GLN
1	A	1588	PHE
1	A	1612	GLU
1	A	1644	MET
1	A	1666	GLU
1	A	1688	ILE
1	A	1708	LEU
1	A	1761	LEU
1	A	1809	LEU
1	A	1814	LEU
1	A	1859	ARG
1	A	1901	LEU
1	A	1921	ARG
1	A	1946	GLN
1	A	2139	GLU
1	A	2140	PHE
1	A	2371	TYR
1	A	2650	ASP
1	A	2664	VAL
1	A	2727	VAL
1	A	2771	THR
1	A	2801	CYS
1	A	2888	ILE
1	A	2904	GLU
1	A	2920	ILE
1	A	2962	MET
1	A	2966	LYS
1	A	2968	LEU
1	A	2971	GLN
1	A	3020	VAL
1	A	3024	THR
1	A	3048	LEU
1	A	3053	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1518	HIS
1	A	1531	GLN
1	A	1537	GLN

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Mol	Chain	Res	Type
1	A	1552	ASN
1	A	1568	HIS
1	A	1579	GLN
1	A	1638	ASN
1	A	1661	HIS
1	A	1765	GLN
1	A	1847	HIS
1	A	1867	GLN
1	A	1937	ASN
1	A	1970	GLN
1	A	2177	GLN
1	A	2254	HIS
1	A	2282	ASN
1	A	2326	ASN
1	A	2697	ASN
1	A	2730	GLN
1	A	2872	HIS
1	A	2874	GLN
1	A	2875	ASN
1	A	2879	ASN
1	A	2887	HIS
1	A	2896	GLN
1	A	2963	ASN
1	A	2971	GLN

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 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.

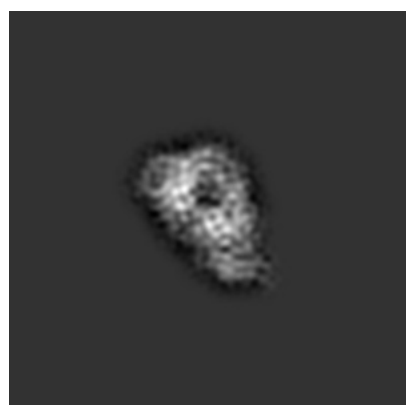
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9949. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

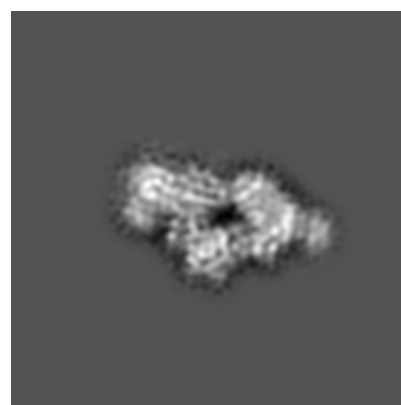
6.1.1 Primary map



X



Y



Z

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

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 85



Y Index: 85



Z Index: 85

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: 77



Y Index: 74



Z Index: 91

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

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

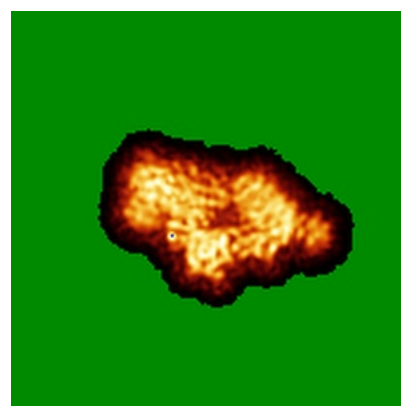
6.4.1 Primary map



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

This section was not generated.

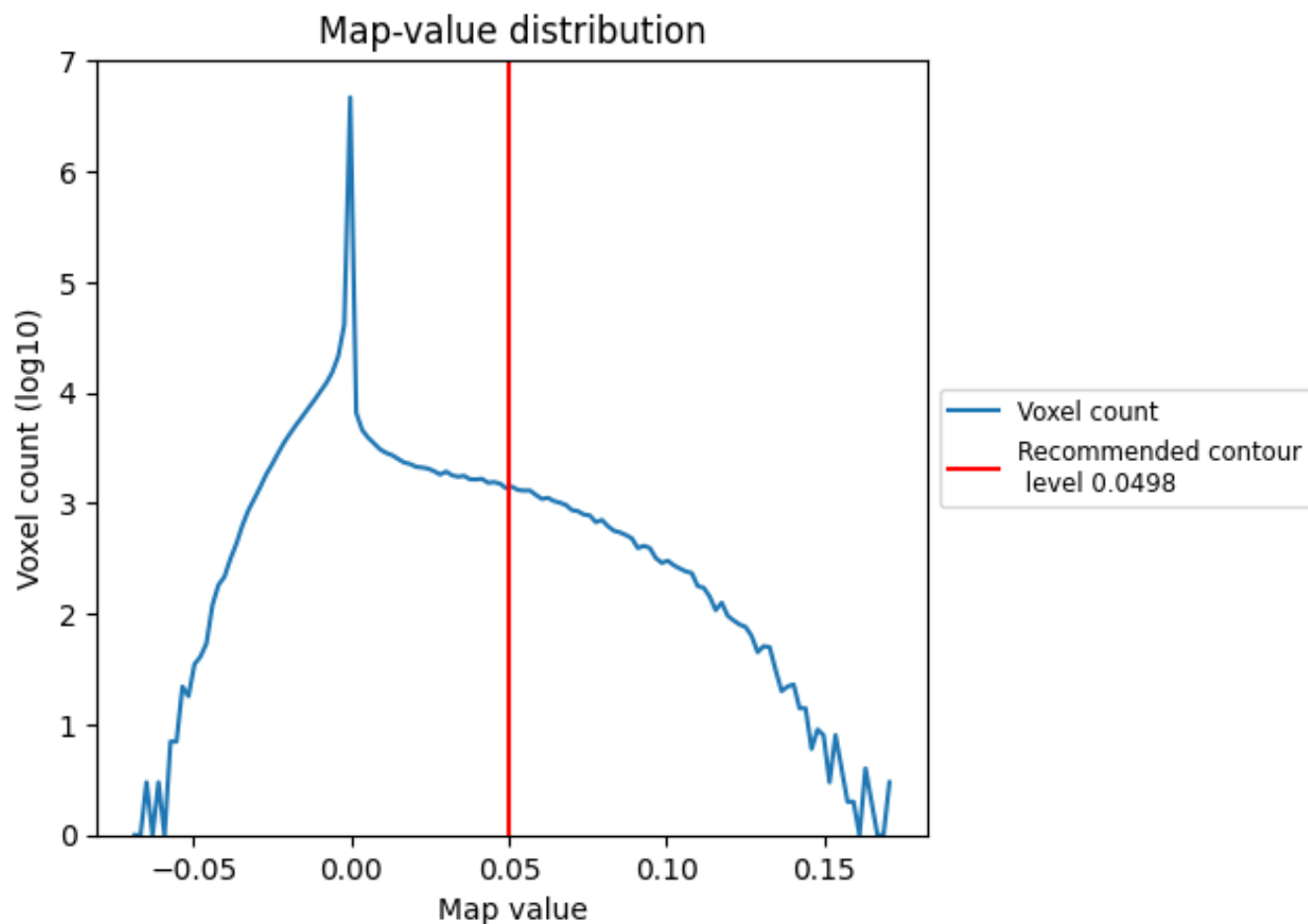
6.6 Mask visualisation

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

7 Map analysis [i](#)

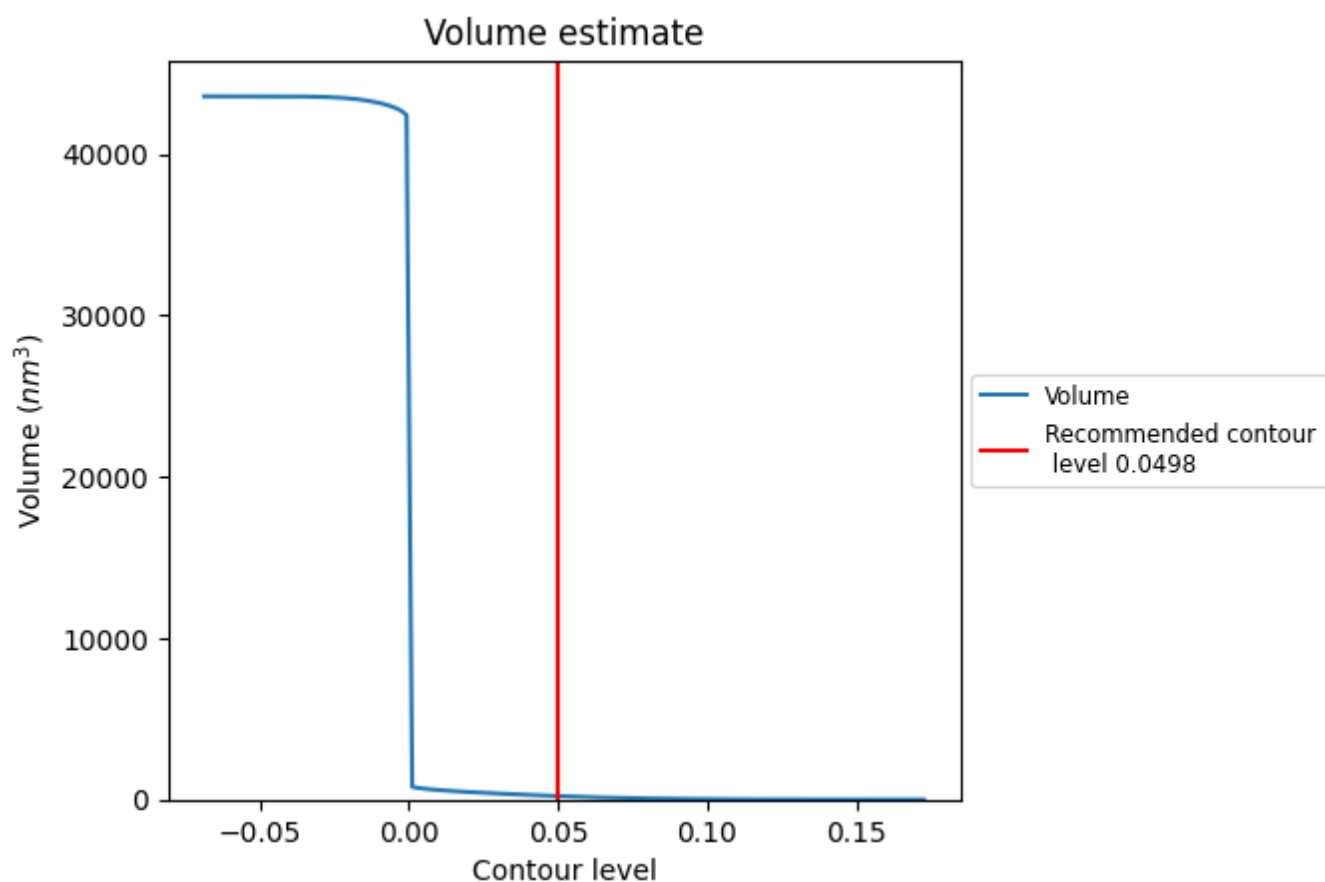
This section contains the results of statistical analysis of the map.

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.

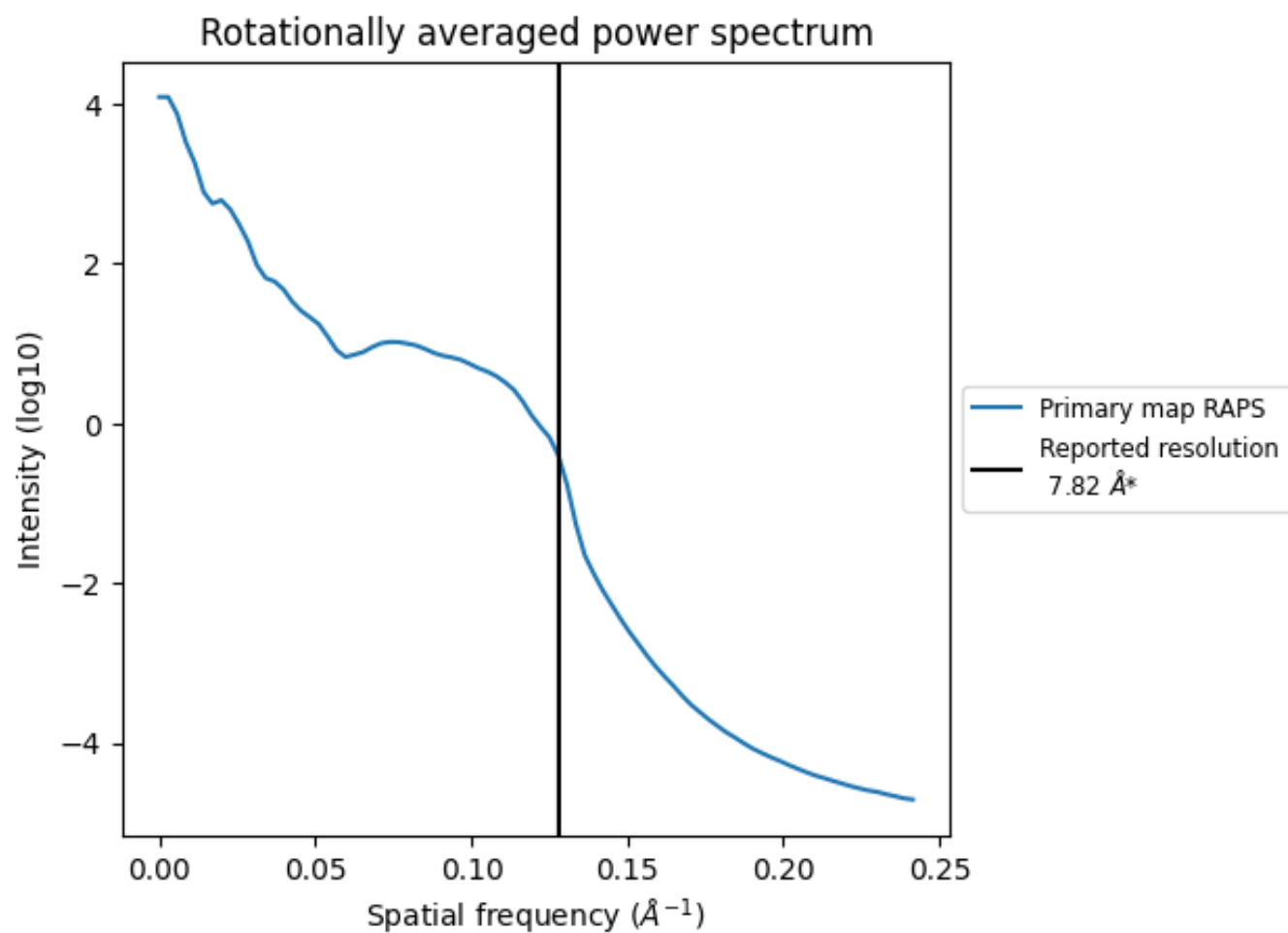
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 218 nm³; this corresponds to an approximate mass of 197 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 0.128 Å⁻¹

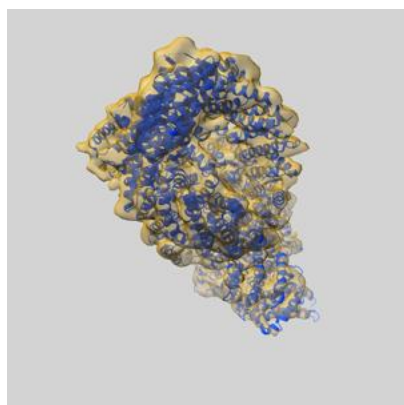
8 Fourier-Shell correlation

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

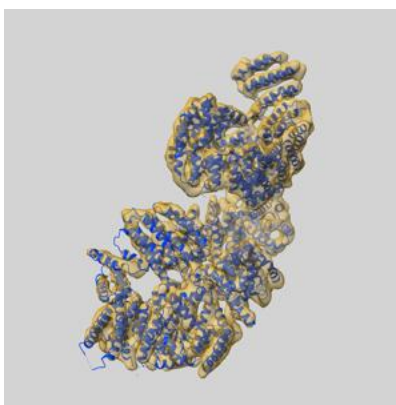
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-9949 and PDB model 6K9K. Per-residue inclusion information can be found in section [3](#) on page [4](#).

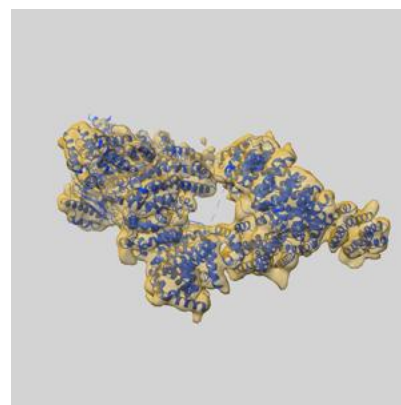
9.1 Map-model overlay [i](#)



X



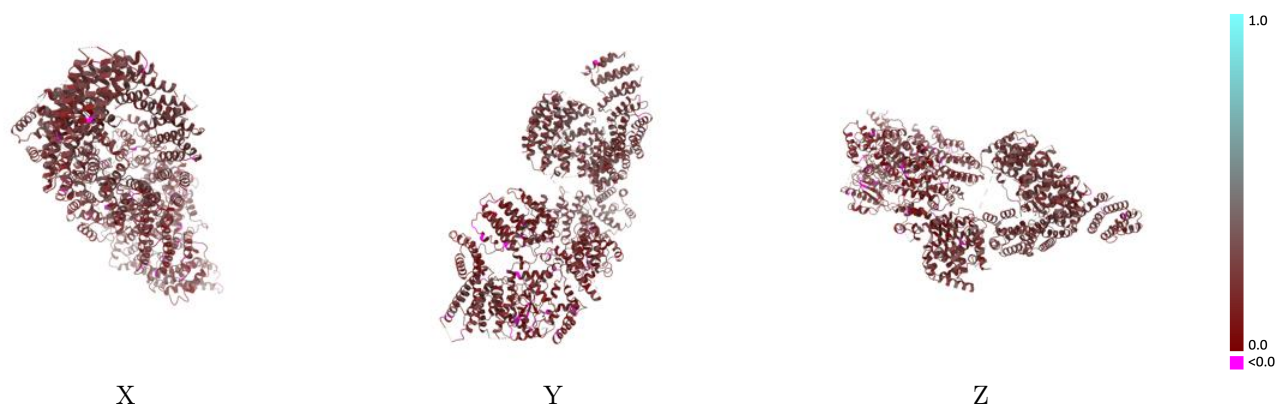
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0498 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](#)

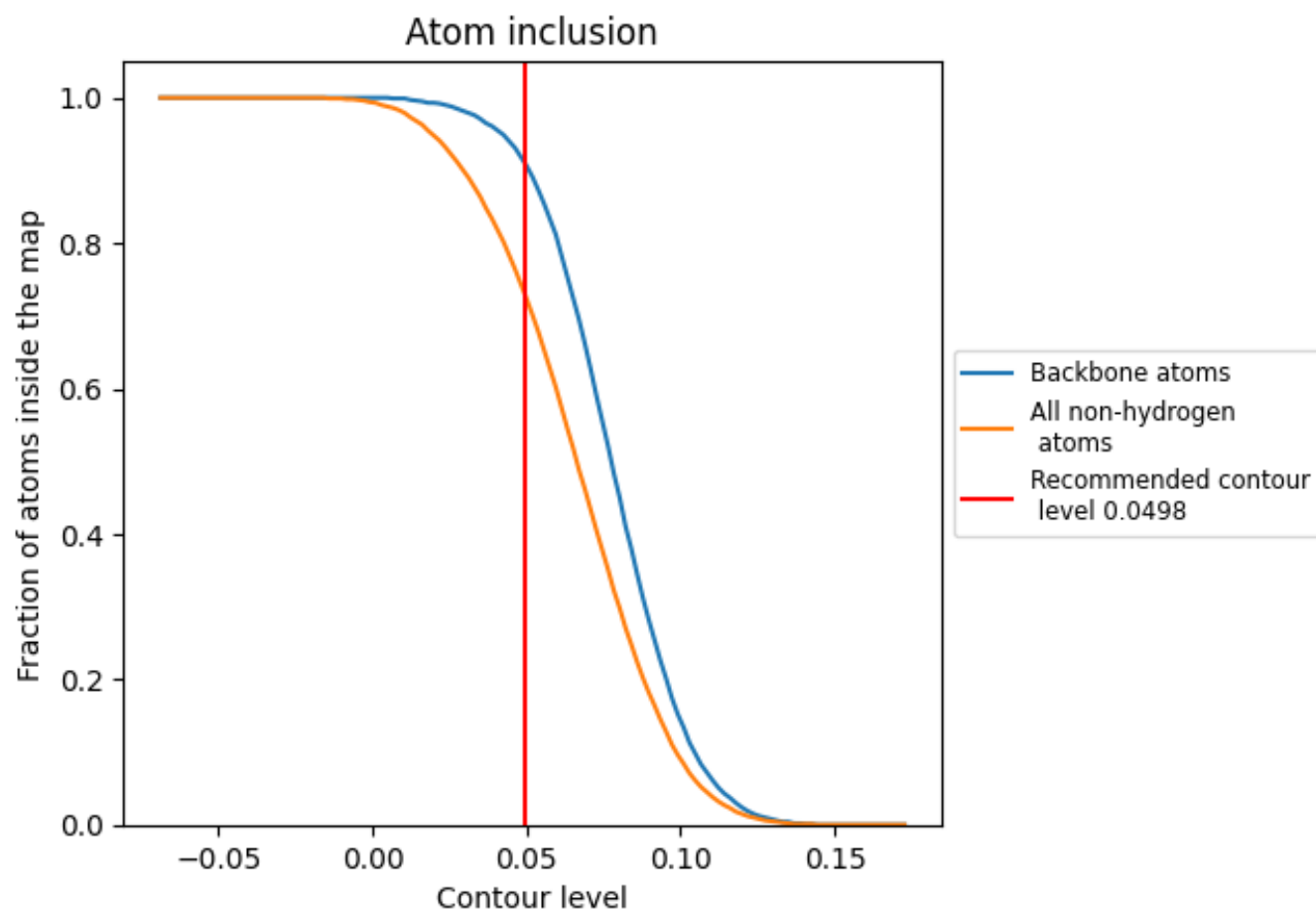


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

This section was not generated.

9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 73% 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 (0.0498) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7260	0.1980
A	0.7260	0.1980

