Full wwPDB EM Validation Report ⓘ

Jun 17, 2025 – 04:43 PM JST

PDB ID	:	8KI9 / pdb_00008ki9
EMDB ID	:	EMD-37255
Title	:	Structure of Tomato spotted wilt virus L protein contained CTD
Authors	:	Cao, L.; Wang, L.
Deposited on	:	2023-08-23
Resolution	:	4.00 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:

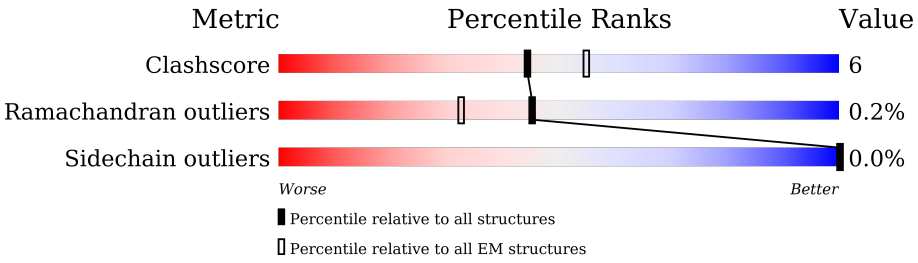
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 4.00 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	2441	23% 76% 16% 8%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 18082 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 L protein.

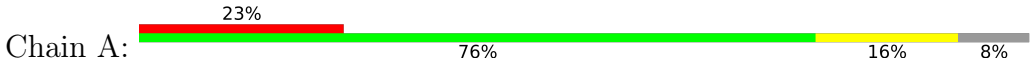
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2238	18082	11542	2997	3422	121	0	0

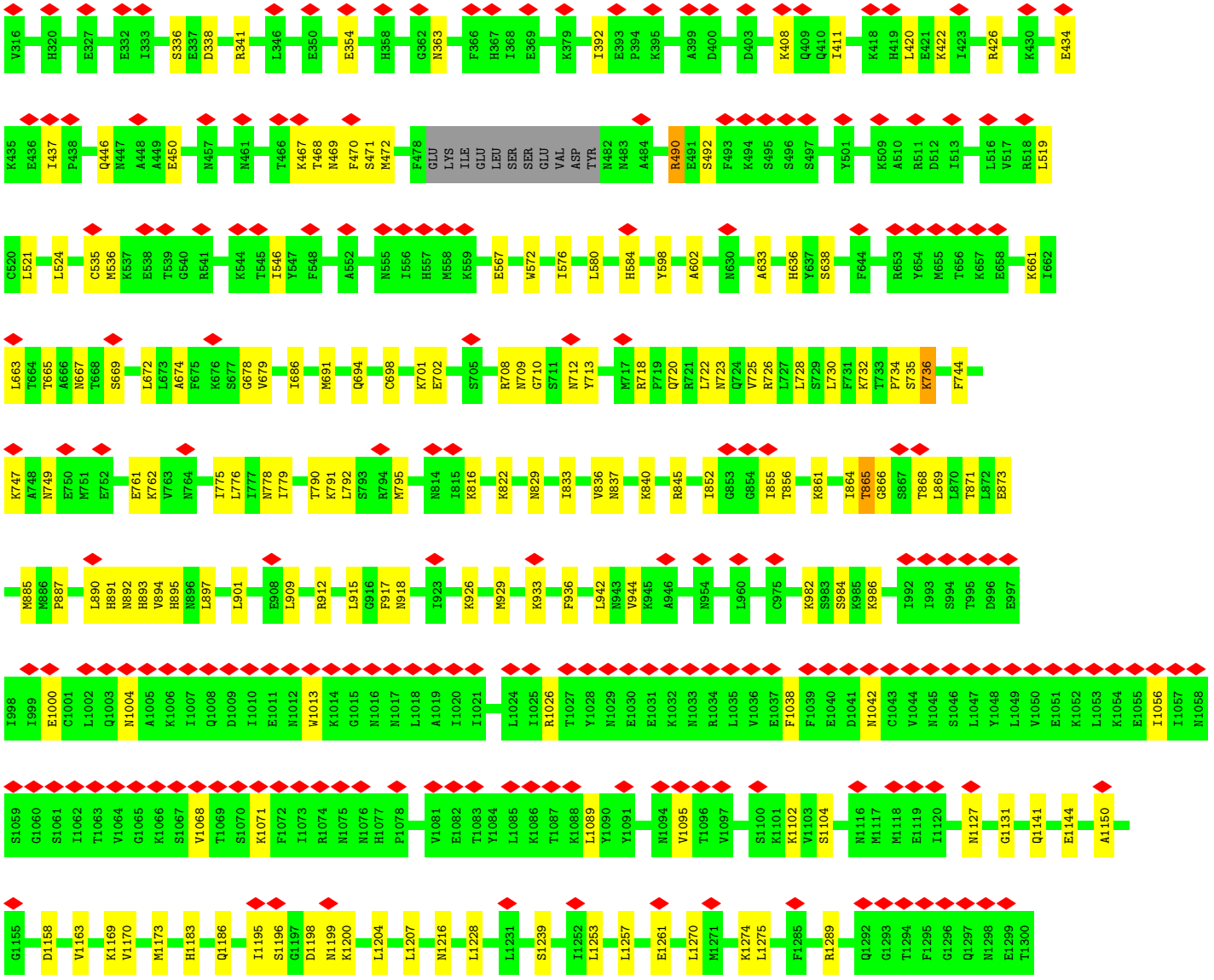
3 Residue-property plots (i)

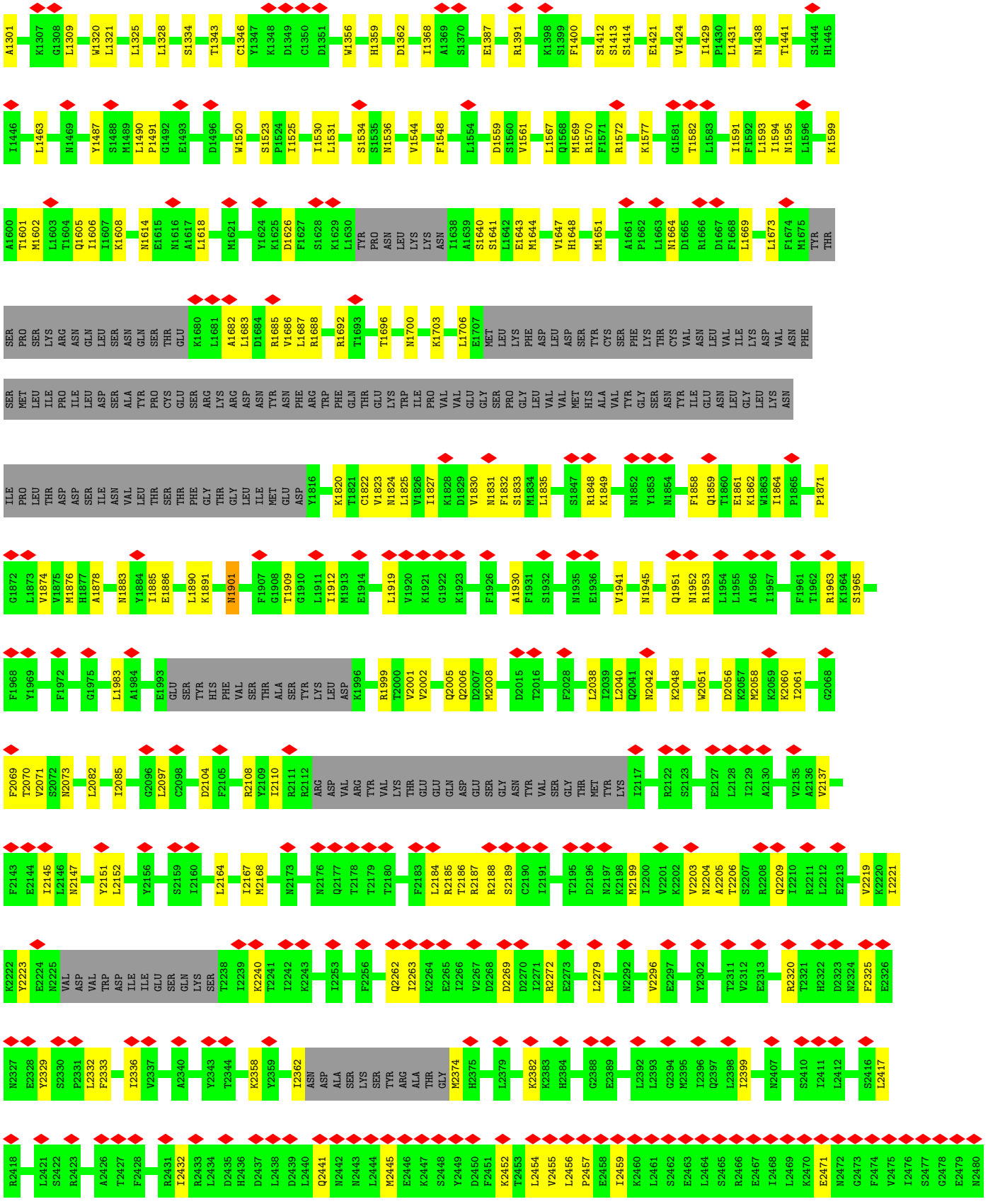
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

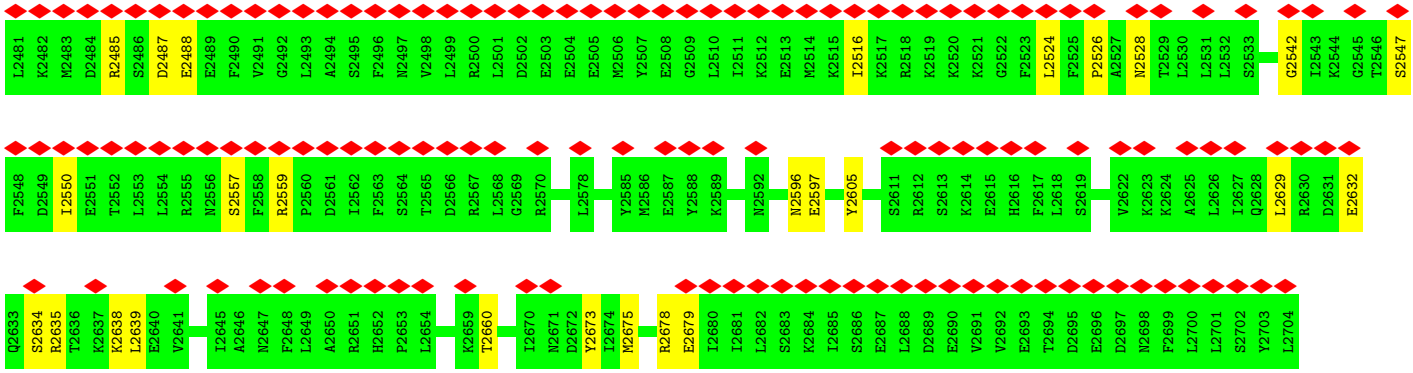
- Molecule 1: L protein

Chain A:








L2481 K2482 M2483 D2484 R2485 S2486 D2487 E2488 E2489 F2490 V2491 G2492 L2493 A2494 S2495 F2496 N2497 V2498 L2499 R2500 L2501 D2502 E2503 E2504 E2505 M2506 Y2507 E2508 G2509 L2510 I2511 K2512 E2513 M2514 K2515 I2516 K2517 R2518 K2519 K2520 K2521 G2522 F2523 L2524 F2525 P2526 A2527 N2528 T2529 L2530 L2531 L2532 S2533 G2542 I2543 K2544 G2545 T2546 S2547
F2548 D2549 I2550 E2551 T2552 L2553 L2554 R2555 N2556 S2557 F2558 R2559 P2560 D2561 I2562 F2563 S2564 T2565 D2566 R2567 L2568 G2569 R2570 L2578 Y2585 M2586 E2587 Y2588 K2589 N2592 N2596 E2597 Y2605 S2611 R2612 S2613 K2614 E2615 H2616 F2617 L2618 S2619 V2622 K2623 K2624 A2625 L2626 I2627 Q2628 L2629 R2630 D2631 E2632
Q2633 S2634 R2635 T2636 K2637 K2638 L2639 E2640 Y2641 I2645 A2646 N2647 F2648 L2649 A2650 R2651 H2652 P2653 L2654 K2659 T2660 I2670 N2671 D2672 Y2673 I2674 M2675 R2678 E2679 I2680 I2681 L2682 S2683 K2684 I2685 S2686 E2687 L2688 D2689 E2690 V2691 Y2692 E2693 T2694 D2695 E2696 D2697 N2698 F2699 L2700 L2701 S2702 Y2703 L2704

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	61445	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	60	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	2.290	Depositor
Minimum map value	-0.002	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.036	Depositor
Recommended contour level	0.087	Depositor
Map size (Å)	273.92, 273.92, 273.92	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	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	0.23	0/18394	0.60	3/24780 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	7

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	567	GLU	CA-C-N	5.67	132.38	121.54
1	A	567	GLU	C-N-CA	5.67	132.38	121.54
1	A	736	LYS	CB-CG-CD	5.45	123.83	111.30

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1952	ASN	Peptide
1	A	2296	VAL	Peptide
1	A	2485	ARG	Peptide
1	A	2488	GLU	Peptide
1	A	490	ARG	Sidechain
1	A	678	GLY	Peptide
1	A	894	VAL	Peptide

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	18082	0	18295	227	0
All	All	18082	0	18295	227	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 6.

All (227) 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:1901:ASN:C	1:A:1901:ASN:HD22	1.88	0.81
1:A:1544:VAL:HG21	1:A:1593:LEU:HD13	1.78	0.65
1:A:912:ARG:HG3	1:A:917:PHE:HB2	1.79	0.64
1:A:1951:GLN:O	1:A:1953:ARG:NH1	2.29	0.64
1:A:1334:SER:OG	1:A:1356:TRP:NE1	2.31	0.64
1:A:1859:GLN:NE2	1:A:1878:ALA:O	2.30	0.64
1:A:1257:LEU:HB3	1:A:1261:GLU:HG3	1.79	0.64
1:A:1641:SER:HA	1:A:1644:MET:HE2	1.80	0.64
1:A:422:LYS:HZ3	1:A:426:ARG:HH22	1.45	0.63
1:A:1999:ARG:NH2	1:A:2374:MET:SD	2.72	0.62
1:A:2325:PHE:HB3	1:A:2329:TYR:HB2	1.82	0.62
1:A:472:MET:HE1	1:A:730:LEU:HD11	1.82	0.62
1:A:701:LYS:O	1:A:718:ARG:NH1	2.33	0.61
1:A:873:GLU:HG2	1:A:1429:ILE:HD12	1.83	0.61
1:A:472:MET:O	1:A:720:GLN:NE2	2.34	0.61
1:A:1858:PHE:HA	1:A:1862:LYS:HE2	1.82	0.61
1:A:2145:ILE:HG21	1:A:2223:TYR:HB3	1.81	0.60
1:A:1438:ASN:HA	1:A:1441:THR:HG22	1.82	0.60
1:A:1289:ARG:NH1	1:A:1309:LEU:O	2.35	0.60
1:A:1569:MET:HA	1:A:1572:ARG:HG2	1.84	0.60
1:A:437:ILE:HB	1:A:816:LYS:HD2	1.84	0.60
1:A:2635:ARG:HH12	1:A:2639:LEU:HB2	1.66	0.59
1:A:665:THR:HG23	1:A:667:ASN:H	1.67	0.59
1:A:1548:PHE:O	1:A:1570:ARG:NH2	2.36	0.58
1:A:2164:LEU:HA	1:A:2167:ILE:HG12	1.86	0.58
1:A:492:SER:O	1:A:709:ASN:ND2	2.34	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:679:VAL:HB	1:A:722:LEU:HB2	1.87	0.57
1:A:1864:ILE:HD11	1:A:1876:MET:HA	1.86	0.57
1:A:1195:ILE:HA	1:A:1200:LYS:HD2	1.87	0.57
1:A:1700:ASN:HA	1:A:1703:LYS:HG2	1.86	0.57
1:A:1849:LYS:HD2	1:A:1861:GLU:HG2	1.86	0.57
1:A:467:LYS:HB2	1:A:829:ASN:HD21	1.69	0.56
1:A:1871:PRO:HG3	1:A:2320:ARG:HE	1.70	0.56
1:A:446:GLN:NE2	1:A:450:GLU:OE2	2.39	0.56
1:A:1490:LEU:HD12	1:A:1491:PRO:HD2	1.86	0.56
1:A:354:GLU:HG3	1:A:392:ILE:HD12	1.88	0.56
1:A:420:LEU:HD22	1:A:1346:CYS:HB3	1.88	0.56
1:A:1325:LEU:HD21	1:A:1328:LEU:HD23	1.87	0.55
1:A:726:ARG:NH1	1:A:790:THR:O	2.39	0.55
1:A:2056:ASP:O	1:A:2060:LYS:NZ	2.39	0.55
1:A:856:THR:HG21	1:A:871:THR:HA	1.89	0.55
1:A:1150:ALA:HB3	1:A:1169:LYS:HE3	1.88	0.55
1:A:855:ILE:HD12	1:A:2673:TYR:HE1	1.72	0.55
1:A:1523:SER:HB3	1:A:1536:ASN:HB3	1.88	0.55
1:A:749:ASN:ND2	1:A:868:THR:O	2.39	0.54
1:A:1963:ARG:NH1	1:A:1965:SER:OG	2.40	0.54
1:A:2038:LEU:O	1:A:2042:ASN:ND2	2.40	0.54
1:A:1614:ASN:O	1:A:1618:LEU:N	2.40	0.54
1:A:2137:VAL:O	1:A:2221:ILE:HA	2.07	0.54
1:A:708:ARG:NE	1:A:710:GLY:O	2.39	0.54
1:A:363:ASN:HD21	1:A:1253:LEU:HD22	1.72	0.54
1:A:887:PRO:HG2	1:A:890:LEU:HD11	1.89	0.54
1:A:2104:ASP:OD1	1:A:2108:ARG:NH1	2.41	0.54
1:A:792:LEU:HA	1:A:795:MET:HE3	1.88	0.54
1:A:1170:VAL:HA	1:A:1173:MET:HG2	1.89	0.54
1:A:1163:VAL:HA	1:A:1321:LEU:HD13	1.88	0.54
1:A:2005:GLN:OE1	1:A:2320:ARG:NH1	2.41	0.53
1:A:663:LEU:HB2	1:A:672:LEU:HB2	1.90	0.53
1:A:1000:GLU:O	1:A:1004:ASN:ND2	2.42	0.53
1:A:471:SER:OG	1:A:472:MET:N	2.36	0.53
1:A:744:PHE:HB3	1:A:864:ILE:HD13	1.90	0.53
1:A:1421:GLU:H	1:A:1431:LEU:HD13	1.73	0.53
1:A:686:ILE:HD12	1:A:712:ASN:HD21	1.74	0.53
1:A:2635:ARG:O	1:A:2635:ARG:NH1	2.42	0.53
1:A:669:SER:HB3	1:A:686:ILE:HB	1.92	0.52
1:A:2008:MET:SD	1:A:2320:ARG:NH1	2.83	0.52
1:A:845:ARG:O	1:A:845:ARG:NH1	2.41	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1387:GLU:OE2	1:A:1391:ARG:NH1	2.42	0.52
1:A:1919:LEU:HD23	1:A:1930:ALA:HB2	1.91	0.52
1:A:468:THR:O	1:A:829:ASN:ND2	2.43	0.52
1:A:2002:VAL:O	1:A:2006:GLN:NE2	2.43	0.52
1:A:2069:PHE:HD1	1:A:2073:ASN:HD22	1.58	0.52
1:A:776:LEU:HA	1:A:779:ILE:HG22	1.90	0.51
1:A:912:ARG:NH1	1:A:918:ASN:O	2.44	0.51
1:A:1414:SER:HB3	1:A:1424:VAL:HG23	1.92	0.51
1:A:2204:ASN:HD21	1:A:2209:GLN:HA	1.76	0.51
1:A:2417:LEU:HD13	1:A:2605:TYR:HB2	1.92	0.51
1:A:891:HIS:CE1	1:A:895:HIS:HB3	2.46	0.51
1:A:2333:PHE:HA	1:A:2336:ILE:HD12	1.93	0.50
1:A:2629:LEU:HD22	1:A:2638:LYS:HG2	1.92	0.50
1:A:1648:HIS:HA	1:A:1651:MET:HE2	1.93	0.50
1:A:2542:GLY:O	1:A:2660:THR:OG1	2.29	0.50
1:A:524:LEU:HD22	1:A:536:MET:HE3	1.94	0.50
1:A:472:MET:HG2	1:A:720:GLN:HG3	1.94	0.50
1:A:580:LEU:O	1:A:584:HIS:ND1	2.44	0.50
1:A:2058:MET:HA	1:A:2061:ILE:HG12	1.94	0.50
1:A:984:SER:OG	1:A:1102:LYS:NZ	2.39	0.50
1:A:2547:SER:HA	1:A:2550:ILE:HD12	1.93	0.49
1:A:833:ILE:HA	1:A:836:VAL:HG22	1.94	0.49
1:A:2632:GLU:HG3	1:A:2634:SER:H	1.77	0.49
1:A:736:LYS:NZ	1:A:885:MET:HB3	2.28	0.49
1:A:749:ASN:ND2	1:A:868:THR:OG1	2.41	0.49
1:A:1831:ASN:HD21	1:A:1886:GLU:HG3	1.78	0.48
1:A:1359:HIS:HB3	1:A:1362:ASP:HB3	1.95	0.48
1:A:2358:LYS:HE2	1:A:2362:ILE:HD12	1.95	0.48
1:A:1941:VAL:O	1:A:1945:ASN:HB2	2.14	0.48
1:A:2070:THR:OG1	1:A:2071:VAL:N	2.47	0.48
1:A:2168:MET:HE2	1:A:2199:MET:HG2	1.96	0.48
1:A:691:MET:HE3	1:A:694:GLN:HE22	1.79	0.48
1:A:1038:PHE:O	1:A:1042:ASN:HB2	2.14	0.48
1:A:1534:SER:OG	1:A:1886:GLU:OE2	2.32	0.48
1:A:1591:ILE:HA	1:A:1594:ILE:HG22	1.96	0.48
1:A:725:VAL:HG11	1:A:890:LEU:HA	1.94	0.48
1:A:944:VAL:HG23	1:A:1253:LEU:HD11	1.95	0.48
1:A:1463:LEU:HD21	1:A:1525:ILE:HG23	1.96	0.47
1:A:2069:PHE:HB3	1:A:2073:ASN:HB2	1.96	0.47
1:A:2189:SER:HB2	1:A:2203:VAL:HG13	1.96	0.47
1:A:1183:HIS:HA	1:A:1186:GLN:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1274:LYS:HD2	1:A:1275:LEU:HG	1.96	0.47
1:A:2147:ASN:HB3	1:A:2151:TYR:HB2	1.95	0.47
1:A:1640:SER:HA	1:A:1643:GLU:HG2	1.95	0.47
1:A:336:SER:HB3	1:A:1270:LEU:HD13	1.96	0.47
1:A:837:ASN:HA	1:A:840:LYS:HB3	1.96	0.47
1:A:1885:ILE:HG12	1:A:1983:LEU:HB2	1.95	0.47
1:A:2185:ARG:H	1:A:2188:ARG:HD2	1.80	0.47
1:A:2263:ILE:HD11	1:A:2279:LEU:HD13	1.97	0.47
1:A:929:MET:HE3	1:A:933:LYS:HE2	1.97	0.47
1:A:1626:ASP:HB2	1:A:1673:LEU:HD11	1.96	0.47
1:A:2184:LEU:O	1:A:2204:ASN:ND2	2.46	0.47
1:A:535:CYS:SG	1:A:536:MET:N	2.88	0.46
1:A:661:LYS:H	1:A:674:ALA:HB3	1.80	0.46
1:A:572:TRP:O	1:A:576:ILE:HG12	2.14	0.46
1:A:1559:ASP:OD1	1:A:1559:ASP:N	2.48	0.46
1:A:1644:MET:O	1:A:1648:HIS:ND1	2.48	0.46
1:A:861:LYS:N	1:A:865:THR:O	2.44	0.46
1:A:2262:GLN:HB3	1:A:2332:LEU:HD11	1.98	0.46
1:A:702:GLU:HB2	1:A:718:ARG:HB3	1.96	0.46
1:A:942:LEU:HD23	1:A:1400:PHE:HZ	1.81	0.46
1:A:1412:SER:OG	1:A:1413:SER:N	2.48	0.46
1:A:2040:LEU:HG	1:A:2051:TRP:HB2	1.97	0.46
1:A:723:ASN:HB2	1:A:726:ARG:HE	1.81	0.46
1:A:1692:ARG:HH11	1:A:1696:THR:HA	1.81	0.45
1:A:2082:LEU:HD13	1:A:2110:ILE:HD12	1.97	0.45
1:A:1198:ASP:OD1	1:A:1198:ASP:N	2.50	0.45
1:A:775:ILE:HA	1:A:778:ASN:HD22	1.80	0.45
1:A:1204:LEU:HA	1:A:1207:LEU:HG	1.98	0.45
1:A:1487:TYR:HE1	1:A:1682:ALA:HA	1.82	0.45
1:A:1228:LEU:HD12	1:A:1368:ILE:HG12	1.98	0.45
1:A:1068:VAL:HB	1:A:1071:LYS:HE2	1.98	0.45
1:A:702:GLU:N	1:A:702:GLU:OE1	2.50	0.45
1:A:1820:LYS:HA	1:A:1823:VAL:HG12	1.99	0.45
1:A:2471:GLU:OE1	1:A:2559:ARG:NH2	2.50	0.45
1:A:1595:ASN:O	1:A:1599:LYS:NZ	2.44	0.45
1:A:2454:LEU:HB2	1:A:2516:ILE:HB	1.99	0.45
1:A:915:LEU:HD21	1:A:936:PHE:HB2	1.98	0.44
1:A:1196:SER:OG	1:A:1199:ASN:OD1	2.34	0.44
1:A:576:ILE:HG23	1:A:698:CYS:HA	1.99	0.44
1:A:2675:MET:HE3	1:A:2679:GLU:HG3	1.99	0.44
1:A:633:ALA:HB1	1:A:636:HIS:HB2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1158:ASP:OD1	1:A:1158:ASP:N	2.50	0.44
1:A:1890:LEU:HD12	1:A:1891:LYS:HD2	1.99	0.44
1:A:2452:LYS:HG2	1:A:2526:PRO:HG3	1.99	0.44
1:A:341:ARG:HG3	1:A:926:LYS:HB2	2.00	0.44
1:A:1141:GLN:HA	1:A:1144:GLU:HG3	1.99	0.44
1:A:1644:MET:HA	1:A:1647:VAL:HG22	2.00	0.44
1:A:1669:LEU:O	1:A:1673:LEU:HB2	2.17	0.44
1:A:728:LEU:HD21	1:A:1683:LEU:HD21	2.00	0.44
1:A:897:LEU:O	1:A:901:LEU:HD12	2.18	0.44
1:A:1824:ASN:HA	1:A:1827:ILE:HG12	2.00	0.44
1:A:2455:VAL:HG12	1:A:2457:PRO:HD3	2.00	0.44
1:A:1026:ARG:HD2	1:A:1026:ARG:HA	1.86	0.44
1:A:1601:THR:HG22	1:A:1602:MET:H	1.81	0.44
1:A:1239:SER:OG	1:A:1320:TRP:O	2.35	0.44
1:A:2058:MET:HE1	1:A:2097:LEU:HB3	1.99	0.44
1:A:1577:LYS:NZ	1:A:1582:THR:O	2.38	0.44
1:A:2002:VAL:HG12	1:A:2006:GLN:HE22	1.83	0.44
1:A:2240:LYS:HD2	1:A:2240:LYS:HA	1.80	0.44
1:A:408:LYS:HA	1:A:411:ILE:HG22	1.99	0.43
1:A:2204:ASN:OD1	1:A:2206:THR:OG1	2.31	0.43
1:A:468:THR:O	1:A:791:LYS:NZ	2.51	0.43
1:A:892:ASN:OD1	1:A:893:HIS:N	2.52	0.43
1:A:732:LYS:O	1:A:735:SER:OG	2.30	0.43
1:A:2001:VAL:O	1:A:2005:GLN:HG2	2.18	0.43
1:A:2186:THR:HG22	1:A:2187:ARG:HG3	2.00	0.43
1:A:761:GLU:HG2	1:A:762:LYS:HD3	2.00	0.43
1:A:2152:LEU:HD13	1:A:2205:ALA:HB3	1.99	0.43
1:A:2199:MET:SD	1:A:2199:MET:N	2.91	0.43
1:A:2269:ASP:HA	1:A:2272:ARG:HH21	1.84	0.43
1:A:822:LYS:HA	1:A:822:LYS:HD2	1.88	0.42
1:A:702:GLU:O	1:A:718:ARG:N	2.48	0.42
1:A:1561:VAL:HG22	1:A:1567:LEU:HD11	2.00	0.42
1:A:1848:ARG:NH1	1:A:1874:VAL:O	2.51	0.42
1:A:1883:ASN:HB2	1:A:1885:ILE:HG13	2.00	0.42
1:A:864:ILE:O	1:A:866:GLY:N	2.52	0.42
1:A:747:LYS:HA	1:A:747:LYS:HD3	1.86	0.42
1:A:469:ASN:OD1	1:A:470:PHE:N	2.52	0.42
1:A:598:TYR:O	1:A:602:ALA:HB3	2.18	0.42
1:A:580:LEU:HG	1:A:584:HIS:CE1	2.55	0.42
1:A:638:SER:HB3	1:A:734:PRO:HG3	2.00	0.42
1:A:861:LYS:NZ	1:A:869:LEU:HG	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:909:LEU:HD12	1:A:1301:ALA:HB1	2.01	0.42
1:A:434:GLU:OE2	1:A:1391:ARG:NH2	2.53	0.42
1:A:1685:ARG:HA	1:A:1688:ARG:HB2	2.01	0.42
1:A:2082:LEU:HA	1:A:2085:ILE:HG12	2.01	0.42
1:A:2382:LYS:HD2	1:A:2432:ILE:HD11	2.01	0.42
1:A:2399:ILE:HD13	1:A:2399:ILE:HA	1.90	0.42
1:A:1216:ASN:HB2	1:A:1228:LEU:HD13	2.01	0.41
1:A:1530:ILE:HG23	1:A:1531:LEU:HG	2.02	0.41
1:A:2048:LYS:HA	1:A:2048:LYS:HD2	1.81	0.41
1:A:2456:LEU:HB3	1:A:2459:ILE:HD12	2.02	0.41
1:A:2678:ARG:HD2	1:A:2678:ARG:HA	1.87	0.41
1:A:663:LEU:HD22	1:A:672:LEU:HD22	2.02	0.41
1:A:1491:PRO:HG3	1:A:1520:TRP:HZ2	1.84	0.41
1:A:1909:THR:HA	1:A:1912:ILE:HG22	2.02	0.41
1:A:2596:ASN:OD1	1:A:2597:GLU:N	2.54	0.41
1:A:338:ASP:HA	1:A:341:ARG:HE	1.86	0.41
1:A:1013:TRP:HH2	1:A:1056:ILE:HD12	1.85	0.41
1:A:1830:VAL:O	1:A:1833:SER:OG	2.32	0.41
1:A:420:LEU:HD13	1:A:1343:THR:HG22	2.02	0.41
1:A:490:ARG:HH11	1:A:521:LEU:HG	1.86	0.41
1:A:1089:LEU:HB2	1:A:1095:VAL:HG11	2.03	0.41
1:A:1127:ASN:OD1	1:A:1127:ASN:N	2.54	0.41
1:A:1706:LEU:HD23	1:A:1706:LEU:HA	1.95	0.41
1:A:2441:GLN:NE2	1:A:2557:SER:O	2.54	0.41
1:A:982:LYS:O	1:A:1104:SER:OG	2.40	0.41
1:A:1686:VAL:HG23	1:A:1687:LEU:HD12	2.03	0.41
1:A:1131:GLY:O	1:A:1664:ASN:ND2	2.53	0.40
1:A:1334:SER:HG	1:A:1356:TRP:NE1	2.19	0.40
1:A:1832:PHE:HA	1:A:1835:LEU:HB3	2.03	0.40
1:A:2445:MET:SD	1:A:2528:ASN:ND2	2.95	0.40
1:A:519:LEU:HD22	1:A:546:ILE:HG13	2.02	0.40
1:A:708:ARG:HB2	1:A:713:TYR:HE1	1.87	0.40
1:A:1822:CYS:HA	1:A:1825:LEU:HG	2.03	0.40
1:A:2524:LEU:HD23	1:A:2524:LEU:HA	1.96	0.40
1:A:891:HIS:ND1	1:A:895:HIS:HB3	2.37	0.40
1:A:1605:GLN:HE21	1:A:1608:LYS:HG2	1.86	0.40
1:A:2137:VAL:HG23	1:A:2219:VAL:HG11	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	2220/2441 (91%)	2030 (91%)	185 (8%)	5 (0%)	44 76

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2487	ASP
1	A	865	THR
1	A	986	LYS
1	A	1606	ILE
1	A	852	ILE

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	2067/2265 (91%)	2066 (100%)	1 (0%)	100 100

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1901	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	410	GLN
1	A	447	ASN
1	A	508	ASN
1	A	829	ASN
1	A	877	ASN
1	A	1003	GLN
1	A	1004	ASN
1	A	1235	GLN
1	A	1319	ASN
1	A	1495	ASN
1	A	1550	ASN
1	A	1605	GLN
1	A	1672	GLN
1	A	1852	ASN
1	A	1854	ASN
1	A	1901	ASN
1	A	1938	GLN
1	A	2006	GLN
1	A	2100	HIS
1	A	2292	ASN
1	A	2317	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 (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

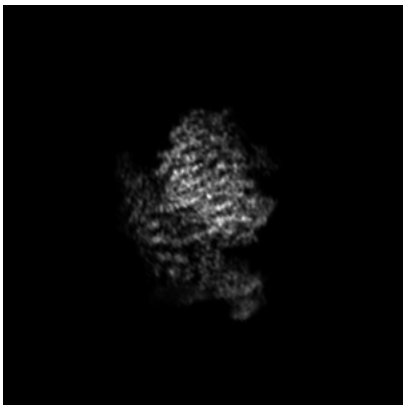
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-37255. These allow visual inspection of the internal detail of the map and identification of artifacts.

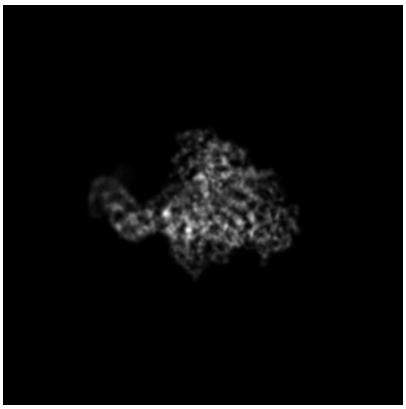
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

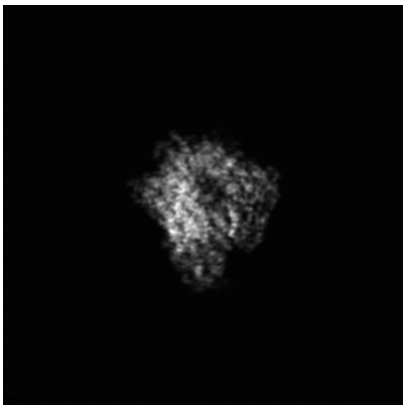
6.1.1 Primary map



X

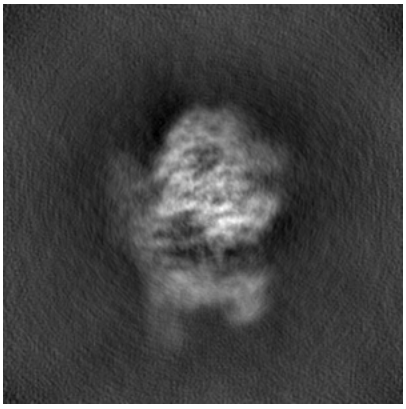


Y

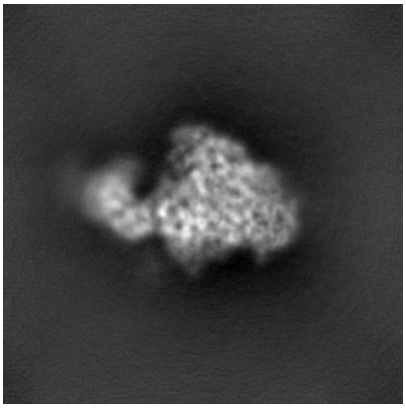


Z

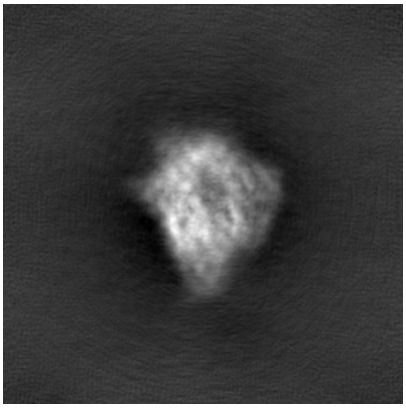
6.1.2 Raw map



X



Y



Z

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

6.2 Central slices (i)

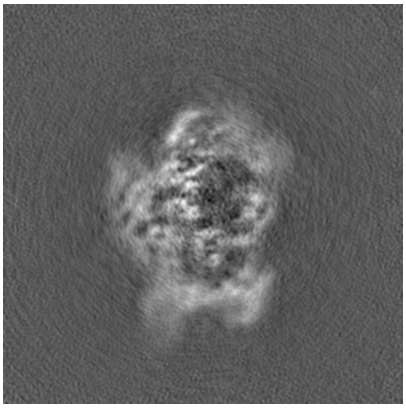
6.2.1 Primary map

X Index: 128

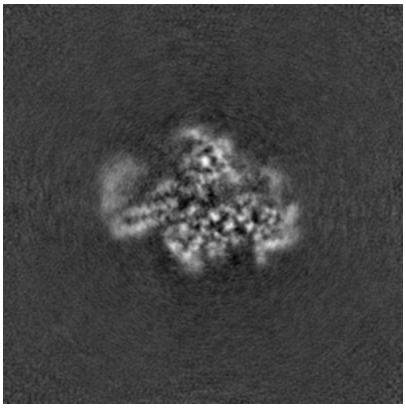
Y Index: 128

Z Index: 128

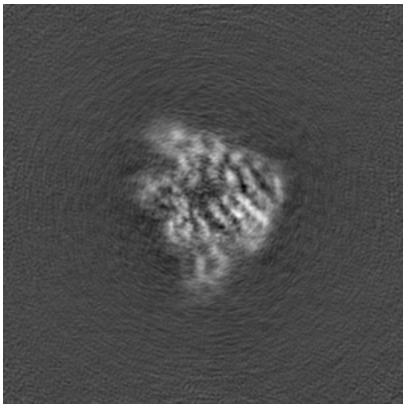
6.2.2 Raw map



X Index: 128



Y Index: 128

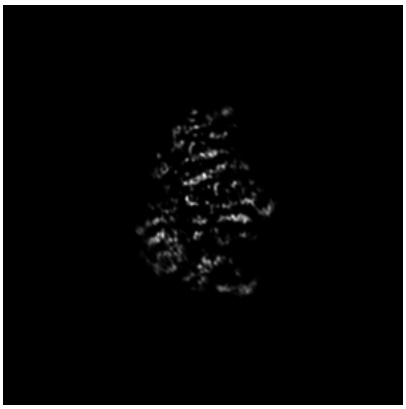


Z Index: 128

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

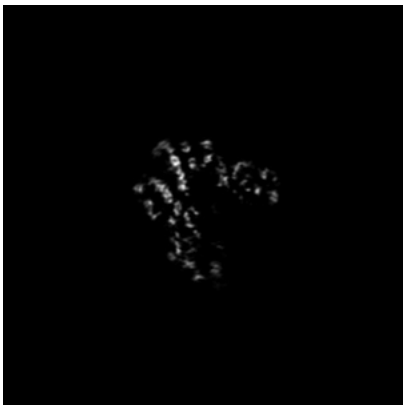
6.3 Largest variance slices (i)

6.3.1 Primary map



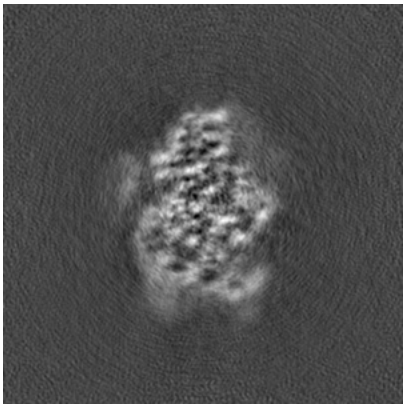
X Index: 112

Y Index: 118

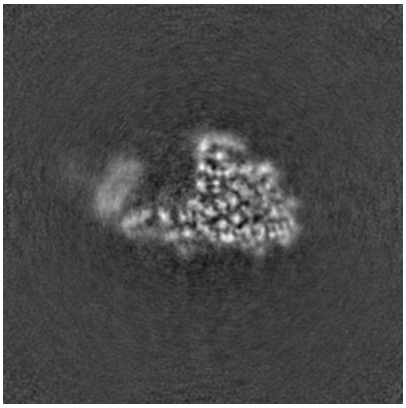


Z Index: 118

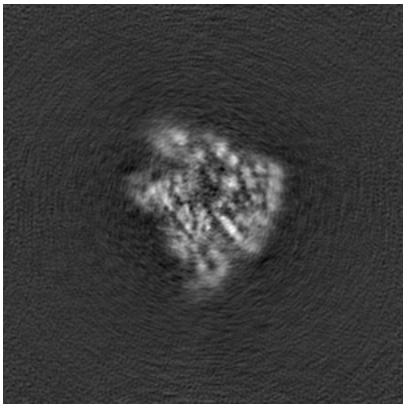
6.3.2 Raw map



X Index: 117



Y Index: 119

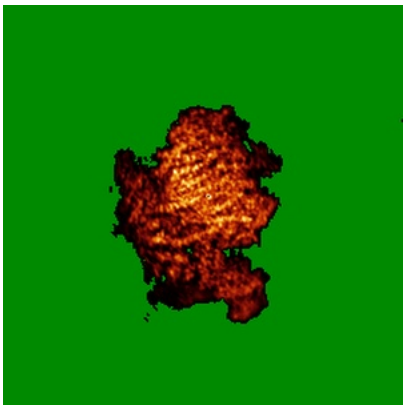


Z Index: 125

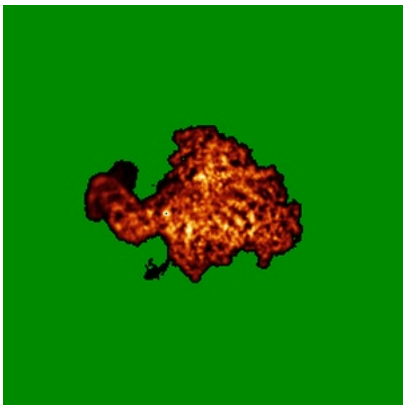
The images above show the largest variance slices of the map in three orthogonal directions.

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

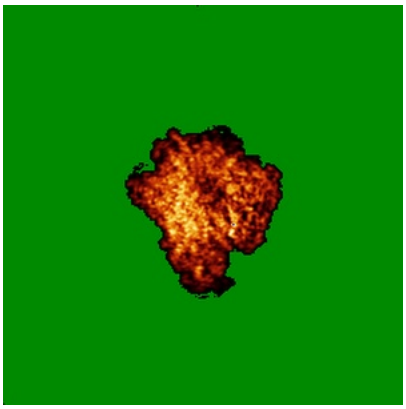
6.4.1 Primary map



X

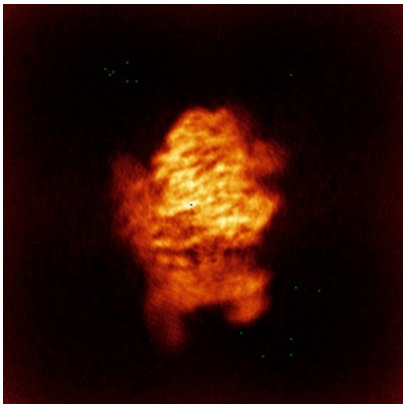


Y

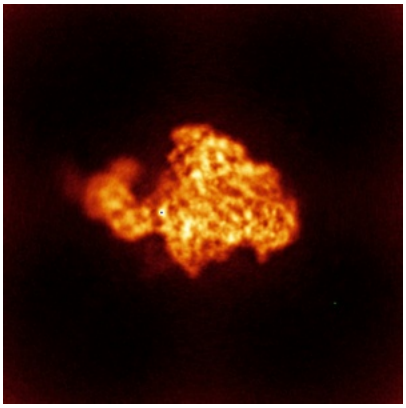


Z

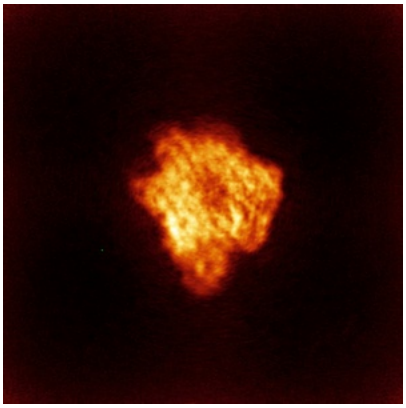
6.4.2 Raw map



X



Y

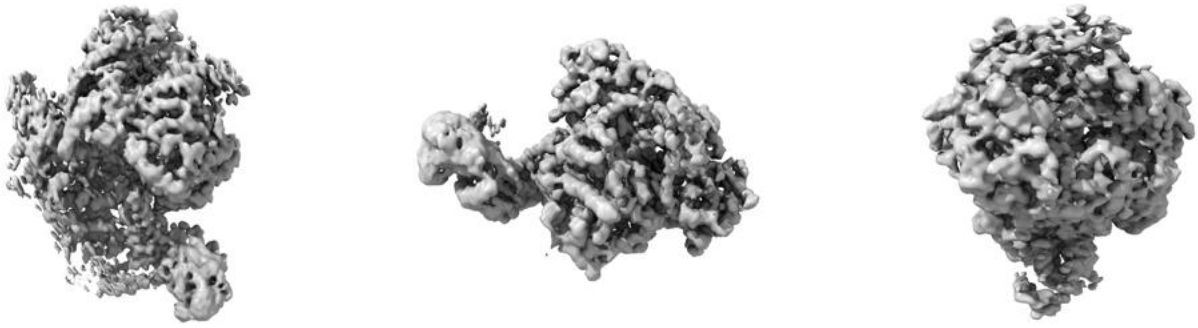


Z

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)

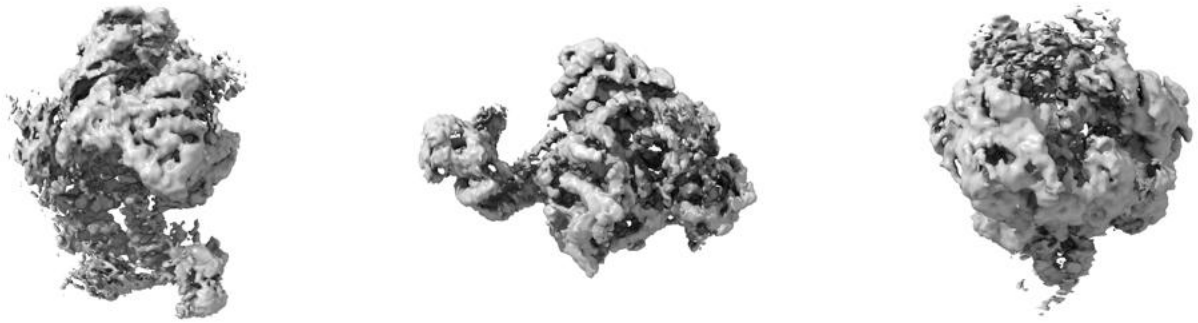
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.087. 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.

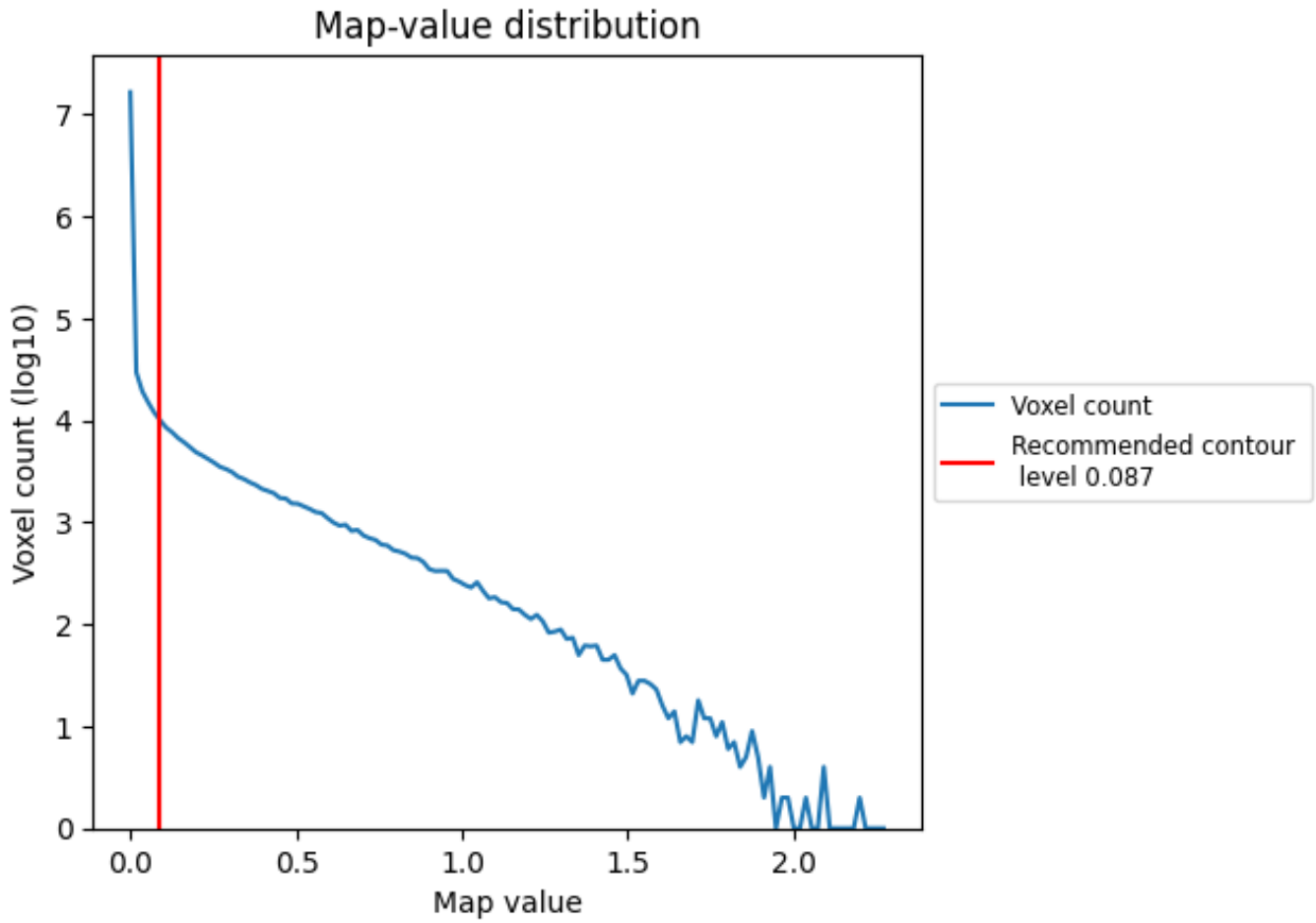
6.6 Mask visualisation (i)

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

7 Map analysis

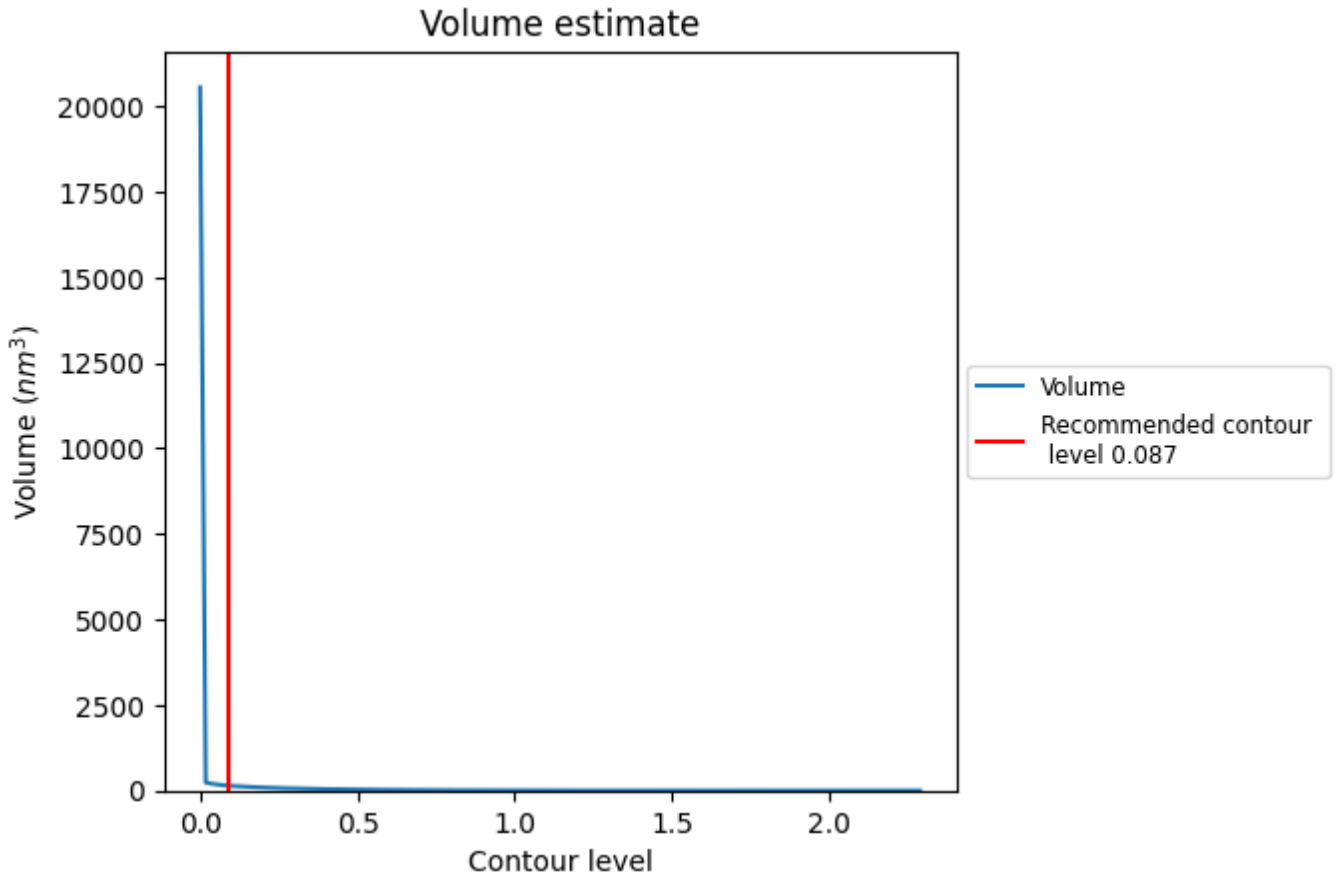
This section contains the results of statistical analysis of the map.

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.

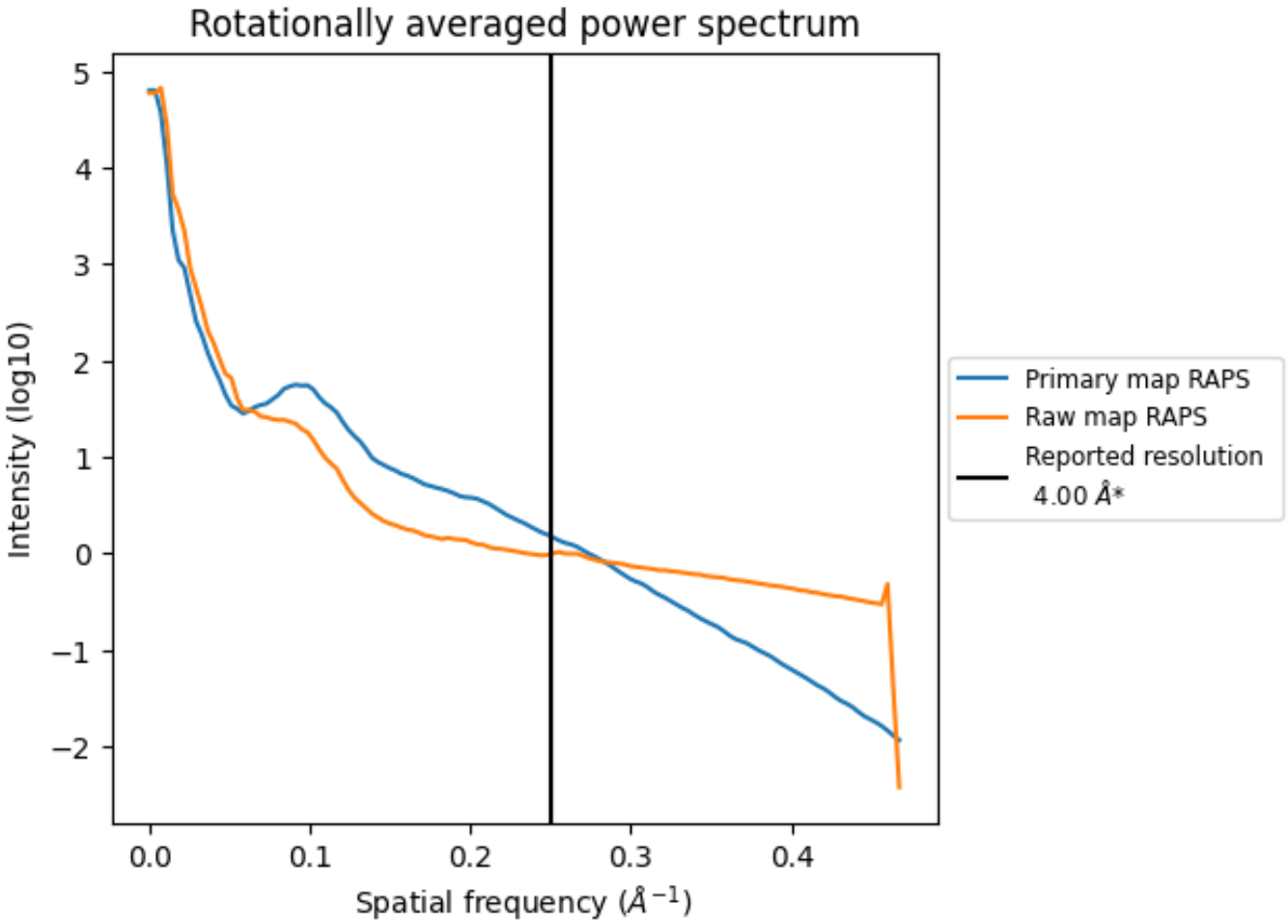
7.2 Volume estimate



The volume at the recommended contour level is 145 nm^3; this corresponds to an approximate mass of 131 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)

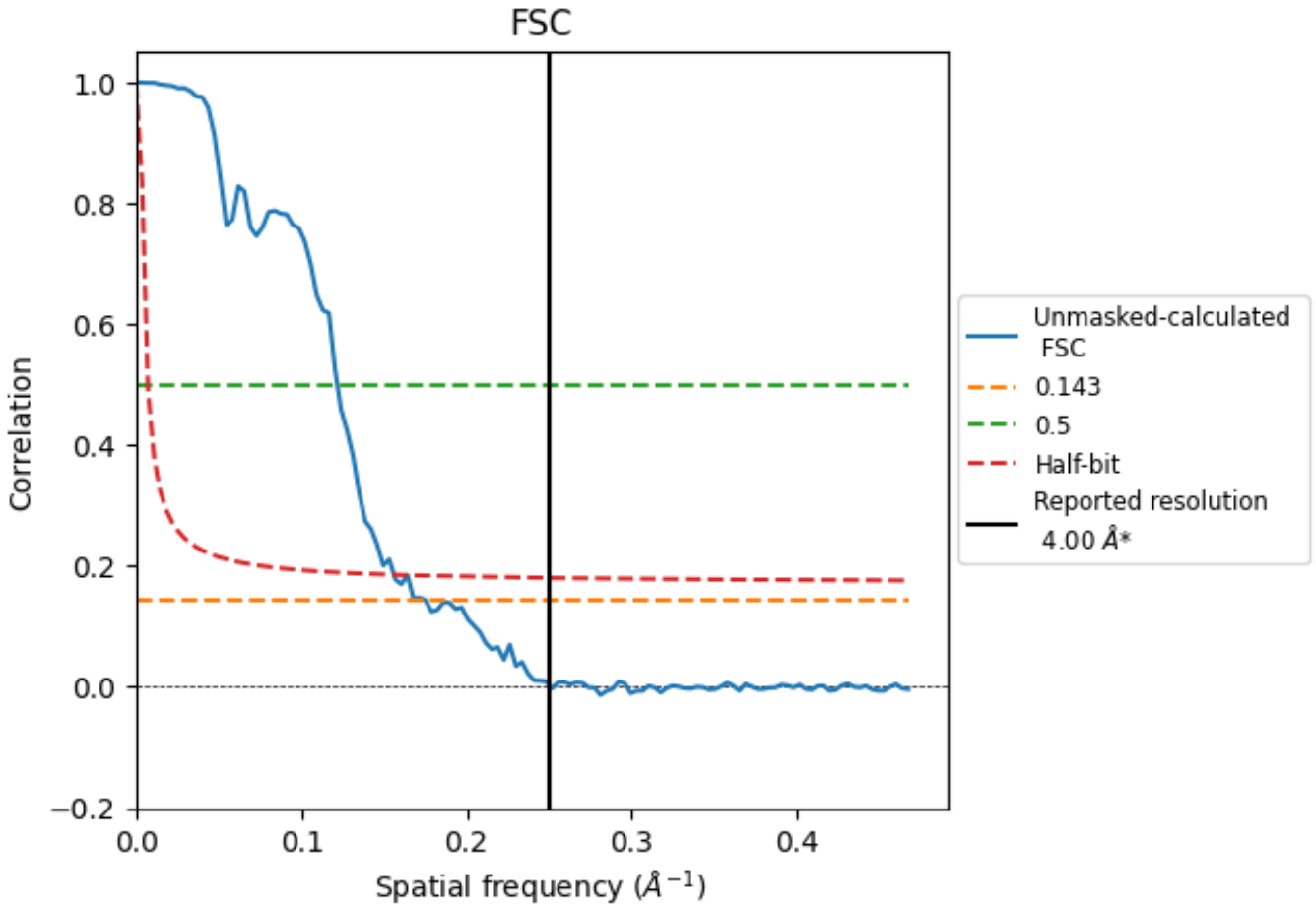


*Reported resolution corresponds to spatial frequency of 0.250 Å^{-1}

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 0.250 Å^{-1}

8.2 Resolution estimates (i)

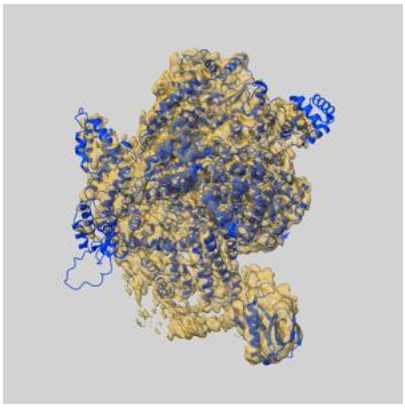
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.70	8.21	6.41

*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 5.70 differs from the reported value 4.0 by more than 10 %

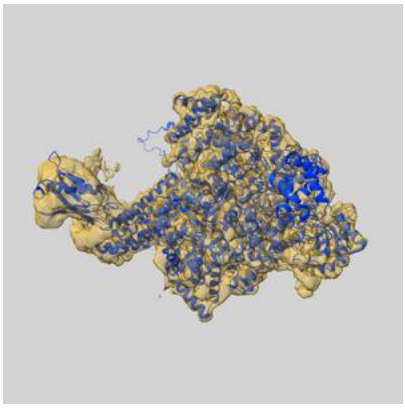
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-37255 and PDB model 8KI9. Per-residue inclusion information can be found in section 3 on page 4.

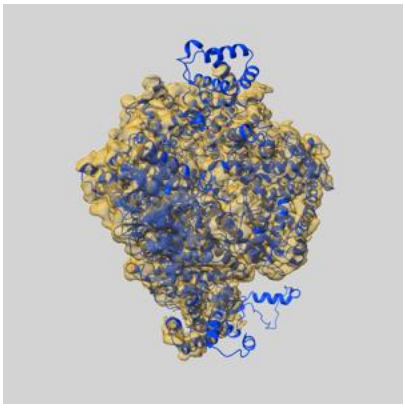
9.1 Map-model overlay



X



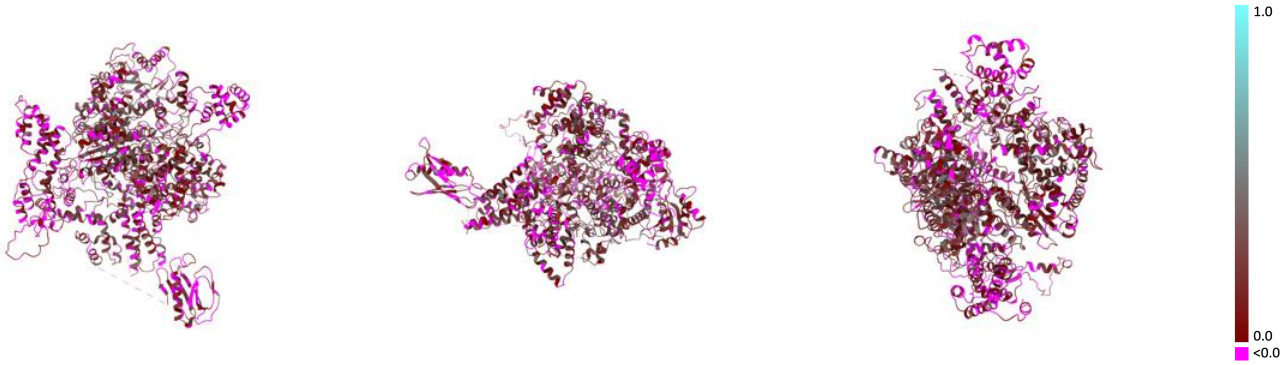
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.087 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.

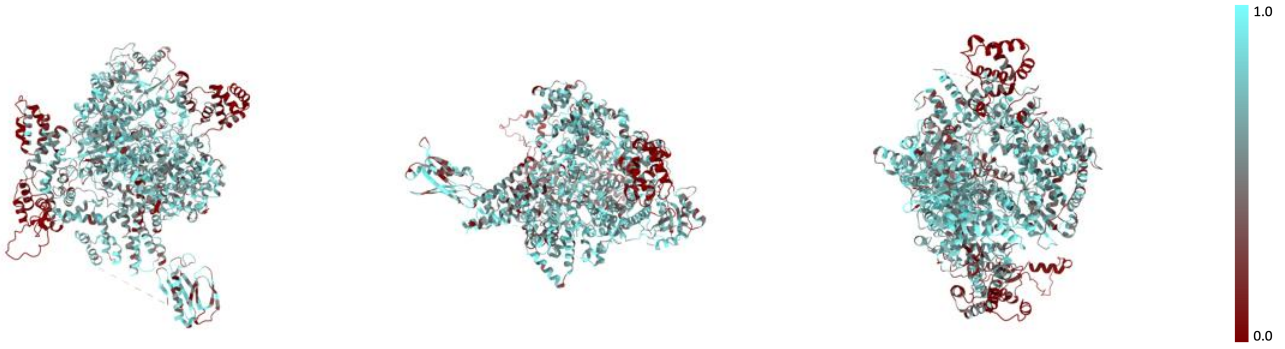
9.2 Q-score mapped to coordinate model (i)



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.

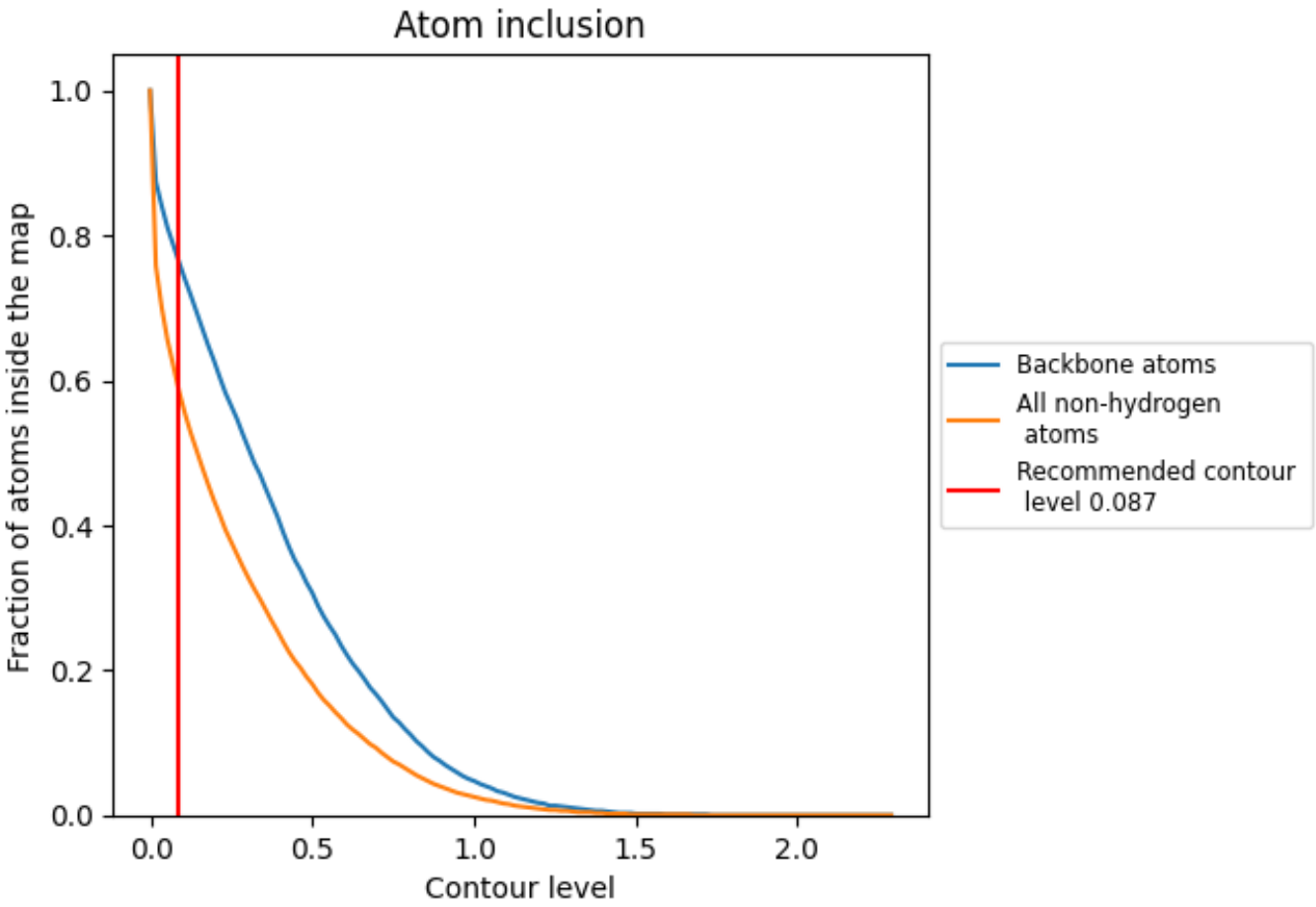
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.087).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 59% 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 (0.087) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5870	0.1350
A	0.5870	0.1350