WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Mar 20, 2024 – 12:05 AM JST

PDB ID	:	6K9L
EMDB ID	:	EMD-9950
Title	:	4.27 Angstrom resolution cryo-EM structure of human dimeric ATM kinase
Authors	:	Xiao, J.; Liu, M.; Qi, Y.; Chaban, Y.; Gao, C.; Tian, Y.; Yu, Z.; Li, J.; Zhang, P.; Xu, Y.
Deposited on	:	2019-06-16
Resolution	:	4.27 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 (i) 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 (i)) were used in the production of this report:

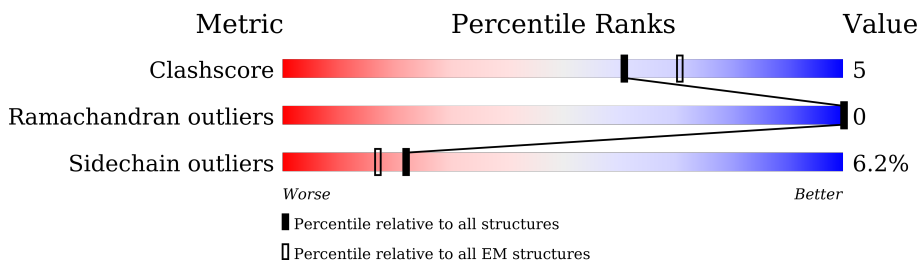|		
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1　Overall quality at a glance ⓘ

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

The reported resolution of this entry is 4.27 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	Percentile Ranks	Value
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		6.2%

Worse *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	19% / 76% 7% · 16%
1	B	3056	18% / 76% 7% · 17%

2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 30601 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.
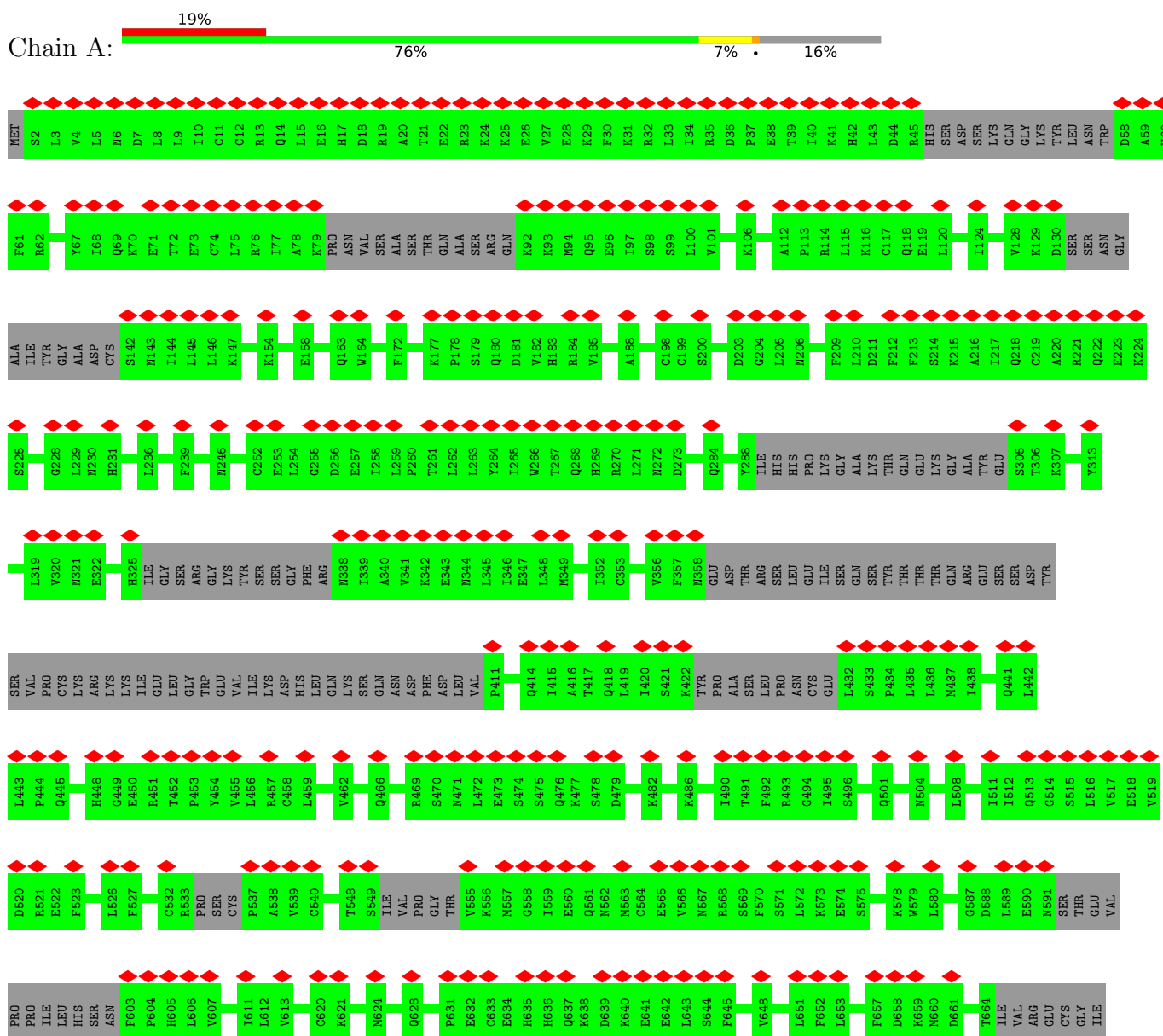
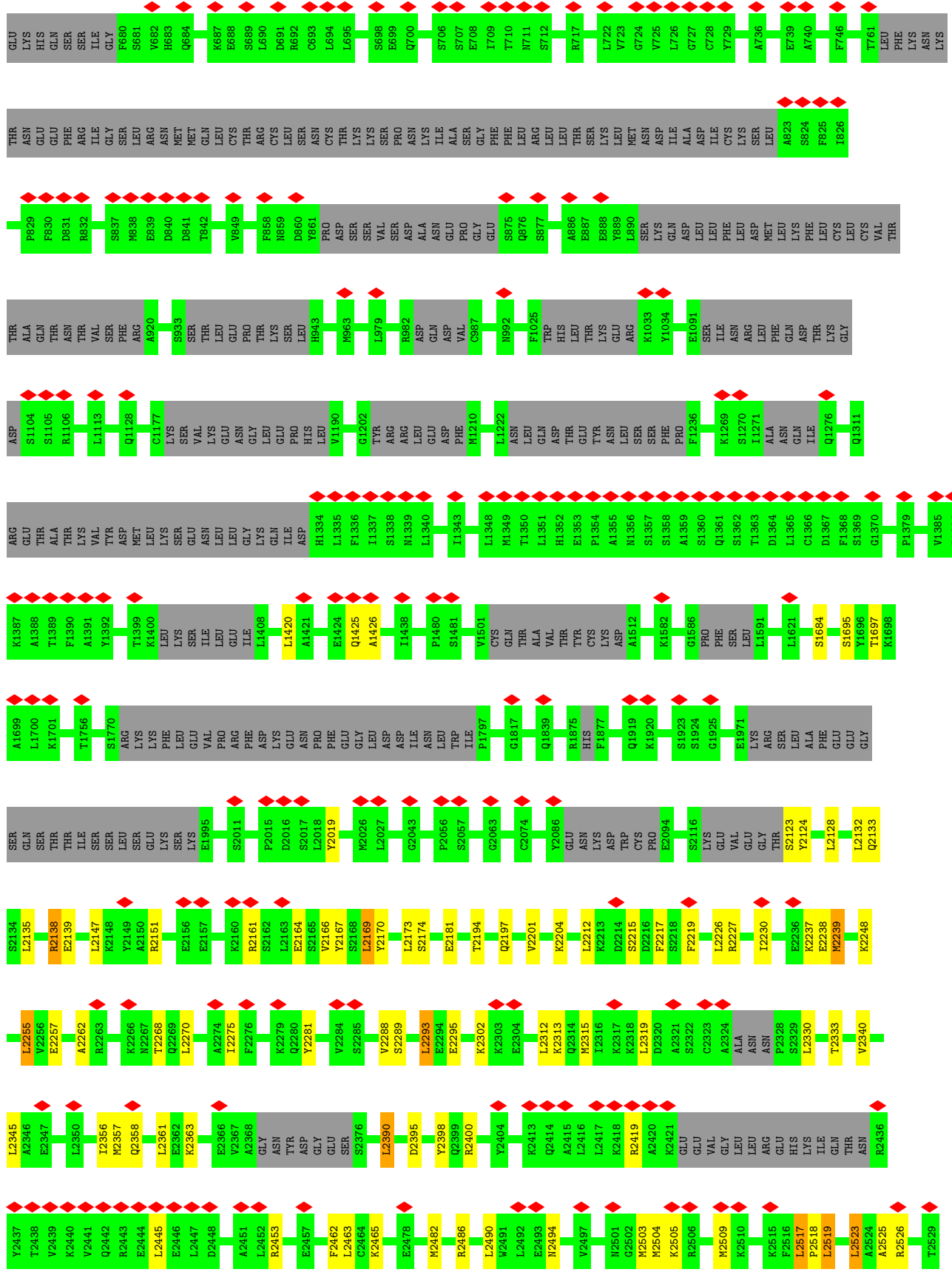- Molecule 1 is a protein called Serine-protein kinase ATM.

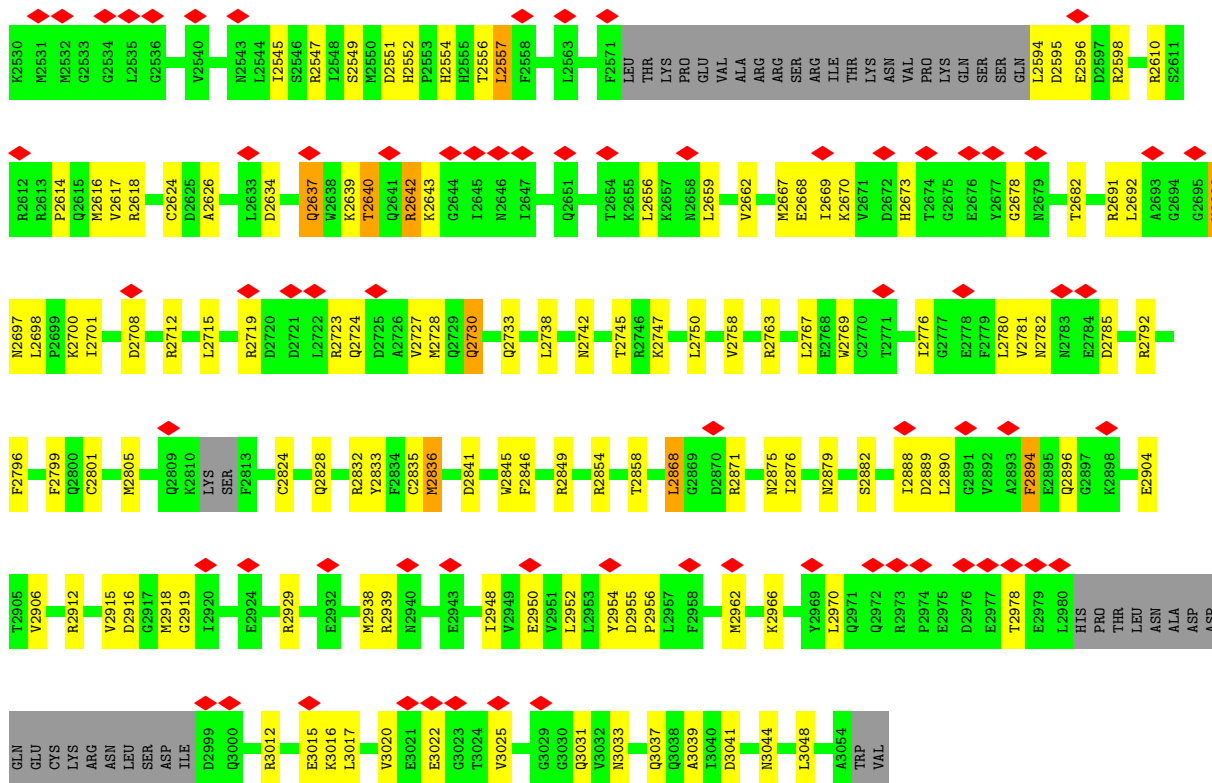| Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2552	Total	C	N	O	S	0	0
			15303	9384	2901	2969	49		
1	B	2551	Total	C	N	O	S	0	0
			15298	9381	2900	2968	49		

3 Residue-property plots ⓘ

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.
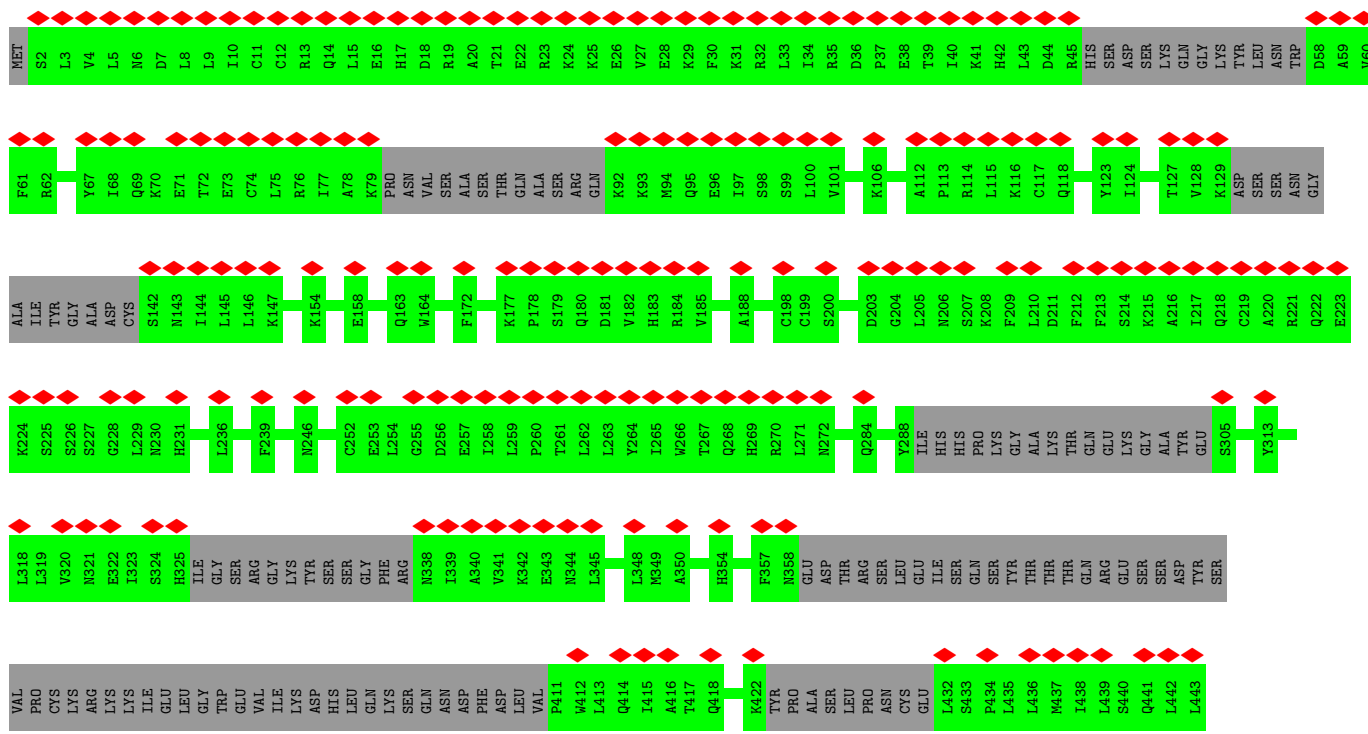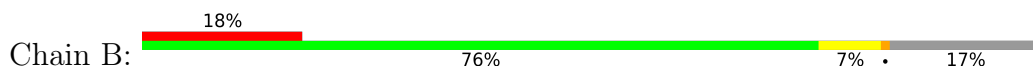
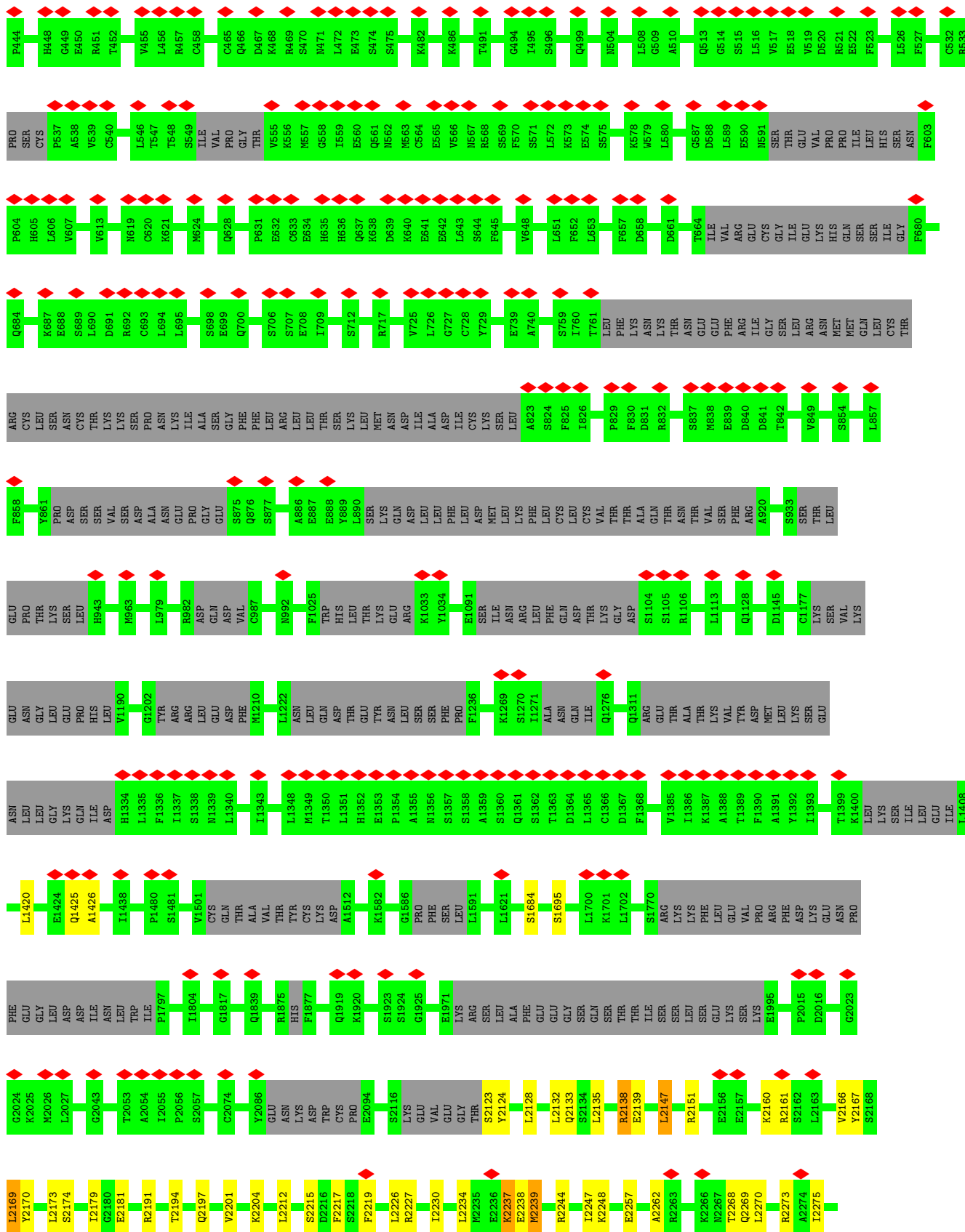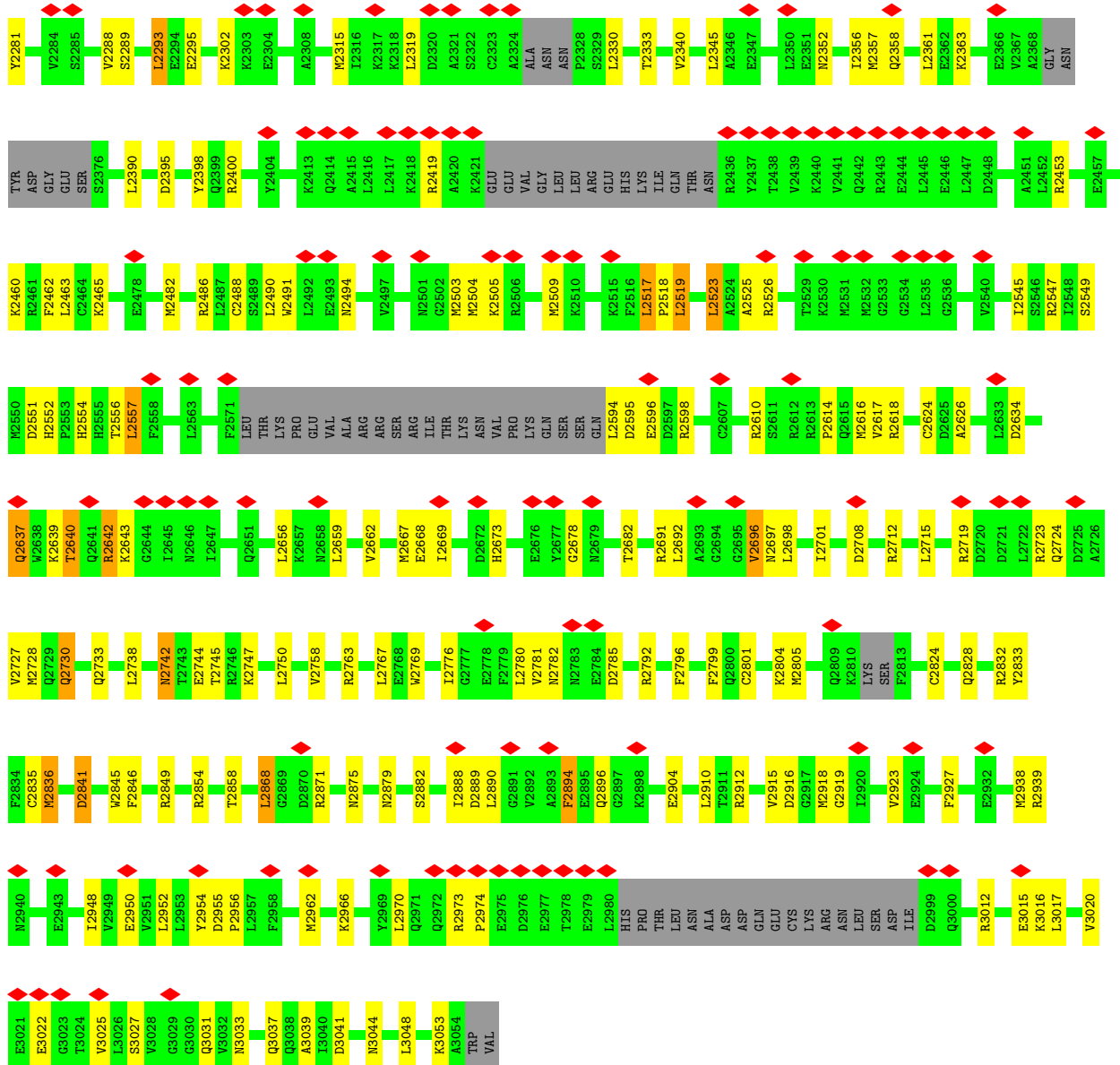• Molecule 1: Serine-protein kinase ATM

K2530 M2531 M2532 G2533 G2534 L2535 G2536 V2540 N2543 L2544 I2645 S2546 R2547 I2648 S2549 M2550 D2551 H2552 P2553 H2554 H2555 T2556 L2557 F2558 L2563 F2571 LEU THR LYS PRO GLU VAL ALA ARG ARG SER ARG ILE THR LYS ASN VAL PRO LYS GLN SER SER GLN L2594 D2595 E2596 D2597 R2598 R2610 S2611

R2612 R2613 P2614 Q2615 M2616 V2617 R2618 C2624 D2625 A2626 L2633 D2634 Q2637 W2638 K2639 T2640 Q2641 R2642 K2643 G2644 I2645 N2646 I2647 Q2651 T2654 K2655 L2656 K2657 N2658 L2659 V2662 M2667 E2668 I2669 K2670 V2671 D2672 H2673 T2674 G2675 E2676 Y2677 G2678 N2679 T2682 R2691 L2692 A2693 G2694 G2695 V2696

N2697 L2698 P2699 K2700 I2701 D2708 R2712 L2715 R2719 D2720 D2721 L2722 R2723 Q2724 D2725 A2726 V2727 M2728 Q2729 Q2730 Q2733 L2738 N2742 T2745 R2746 K2747 L2750 V2758 R2763 L2767 E2768 W2769 C2770 T2771 I2776 G2777 E2778 F2779 L2780 V2781 N2782 T2783 E2784 D2785 R2792

F2796 F2799 Q2800 C2801 M2805 Q2809 K2810 LYS SER F2813 C2824 Q2828 R2832 Y2833 F2834 C2835 M2836 D2841 W2845 F2846 R2849 R2854 T2858 L2868 Q2869 D2870 R2871 N2875 I2876 N2879 S2882 I2888 D2889 L2890 G2891 V2892 A2893 F2894 E2895 Q2896 G2897 K2898 E2904

T2905 V2906 R2912 V2915 D2916 G2917 M2918 G2919 I2920 E2924 R2929 E2932 M2938 R2939 N2940 E2943 I2948 V2949 V2951 L2952 L2953 Y2954 D2955 P2956 L2957 F2958 M2962 K2966 Y2969 L2970 Q2971 Q2972 R2973 P2974 E2975 D2976 E2977 T2978 E2979 L2980 HIS PRO THR LEU ASN ALA ASP ASP

GLN GLU CYS LYS ARG ASN SER ASP ILE D2999 Q3000 R3012 E3015 K3016 L3017 V3020 E3021 E3022 G3023 T3024 V3025 G3029 G3030 Q3031 V3032 N3033 Q3037 Q3038 A3039 I3040 D3041 N3044 L3048 A3054 TRP VAL

• Molecule 1: Serine-protein kinase ATM

Chain B:

18%

76%　　　7%　•　17%

MET S2 L3 V4 L5 N6 D7 L8 L9 I10 C11 C12 R13 Q14 L15 E16 H17 D18 R19 A20 T21 E22 R23 K24 K25 E26 V27 E28 K29 F30 K31 R32 L33 I34 R35 D36 P37 E38 T39 I40 K41 H42 L43 D44 R45 HIS SER ASP SER LYS GLN GLY LYS TYR LEU ASN TRP D58 A59 V60

F61 R62 Y67 I68 Q69 K70 E71 T72 E73 C74 L75 R76 I77 A78 K79 PRO ASN VAL SER ALA SER THR GLN ALA SER ARG GLN K92 K93 M94 Q95 E96 I97 S98 S99 L100 V101 K106 A112 P113 R114 L115 K116 C117 Q118 Y123 I124 T127 V128 K129 ASP SER SER ASN GLY

ALA ILE TYR GLY ALA ASP CYS S142 N143 I144 L145 L146 K147 K154 E158 Q163 W164 F172 K177 P178 S179 Q180 D181 V182 H183 R184 V185 A188 C198 C199 S200 D203 G204 L205 N206 S207 K208 F209 L210 D211 F212 F213 S214 K215 A216 I217 Q218 C219 A220 R221 Q222 E223

K224 S225 S226 S227 G228 L229 N230 H231 L236 F239 N246 C252 E253 L254 G255 D256 E257 I258 L259 P260 T261 L262 L263 Y264 I265 W266 T267 Q268 H269 R270 L271 N272 Q284 Y288 ILE HIS HIS PRO LYS GLY ALA LYS THR GLN GLU LYS GLY ALA TYR GLU S305 Y313

L318 L319 V320 N321 E322 I323 S324 H325 ILE GLY SER ARG GLY LYS TYR SER HIS LEU GLN LYS SER GLN ASN ASP PHE ARG N338 I339 A340 V341 K342 E343 N344 L345 L348 M349 A350 H354 F357 N358 GLU ASP THR ARG SER LEU GLU ILE GLN SER GLN SER TYR THR THR GLN ARG GLU SER SER ASP TYR SER

VAL PRO CYS LYS ARG LYS LYS ILE GLU LEU GLY TRP GLU VAL ILE LYS ASP HIS GLN LEU SER GLN GLN ASN ASP PHE ASP LEU VAL P411 W412 L413 Q414 I415 A416 T417 Q418 K422 TYR PRO ALA SER LEU PRO ASN CYS GLU L432 S433 P434 L435 L436 M437 I438 L439 S440 Q441 L442 L443

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	232416	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 $(e^-/\text{Å}^2)$	32, 38	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k), GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.074	Depositor
Minimum map value	-0.036	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.019	Depositor
Map size (Å)	414.72, 414.72, 414.72	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.62, 1.62, 1.62	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	0/15382	0.40	0/21078
1	B	0.23	0/15377	0.40	0/21071
All	All	0.23	0/30759	0.40	0/42149

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	15303	0	10592	119	0
1	B	15298	0	10590	123	0
All	All	30601	0	21182	240	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 5.

All (240) 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:2868:LEU:H	1:A:2894:PHE:HA	1.54	0.73
1:B:2868:LEU:H	1:B:2894:PHE:HA	1.55	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2824:CYS:SG	1:A:2912:ARG:NH2	2.65	0.70
1:B:2824:CYS:SG	1:B:2912:ARG:NH2	2.65	0.69
1:A:2782:ASN:ND2	1:A:2785:ASP:OD1	2.29	0.66
1:B:2782:ASN:ND2	1:B:2785:ASP:OD1	2.30	0.65
1:B:2835:CYS:SG	1:B:2845:TRP:NE1	2.69	0.65
1:A:2896:GLN:HE22	1:A:2962:MET:HB2	1.61	0.65
1:A:2509:MET:HA	1:A:2547:ARG:HH22	1.61	0.64
1:A:2835:CYS:SG	1:A:2845:TRP:NE1	2.70	0.64
1:B:2723:ARG:NH2	1:B:2955:ASP:OD2	2.31	0.64
1:B:2509:MET:HA	1:B:2547:ARG:HH22	1.63	0.63
1:A:2723:ARG:NH2	1:A:2955:ASP:OD2	2.31	0.63
1:B:2767:LEU:HD13	1:B:2888:ILE:HD11	1.81	0.63
1:B:2792:ARG:HH12	1:B:2828:GLN:H	1.47	0.63
1:B:2896:GLN:HE22	1:B:2962:MET:HB2	1.63	0.63
1:A:2730:GLN:OE1	1:A:2733:GLN:NE2	2.33	0.62
1:A:2719:ARG:HA	1:A:2763:ARG:HB3	1.81	0.62
1:B:2517:LEU:HG	1:B:2518:PRO:HD3	1.80	0.62
1:B:3033:ASN:O	1:B:3037:GLN:NE2	2.33	0.62
1:B:2719:ARG:HA	1:B:2763:ARG:HB3	1.81	0.61
1:B:2730:GLN:OE1	1:B:2733:GLN:NE2	2.32	0.61
1:A:2293:LEU:HD21	1:A:2340:VAL:HG21	1.82	0.61
1:A:2526:ARG:NH2	1:A:2954:TYR:O	2.34	0.61
1:A:2767:LEU:HD13	1:A:2888:ILE:HD11	1.81	0.61
1:A:2181:GLU:OE2	1:A:2227:ARG:NH1	2.33	0.61
1:B:2526:ARG:NH2	1:B:2954:TYR:O	2.34	0.61
1:B:2181:GLU:OE2	1:B:2227:ARG:NH1	2.33	0.61
1:A:2517:LEU:HG	1:A:2518:PRO:HD3	1.82	0.60
1:A:3020:VAL:HG13	1:A:3022:GLU:H	1.67	0.59
1:A:2138:ARG:HG2	1:A:2139:GLU:HG3	1.83	0.59
1:B:2138:ARG:HG2	1:B:2139:GLU:HG3	1.84	0.58
1:A:2217:PHE:HZ	1:A:2262:ALA:HA	1.69	0.58
1:A:2194:THR:HB	1:A:2197:GLN:HG2	1.85	0.58
1:A:2849:ARG:NH1	1:A:2918:MET:O	2.37	0.58
1:A:2792:ARG:HH12	1:A:2828:GLN:H	1.50	0.57
1:A:2289:SER:HB3	1:A:2319:LEU:HD21	1.86	0.57
1:B:2194:THR:HB	1:B:2197:GLN:HG2	1.85	0.57
1:A:2637:GLN:NE2	1:A:2637:GLN:O	2.37	0.57
1:B:2201:VAL:HA	1:B:2204:LYS:HG2	1.87	0.56
1:B:2637:GLN:O	1:B:2637:GLN:NE2	2.37	0.56
1:B:2715:LEU:HD23	1:B:2769:TRP:HB2	1.87	0.56
1:B:2879:ASN:ND2	1:B:2882:SER:OG	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2174:SER:HB3	1:A:2219:PHE:HB2	1.86	0.56
1:A:2400:ARG:NE	1:B:3022:GLU:OE2	2.38	0.56
1:B:2133:GLN:O	1:B:2138:ARG:NH1	2.27	0.56
1:B:3020:VAL:HG13	1:B:3022:GLU:H	1.70	0.56
1:A:2133:GLN:O	1:A:2138:ARG:NH1	2.27	0.56
1:A:2948:ILE:HG22	1:A:2952:LEU:HD23	1.88	0.56
1:B:2849:ARG:NH1	1:B:2918:MET:O	2.38	0.55
1:B:2482:MET:SD	1:B:2482:MET:N	2.79	0.55
1:A:2594:LEU:N	1:A:2596:GLU:OE2	2.39	0.55
1:A:2868:LEU:O	1:A:2871:ARG:NH2	2.39	0.55
1:A:3033:ASN:O	1:A:3037:GLN:NE2	2.40	0.55
1:B:2293:LEU:HD21	1:B:2340:VAL:HG21	1.87	0.55
1:A:2668:GLU:OE1	1:A:2712:ARG:NH1	2.40	0.55
1:B:2868:LEU:O	1:B:2871:ARG:NH2	2.39	0.55
1:B:2248:LYS:NZ	1:B:2281:TYR:O	2.40	0.55
1:A:2482:MET:SD	1:A:2482:MET:N	2.80	0.55
1:B:2174:SER:HB3	1:B:2219:PHE:HB2	1.89	0.55
1:B:2356:ILE:HB	1:B:2361:LEU:HD23	1.88	0.55
1:A:3022:GLU:OE2	1:B:2400:ARG:NE	2.38	0.54
1:B:2948:ILE:HG22	1:B:2952:LEU:HD23	1.88	0.54
1:A:2715:LEU:HD23	1:A:2769:TRP:HB2	1.88	0.54
1:B:2395:ASP:OD2	1:B:2486:ARG:NE	2.37	0.54
1:B:2594:LEU:N	1:B:2596:GLU:OE2	2.39	0.54
1:A:2201:VAL:HA	1:A:2204:LYS:HG2	1.88	0.54
1:A:2248:LYS:NZ	1:A:2281:TYR:O	2.40	0.54
1:B:2668:GLU:OE1	1:B:2712:ARG:NH1	2.39	0.54
1:A:2554:HIS:HA	1:A:2557:LEU:HD22	1.87	0.54
1:B:2217:PHE:HZ	1:B:2262:ALA:HA	1.70	0.54
1:B:2345:LEU:HD11	1:B:2356:ILE:HD13	1.90	0.54
1:B:2554:HIS:HA	1:B:2557:LEU:HD22	1.88	0.53
1:B:2846:PHE:HA	1:B:2849:ARG:HG2	1.90	0.53
1:A:2525:ALA:HB1	1:A:2956:PRO:HD2	1.91	0.53
1:A:2846:PHE:HA	1:A:2849:ARG:HG2	1.90	0.53
1:B:2357:MET:SD	1:B:2358:GLN:NE2	2.82	0.53
1:A:2879:ASN:ND2	1:A:2882:SER:OG	2.38	0.53
1:B:2750:LEU:HB2	1:B:2858:THR:HG21	1.91	0.52
1:B:2525:ALA:HB1	1:B:2956:PRO:HD2	1.91	0.52
1:B:2939:ARG:NH2	1:B:3031:GLN:OE1	2.41	0.52
1:A:2395:ASP:OD2	1:A:2486:ARG:NE	2.36	0.52
1:B:1695:SER:HA	1:B:2166:VAL:HG11	1.92	0.52
1:B:2486:ARG:NH1	1:B:2950:GLU:OE2	2.42	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:2610:ARG:HG3	1:B:2617:VAL:HG21	1.91	0.52
1:B:2517:LEU:HD23	1:B:2517:LEU:H	1.74	0.52
1:B:2275:ILE:HD12	1:B:2295:GLU:HG3	1.90	0.52
1:A:2750:LEU:HB2	1:A:2858:THR:HG21	1.90	0.52
1:A:2357:MET:SD	1:A:2358:GLN:NE2	2.83	0.52
1:B:2289:SER:HB3	1:B:2319:LEU:HD21	1.91	0.52
1:B:2849:ARG:HH11	1:B:2919:GLY:HA3	1.73	0.52
1:A:2486:ARG:NH1	1:A:2950:GLU:OE2	2.42	0.51
1:A:2275:ILE:HD12	1:A:2295:GLU:HG3	1.92	0.51
1:A:2610:ARG:HG3	1:A:2617:VAL:HG21	1.92	0.51
1:B:2598:ARG:HH21	1:B:2956:PRO:HB2	1.75	0.51
1:A:2626:ALA:HB1	1:A:2656:LEU:HD22	1.92	0.51
1:A:2517:LEU:H	1:A:2517:LEU:HD23	1.74	0.51
1:A:2849:ARG:HH11	1:A:2919:GLY:HA3	1.74	0.51
1:B:1684:SER:O	1:B:2151:ARG:NH2	2.44	0.51
1:A:2598:ARG:HH21	1:A:2956:PRO:HB2	1.76	0.51
1:A:2750:LEU:HB3	1:A:2854:ARG:HH21	1.76	0.51
1:A:2551:ASP:OD1	1:A:2552:HIS:N	2.44	0.50
1:B:2750:LEU:HD22	1:B:2854:ARG:HH21	1.76	0.50
1:A:2724:GLN:HA	1:A:2727:VAL:HG22	1.94	0.50
1:B:3012:ARG:NE	1:B:3015:GLU:OE2	2.45	0.50
1:A:2462:PHE:HA	1:A:2465:LYS:HE2	1.94	0.49
1:A:2238:GLU:O	1:A:2239:MET:HG3	2.12	0.49
1:B:2462:PHE:HA	1:B:2465:LYS:HE2	1.93	0.49
1:A:2268:THR:HB	1:A:2302:LYS:HE2	1.94	0.49
1:B:1420:LEU:HA	1:B:1426:ALA:H	1.77	0.49
1:B:2238:GLU:O	1:B:2239:MET:HG3	2.12	0.49
1:B:2551:ASP:OD1	1:B:2552:HIS:N	2.44	0.49
1:B:2626:ALA:HB1	1:B:2656:LEU:HD22	1.93	0.49
1:A:2345:LEU:HD11	1:A:2356:ILE:HD13	1.94	0.49
1:B:2503:MET:SD	1:B:2504:MET:N	2.86	0.49
1:B:3041:ASP:OD1	1:B:3041:ASP:N	2.46	0.49
1:A:1420:LEU:HA	1:A:1426:ALA:H	1.77	0.49
1:B:2724:GLN:HA	1:B:2727:VAL:HG22	1.95	0.49
1:B:2832:ARG:NH2	1:B:2916:ASP:OD2	2.41	0.49
1:A:2503:MET:SD	1:A:2504:MET:N	2.86	0.49
1:A:2523:LEU:HD21	1:A:2545:ILE:HG22	1.95	0.49
1:A:2356:ILE:HB	1:A:2361:LEU:HD23	1.94	0.49
1:B:2523:LEU:HD21	1:B:2545:ILE:HG22	1.95	0.49
1:B:2640:THR:OG1	1:B:2642:ARG:NH2	2.46	0.48
1:A:2132:LEU:HD13	1:A:2135:LEU:HD21	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:2167:TYR:HA	1:B:2170:TYR:HD2	1.78	0.48
1:B:2750:LEU:HB3	1:B:2854:ARG:HH21	1.78	0.48
1:B:2132:LEU:HD13	1:B:2135:LEU:HD21	1.96	0.48
1:A:2167:TYR:HA	1:A:2170:TYR:HD2	1.79	0.48
1:A:1684:SER:O	1:A:2151:ARG:NH2	2.47	0.48
1:A:2330:LEU:HA	1:A:2333:THR:HG22	1.95	0.48
1:B:2268:THR:HB	1:B:2302:LYS:HE2	1.96	0.47
1:B:2128:LEU:HD21	1:B:2226:LEU:HD11	1.95	0.47
1:B:2667:MET:SD	1:B:2758:VAL:HG12	2.54	0.47
1:A:1420:LEU:O	1:A:1425:GLN:N	2.39	0.47
1:A:1697:THR:N	1:A:2164:GLU:OE2	2.46	0.47
1:A:2912:ARG:HA	1:A:2915:VAL:HG12	1.97	0.47
1:A:3041:ASP:OD1	1:A:3041:ASP:N	2.46	0.47
1:B:2776:ILE:HB	1:B:2780:LEU:HD23	1.97	0.47
1:A:2549:SER:HA	1:A:2556:THR:HG21	1.96	0.47
1:A:2667:MET:SD	1:A:2758:VAL:HG12	2.54	0.47
1:B:2549:SER:HA	1:B:2556:THR:HG21	1.97	0.47
1:B:2639:LYS:HB3	1:B:2692:LEU:HD13	1.96	0.46
1:B:2398:TYR:OH	1:B:2494:ASN:ND2	2.48	0.46
1:A:2639:LYS:HB3	1:A:2692:LEU:HD13	1.96	0.46
1:A:2398:TYR:OH	1:A:2494:ASN:ND2	2.49	0.46
1:B:2912:ARG:HA	1:B:2915:VAL:HG12	1.97	0.46
1:A:2668:GLU:HG3	1:A:2669:ILE:H	1.81	0.46
1:A:2776:ILE:HB	1:A:2780:LEU:HD23	1.98	0.45
1:B:1420:LEU:O	1:B:1425:GLN:N	2.39	0.45
1:A:2841:ASP:OD1	1:A:2841:ASP:N	2.45	0.45
1:B:2668:GLU:HG3	1:B:2669:ILE:H	1.81	0.45
1:A:3041:ASP:OD2	1:A:3044:ASN:ND2	2.38	0.45
1:B:2634:ASP:N	1:B:2634:ASP:OD1	2.48	0.45
1:B:2169:LEU:H	1:B:2169:LEU:HD23	1.82	0.45
1:A:2128:LEU:HD21	1:A:2226:LEU:HD11	1.97	0.45
1:B:2796:PHE:CD2	1:B:2799:PHE:HB2	2.52	0.45
1:B:2875:ASN:OD1	1:B:2889:ASP:N	2.33	0.45
1:A:2832:ARG:NH2	1:A:2916:ASP:OD2	2.42	0.45
1:A:2750:LEU:HD22	1:A:2854:ARG:HH21	1.82	0.45
1:A:2785:ASP:OD1	1:A:2785:ASP:N	2.49	0.45
1:B:2212:LEU:O	1:B:2215:SER:OG	2.24	0.45
1:A:2640:THR:OG1	1:A:2642:ARG:NH2	2.49	0.44
1:B:2841:ASP:N	1:B:2841:ASP:OD1	2.44	0.44
1:B:3041:ASP:OD2	1:B:3044:ASN:ND2	2.38	0.44
1:A:2700:LYS:HE2	1:A:2700:LYS:HB2	1.90	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:2330:LEU:HA	1:B:2333:THR:HG22	1.99	0.44
1:A:2796:PHE:CD2	1:A:2799:PHE:HB2	2.52	0.44
1:A:3012:ARG:NE	1:A:3015:GLU:OE2	2.50	0.44
1:B:2170:TYR:HA	1:B:2173:LEU:HG	2.00	0.44
1:A:2123:SER:OG	1:A:2124:TYR:N	2.51	0.44
1:A:2835:CYS:HG	1:A:2845:TRP:HE1	1.53	0.44
1:A:1695:SER:HA	1:A:2166:VAL:HG11	1.99	0.44
1:B:2742:ASN:HD22	1:B:2744:GLU:H	1.65	0.44
1:A:2614:PRO:HG2	1:A:2616:MET:HG3	1.99	0.43
1:A:2876:ILE:H	1:A:2876:ILE:HG12	1.63	0.43
1:B:3012:ARG:HG3	1:B:3016:LYS:HE2	2.00	0.43
1:B:2691:ARG:HB3	1:B:2701:ILE:HB	1.99	0.43
1:A:2634:ASP:OD1	1:A:2634:ASP:N	2.48	0.43
1:B:2463:LEU:HD11	1:B:2490:LEU:HB3	2.00	0.43
1:B:2785:ASP:OD1	1:B:2785:ASP:N	2.49	0.43
1:B:2614:PRO:HG2	1:B:2616:MET:HG3	1.99	0.43
1:B:2147:LEU:HD12	1:B:2179:ILE:HG12	2.00	0.43
1:A:3012:ARG:HG3	1:A:3016:LYS:HE2	2.00	0.43
1:A:2170:TYR:HA	1:A:2173:LEU:HG	2.01	0.43
1:A:2212:LEU:O	1:A:2215:SER:OG	2.24	0.42
1:B:2234:LEU:HA	1:B:2237:LYS:HE3	2.01	0.42
1:B:2801:CYS:O	1:B:2805:MET:HG2	2.19	0.42
1:B:2939:ARG:HH12	1:B:3027:SER:HA	1.83	0.42
1:A:2906:VAL:HG13	1:A:3039:ALA:HA	2.01	0.42
1:A:2643:LYS:HB3	1:A:2692:LEU:HD22	2.02	0.42
1:A:2673:HIS:CE1	1:A:2678:GLY:HA3	2.55	0.42
1:A:2482:MET:HG2	1:A:2738:LEU:HD21	2.00	0.42
1:B:2160:LYS:HE2	1:B:2160:LYS:HB3	1.93	0.42
1:B:2673:HIS:CE1	1:B:2678:GLY:HA3	2.55	0.42
1:B:2955:ASP:OD1	1:B:2955:ASP:N	2.53	0.42
1:A:2939:ARG:NH2	1:A:3031:GLN:OE1	2.52	0.42
1:B:2910:LEU:HB3	1:B:3039:ALA:HB1	2.01	0.42
1:A:2312:LEU:HD12	1:A:2313:LYS:HG3	2.01	0.42
1:A:2662:VAL:O	1:A:2682:THR:OG1	2.38	0.42
1:B:2123:SER:OG	1:B:2124:TYR:N	2.49	0.42
1:A:2463:LEU:HD11	1:A:2490:LEU:HB3	2.02	0.42
1:B:3012:ARG:O	1:B:3015:GLU:HG3	2.20	0.42
1:B:2269:GLN:HE22	1:B:2273:ARG:HD3	1.85	0.41
1:A:2519:LEU:HD21	1:A:2523:LEU:HD13	2.03	0.41
1:A:2595:ASP:OD1	1:A:2595:ASP:N	2.53	0.41
1:A:3012:ARG:O	1:A:3015:GLU:HG3	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:2724:GLN:O	1:B:2728:MET:HG2	2.20	0.41
1:B:2227:ARG:HD2	1:B:2230:ILE:HD11	2.01	0.41
1:B:2643:LYS:HB3	1:B:2692:LEU:HD22	2.01	0.41
1:B:2482:MET:HG2	1:B:2738:LEU:HD21	2.01	0.41
1:B:2519:LEU:HD21	1:B:2523:LEU:HD13	2.01	0.41
1:B:2595:ASP:OD1	1:B:2595:ASP:N	2.53	0.41
1:B:2662:VAL:O	1:B:2682:THR:OG1	2.39	0.41
1:B:2871:ARG:HE	1:B:2875:ASN:HD22	1.68	0.41
1:A:2227:ARG:HD2	1:A:2230:ILE:HD11	2.01	0.41
1:A:2730:GLN:O	1:A:2733:GLN:HG3	2.21	0.41
1:A:2833:TYR:HA	1:A:2836:MET:SD	2.61	0.41
1:A:2871:ARG:HE	1:A:2875:ASN:HD22	1.69	0.41
1:B:2244:ARG:O	1:B:2247:ILE:HG13	2.20	0.41
1:B:2488:CYS:HA	1:B:2491:TRP:HB3	2.03	0.41
1:A:2169:LEU:HD23	1:A:2169:LEU:H	1.86	0.41
1:A:2801:CYS:O	1:A:2805:MET:HG2	2.20	0.41
1:A:2875:ASN:OD1	1:A:2889:ASP:N	2.34	0.41
1:B:2696:VAL:HG23	1:B:2697:ASN:H	1.85	0.41
1:A:2691:ARG:HB3	1:A:2701:ILE:HB	2.01	0.41
1:B:2352:ASN:OD1	1:B:2352:ASN:N	2.54	0.41
1:B:2804:LYS:NZ	1:B:3053:LYS:O	2.37	0.41
1:B:2923:VAL:HG13	1:B:2927:PHE:HB3	2.02	0.41
1:A:2255:LEU:HD13	1:A:2255:LEU:HA	1.88	0.41
1:A:2696:VAL:HG23	1:A:2697:ASN:H	1.86	0.41
1:A:2724:GLN:O	1:A:2728:MET:HG2	2.20	0.41
1:B:2973:ARG:HB2	1:B:2974:PRO:HD3	2.03	0.40
1:A:2361:LEU:HB3	1:A:2390:LEU:HG	2.03	0.40
1:B:2833:TYR:HA	1:B:2836:MET:SD	2.61	0.40
1:A:2554:HIS:HB2	1:A:2670:LYS:HE2	2.03	0.40
1:B:2460:LYS:HB3	1:B:2460:LYS:HE3	1.87	0.40
1:B:2730:GLN:O	1:B:2733:GLN:HG3	2.21	0.40
1:A:2019:TYR:HA	1:A:2929:ARG:HD3	2.02	0.40
1:A:2805:MET:HB3	1:A:2978:THR:HG23	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2476/3056 (81%)	2357 (95%)	119 (5%)	0	100	100
1	B	2475/3056 (81%)	2367 (96%)	108 (4%)	0	100	100
All	All	4951/6112 (81%)	4724 (95%)	227 (5%)	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	757/2780 (27%)	710 (94%)	47 (6%)	18	46
1	B	757/2780 (27%)	710 (94%)	47 (6%)	18	46
All	All	1514/5560 (27%)	1420 (94%)	94 (6%)	22	46

All (94) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2138	ARG
1	A	2147	LEU
1	A	2161	ARG
1	A	2169	LEU
1	A	2237	LYS
1	A	2239	MET
1	A	2255	LEU
1	A	2257	GLU

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Mol	Chain	Res	Type
1	A	2270	LEU
1	A	2288	VAL
1	A	2293	LEU
1	A	2315	MET
1	A	2363	LYS
1	A	2390	LEU
1	A	2419	ARG
1	A	2445	LEU
1	A	2453	ARG
1	A	2505	LYS
1	A	2517	LEU
1	A	2519	LEU
1	A	2523	LEU
1	A	2557	LEU
1	A	2618	ARG
1	A	2624	CYS
1	A	2637	GLN
1	A	2640	THR
1	A	2642	ARG
1	A	2659	LEU
1	A	2696	VAL
1	A	2698	LEU
1	A	2708	ASP
1	A	2730	GLN
1	A	2742	ASN
1	A	2745	THR
1	A	2747	LYS
1	A	2781	VAL
1	A	2836	MET
1	A	2868	LEU
1	A	2890	LEU
1	A	2894	PHE
1	A	2904	GLU
1	A	2938	MET
1	A	2966	LYS
1	A	2970	LEU
1	A	3017	LEU
1	A	3025	VAL
1	A	3048	LEU
1	B	2138	ARG
1	B	2147	LEU
1	B	2161	ARG

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Mol	Chain	Res	Type
1	B	2169	LEU
1	B	2191	ARG
1	B	2237	LYS
1	B	2239	MET
1	B	2257	GLU
1	B	2270	LEU
1	B	2288	VAL
1	B	2293	LEU
1	B	2315	MET
1	B	2363	LYS
1	B	2390	LEU
1	B	2419	ARG
1	B	2453	ARG
1	B	2505	LYS
1	B	2517	LEU
1	B	2519	LEU
1	B	2523	LEU
1	B	2557	LEU
1	B	2618	ARG
1	B	2624	CYS
1	B	2637	GLN
1	B	2640	THR
1	B	2642	ARG
1	B	2659	LEU
1	B	2696	VAL
1	B	2698	LEU
1	B	2708	ASP
1	B	2730	GLN
1	B	2742	ASN
1	B	2745	THR
1	B	2747	LYS
1	B	2781	VAL
1	B	2836	MET
1	B	2841	ASP
1	B	2868	LEU
1	B	2890	LEU
1	B	2894	PHE
1	B	2904	GLU
1	B	2938	MET
1	B	2966	LYS
1	B	2970	LEU
1	B	3017	LEU

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Mol	Chain	Res	Type
1	B	3025	VAL
1	B	3048	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2177	GLN
1	A	2195	HIS
1	A	2282	ASN
1	A	2397	GLN
1	A	2399	GLN
1	A	2469	ASN
1	A	2494	ASN
1	A	2637	GLN
1	A	2673	HIS
1	A	2729	GLN
1	A	2740	GLN
1	A	2742	ASN
1	A	2879	ASN
1	A	2896	GLN
1	A	2971	GLN
1	A	3014	GLN
1	B	2177	GLN
1	B	2195	HIS
1	B	2282	ASN
1	B	2397	GLN
1	B	2399	GLN
1	B	2494	ASN
1	B	2637	GLN
1	B	2673	HIS
1	B	2729	GLN
1	B	2730	GLN
1	B	2733	GLN
1	B	2740	GLN
1	B	2742	ASN
1	B	2879	ASN
1	B	2896	GLN
1	B	2971	GLN
1	B	3014	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-9950. 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 ⓘ

6.1.1 Primary map

| X | Y | Z |
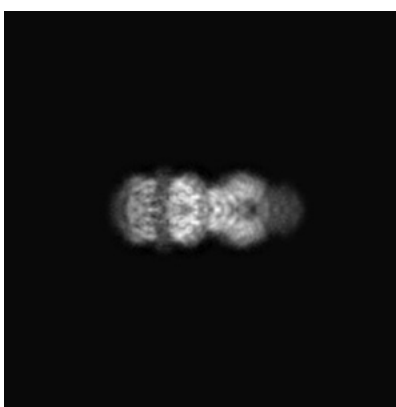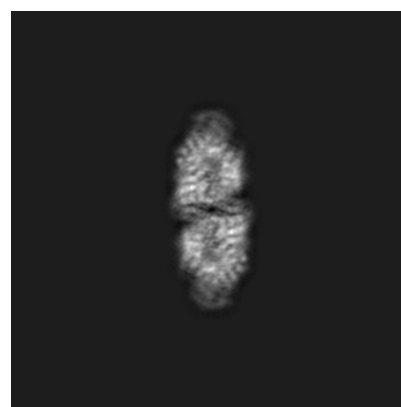
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
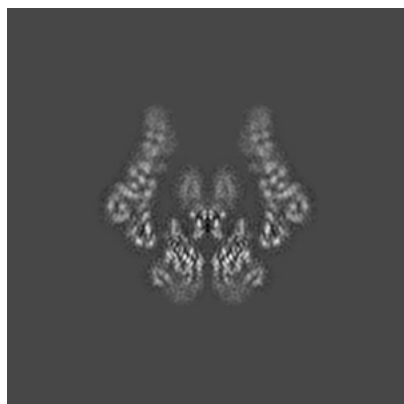
6.2.1 Primary map
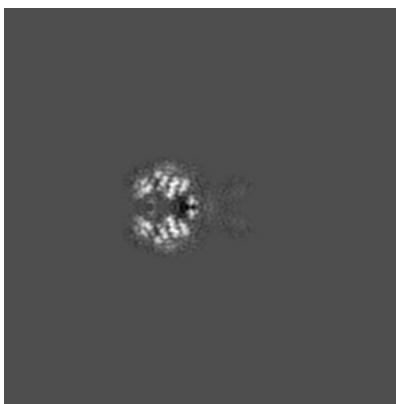
| X Index: 128 | Y Index: 128 | Z Index: 128 |
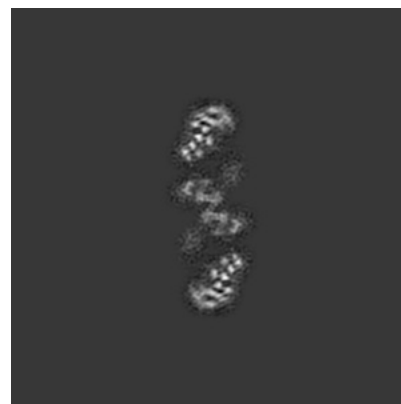
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
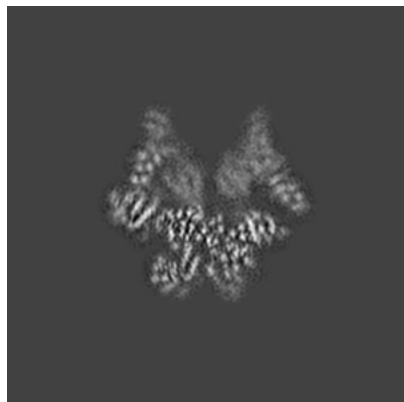
6.3.1 Primary map
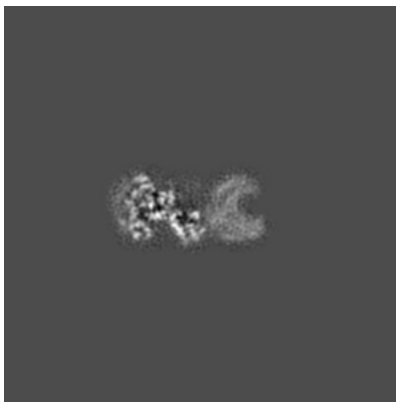
| X Index: 136 | Y Index: 141 | Z Index: 112 |

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

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

6.4.1 Primary map

| X | Y | Z |
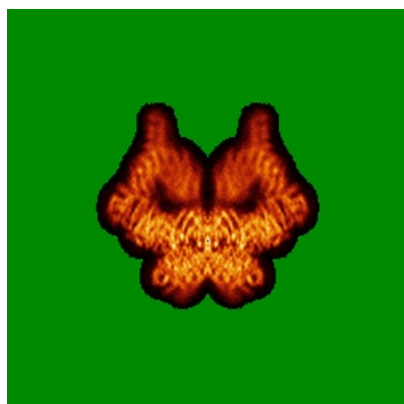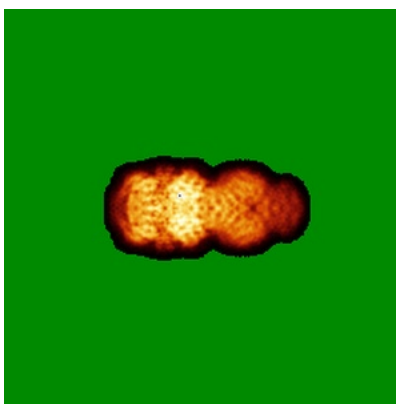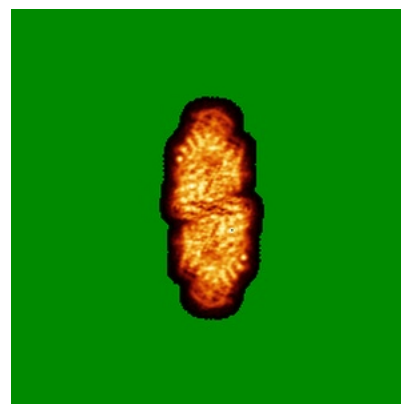
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z
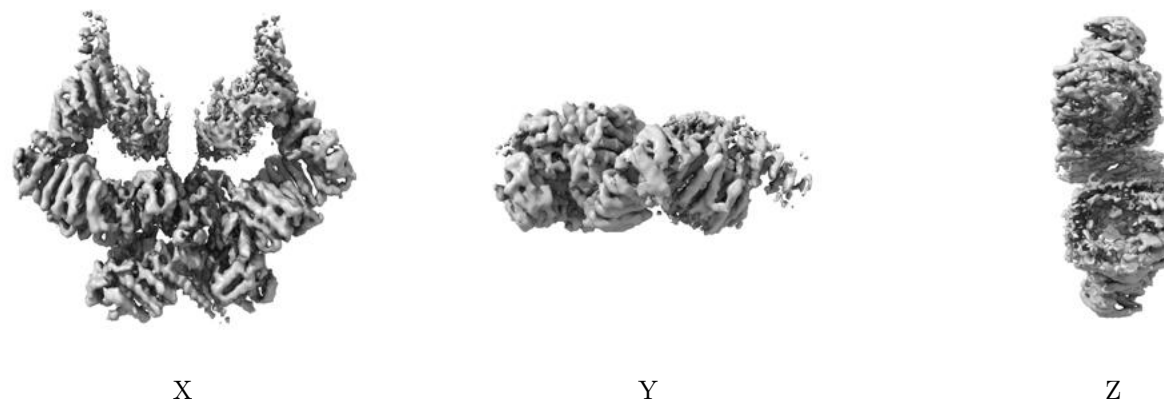
The images above show the 3D surface view of the map at the recommended contour level 0.019. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

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

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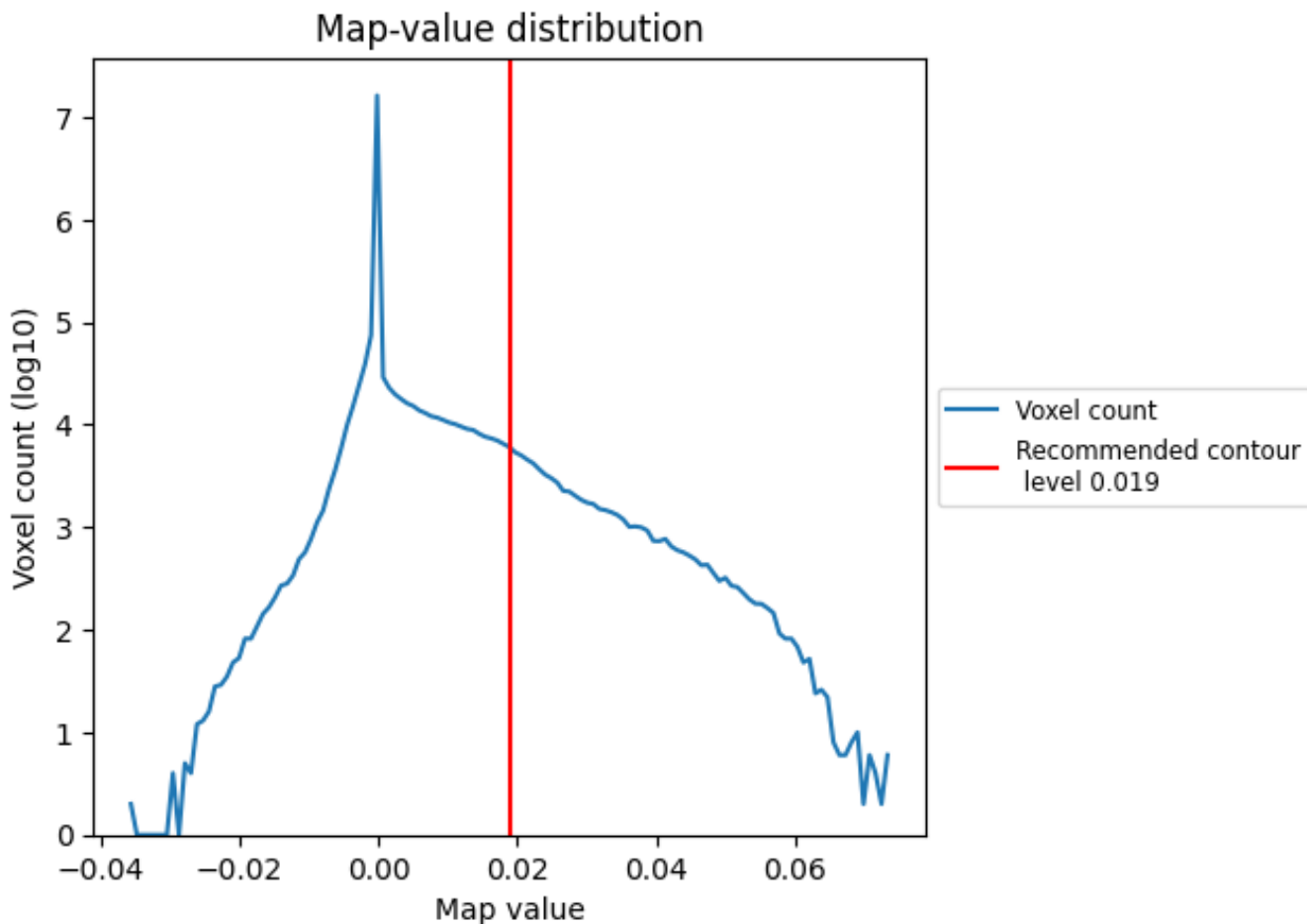
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
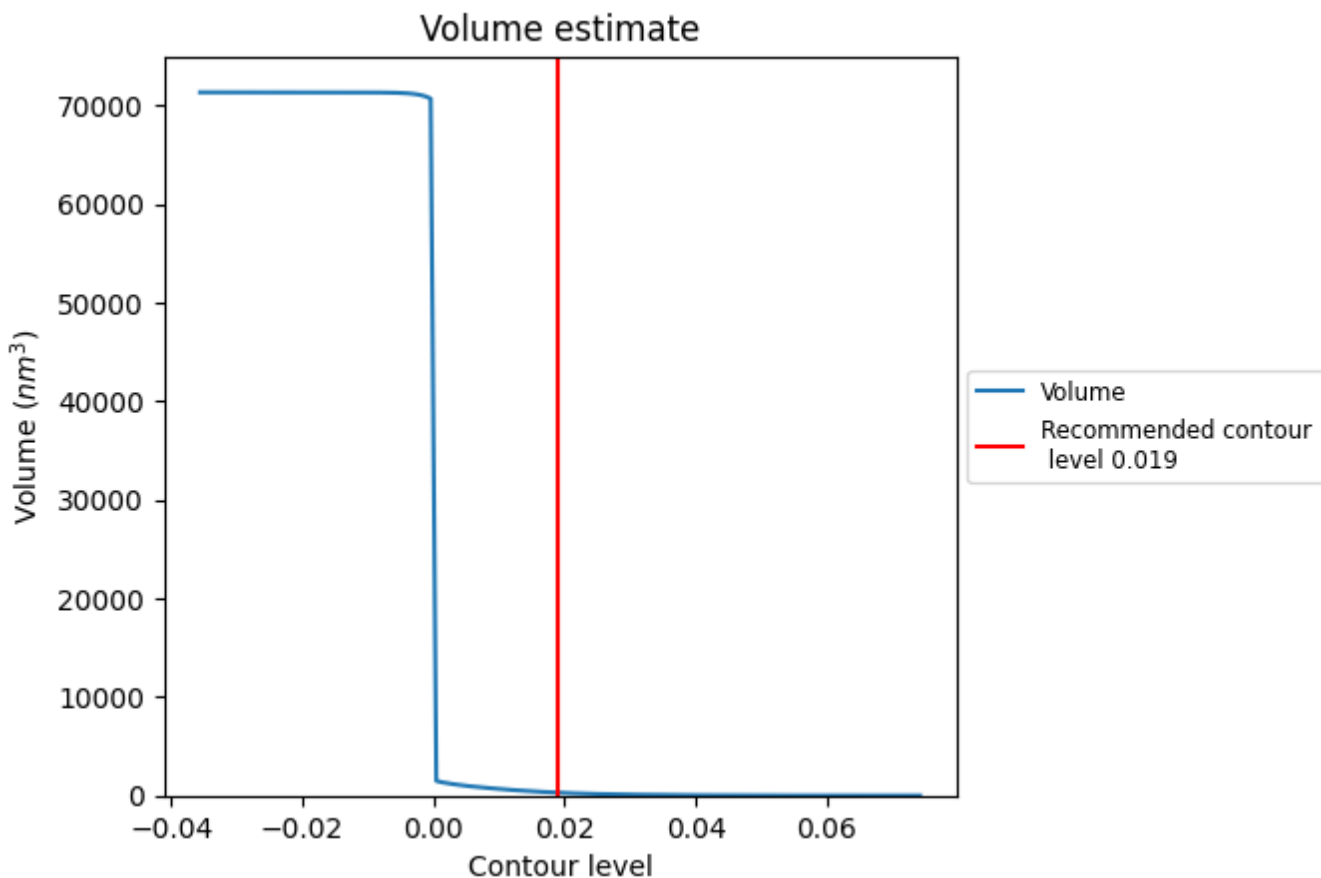
The volume at the recommended contour level is 292 nm^3; this corresponds to an approximate mass of 264 kDa.

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 ⓘ
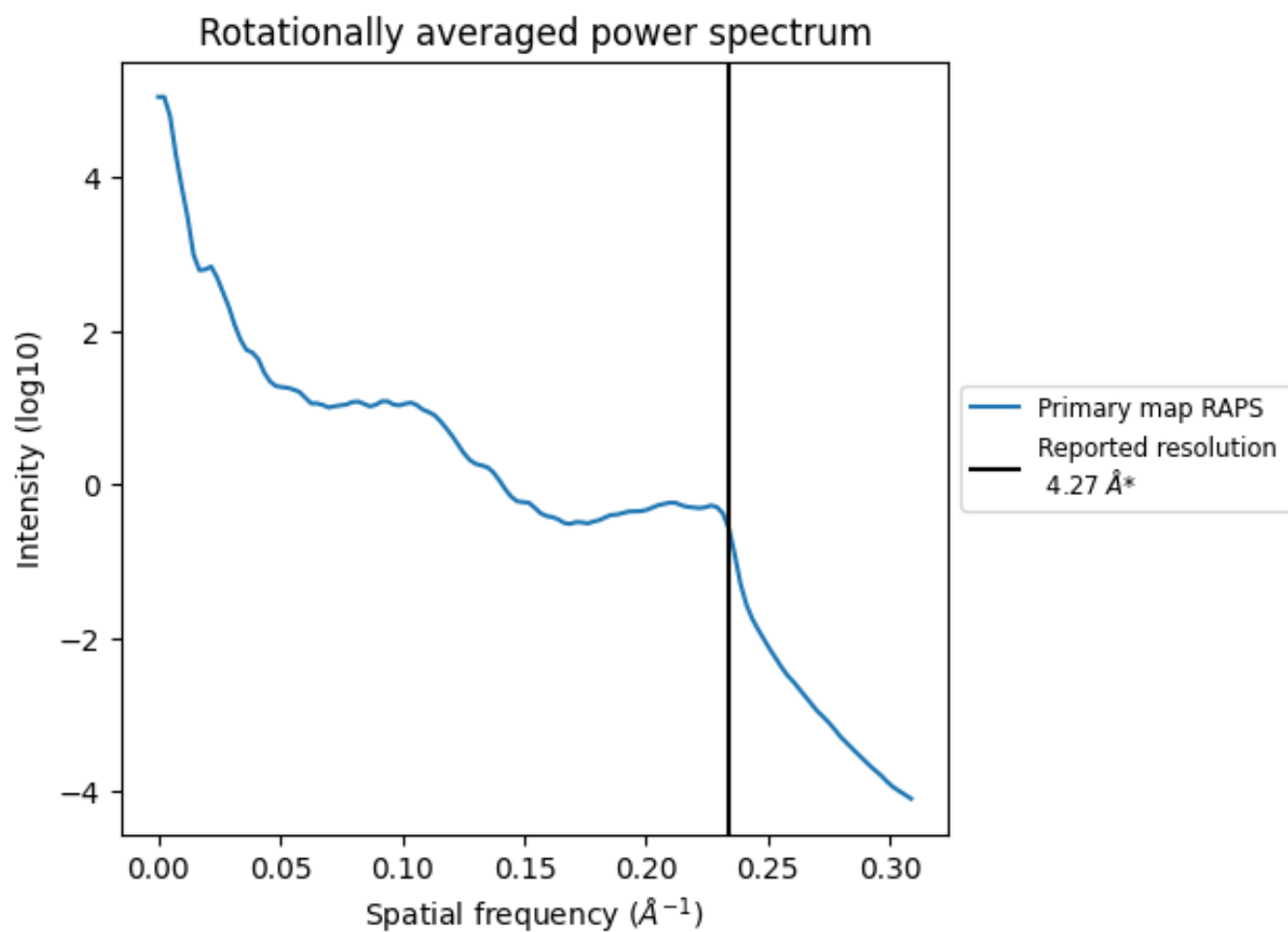
*Reported resolution corresponds to spatial frequency of 0.234 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-9950 and PDB model 6K9L. Per-residue inclusion information can be found in section 3 on page 4.

9.1   Map-model overlay ⓘ

| X | Y | Z |
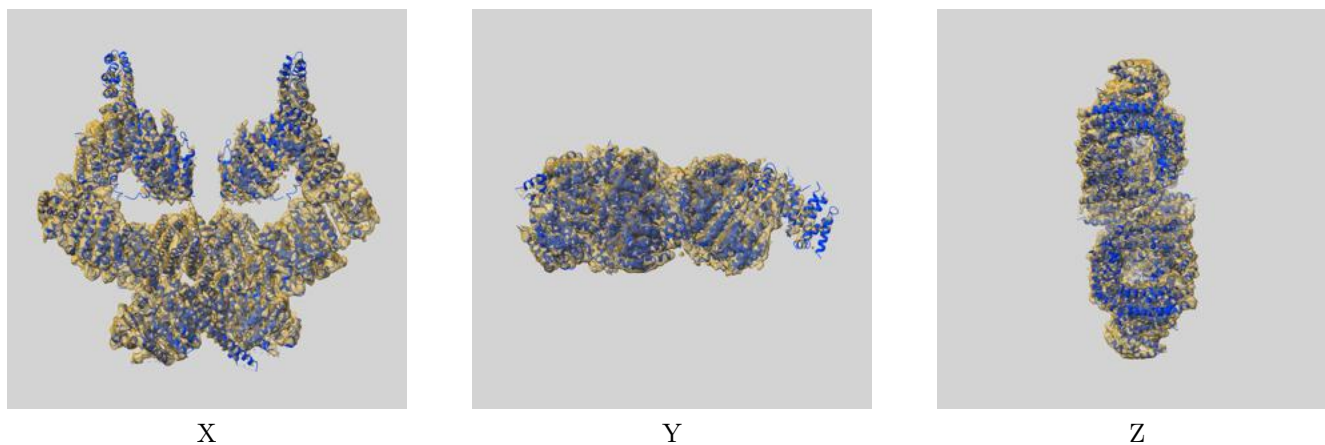
The images above show the 3D surface view of the map at the recommended contour level 0.019 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)

X　　　　　　　　Y　　　　　　　　Z
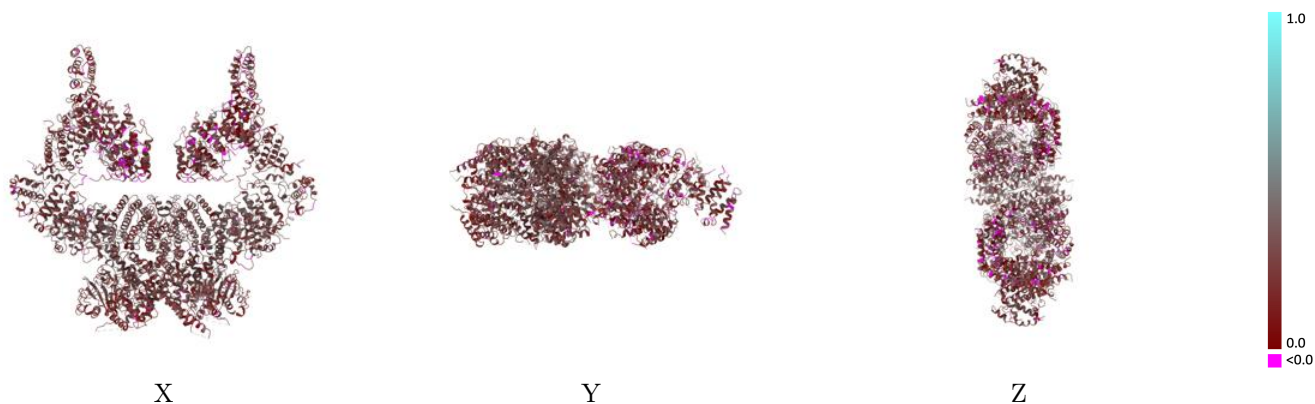
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
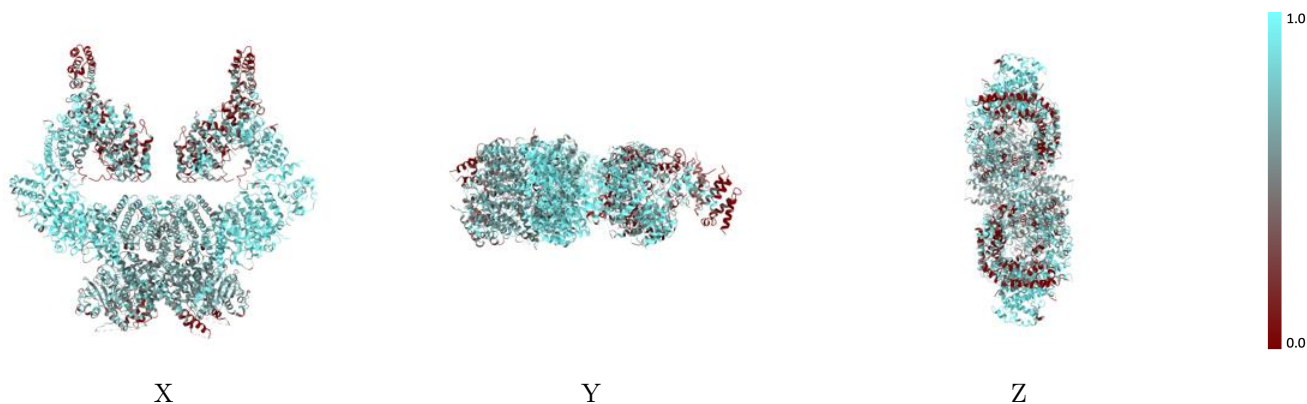
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.019).

9.4 Atom inclusion ⓘ
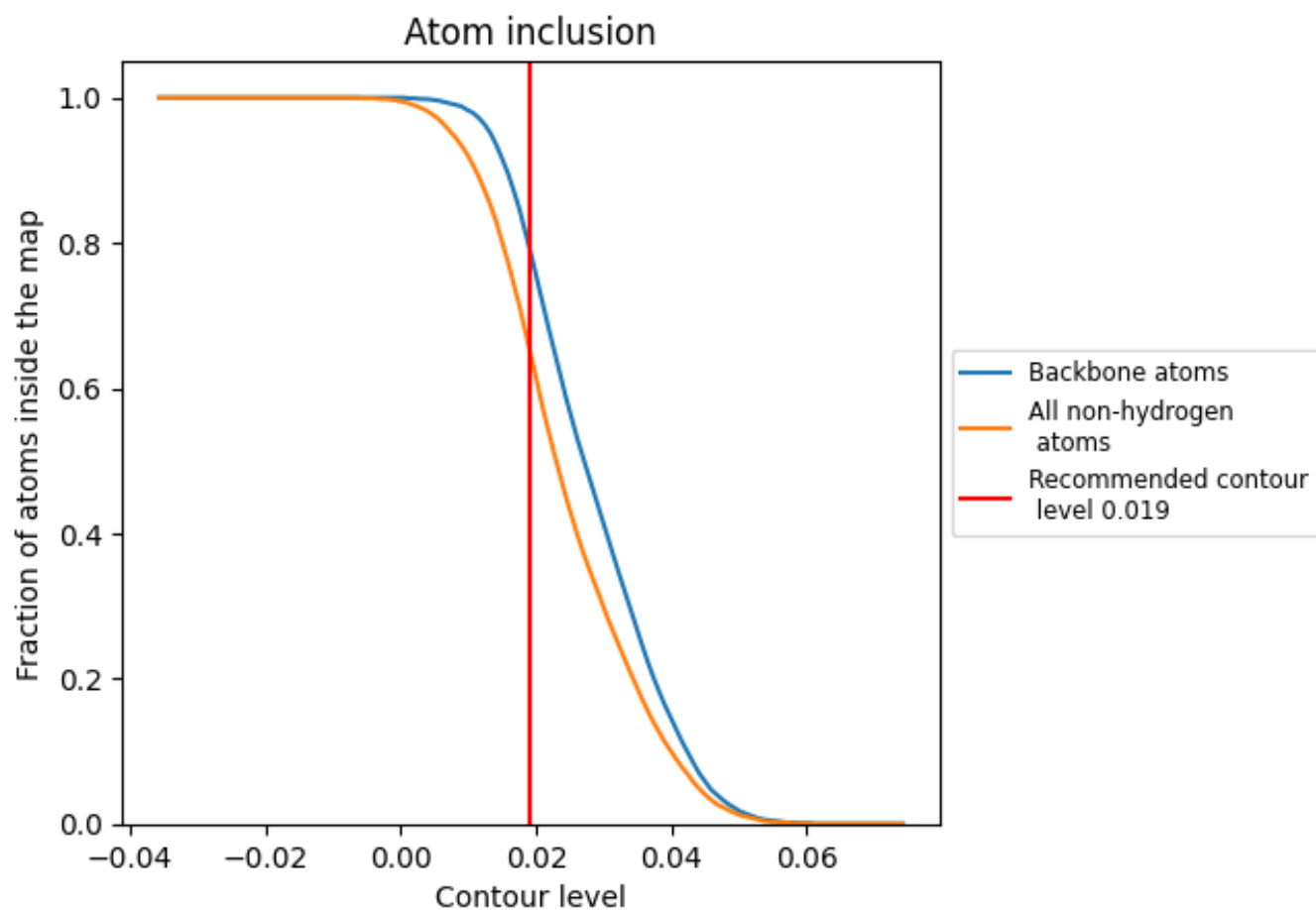
At the recommended contour level, 80% of all backbone atoms, 66% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.019) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6560	0.2470
A	0.6550	0.2470
B	0.6560	0.2470

1.0

0.0
<0.0