Full wwPDB EM Validation Report ⓘ

Jun 16, 2025 – 03:45 PM JST

PDB ID	:	8K98 / pdb_00008k98
EMDB ID	:	EMD-36980
Title	:	Cryo-EM structure of DSR2-TTP
Authors	:	Zhang, H.; Li, Z.; Li, X.Z.
Deposited on	:	2023-07-31
Resolution	:	2.90 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:

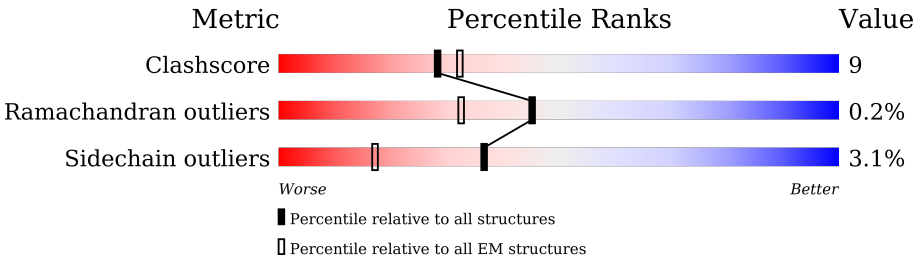
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline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

1 Overall quality at a glance

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

The reported resolution of this entry is 2.90 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	264	5% 29% 12% • 58%
1	D	264	6% 33% 9% 58%
2	B	1005	10% 53% 16% • 31%
2	C	1005	10% 54% 15% • 31%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13415 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 a protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	112	Total	C	N	O	S	0	0
			875	560	135	178	2		
1	D	112	Total	C	N	O	S	0	0
			890	568	137	183	2		

- Molecule 2 is a protein called a protein.

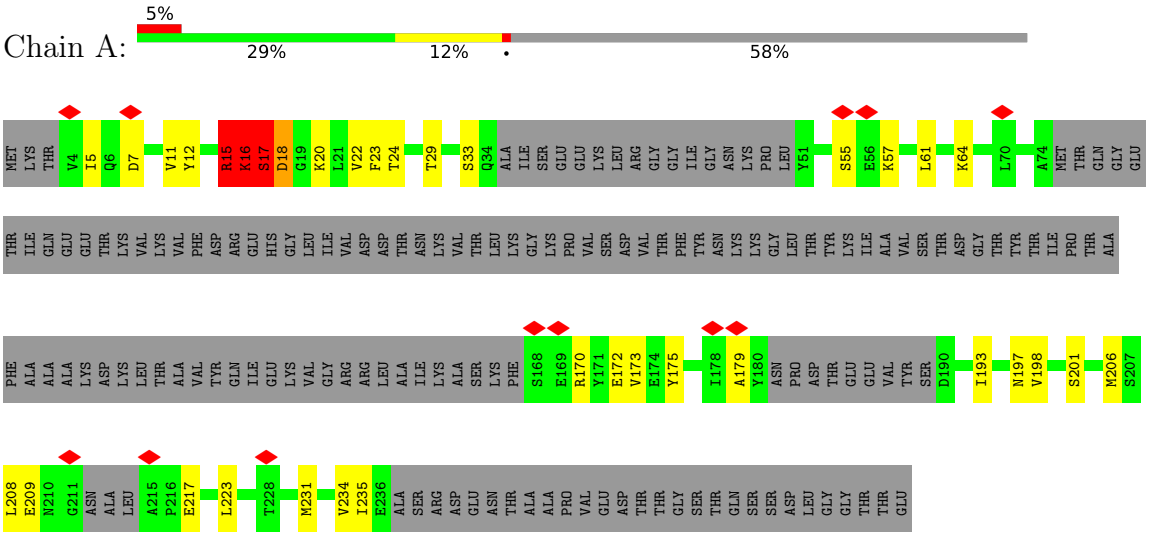
Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	697	Total	C	N	O	S	0	0
			5812	3764	936	1088	24		
2	B	698	Total	C	N	O	S	0	0
			5838	3786	939	1089	24		

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.

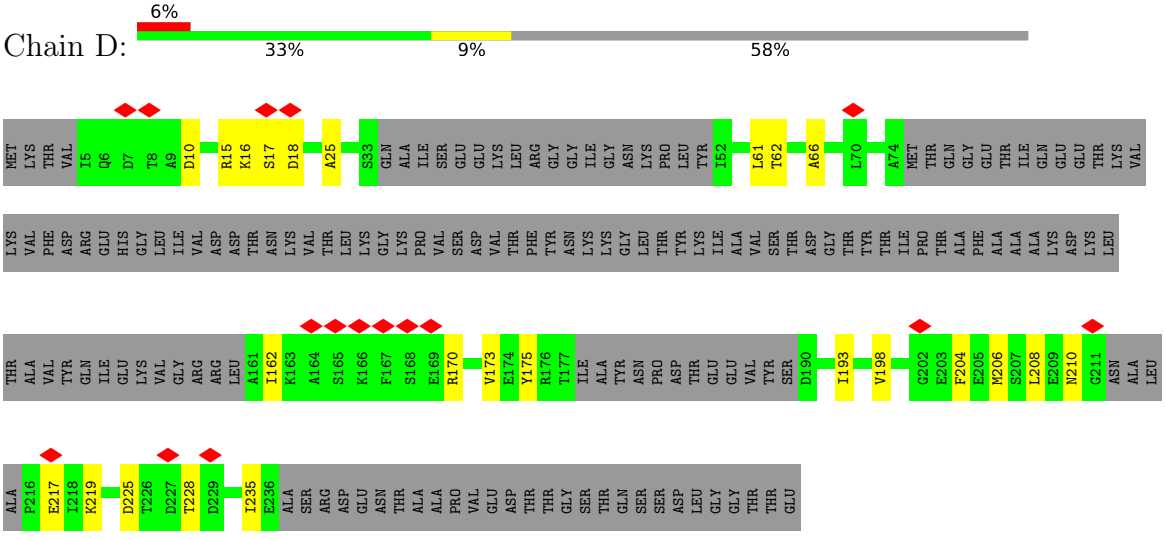
• Molecule 1: a protein

Chain A:



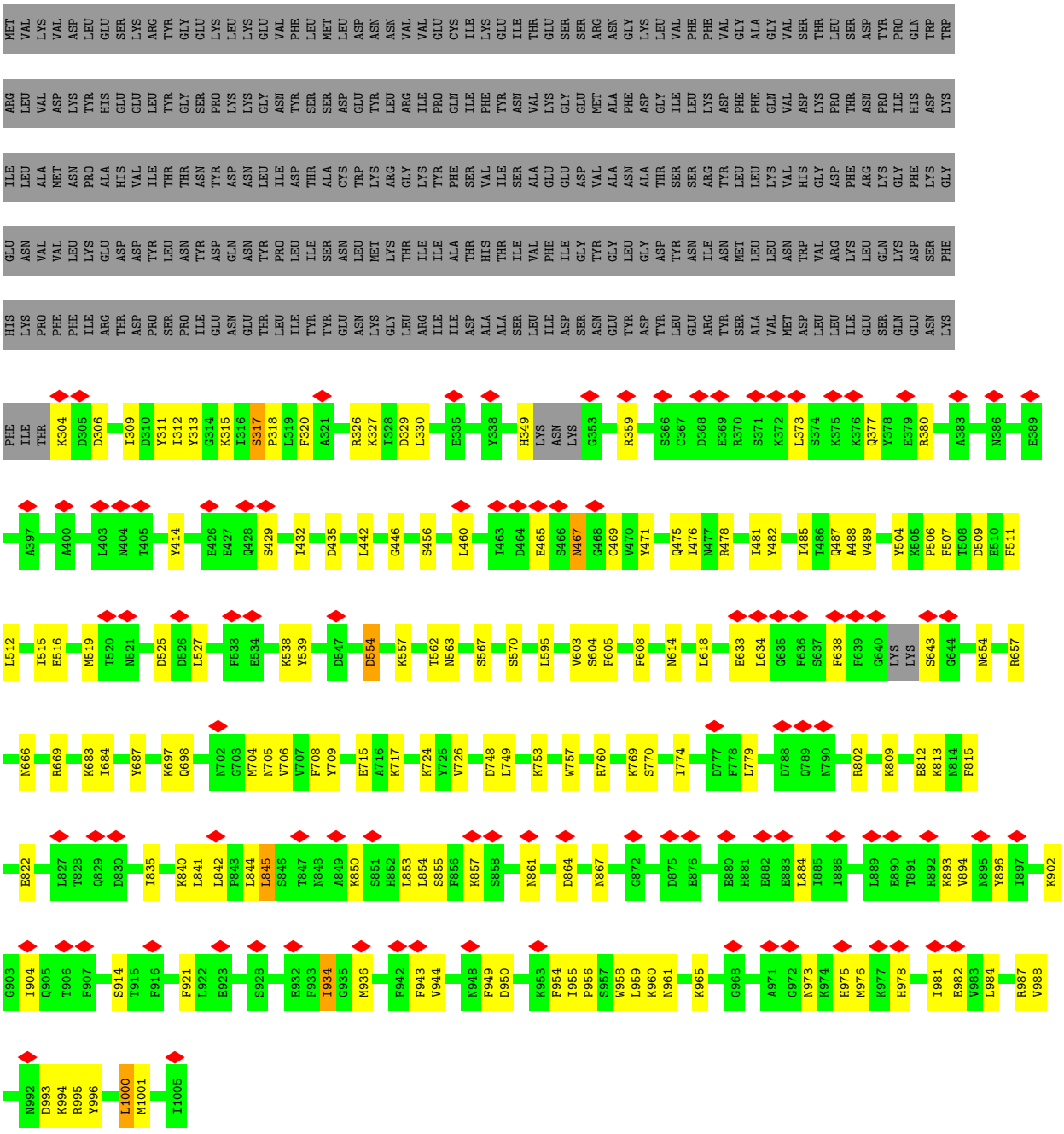
• Molecule 1: a protein

Chain D:



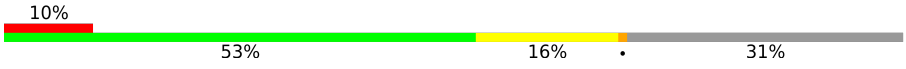
• Molecule 2: a protein

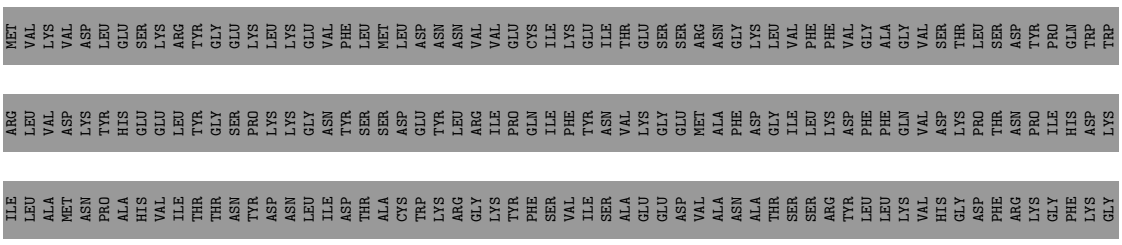
Chain C:

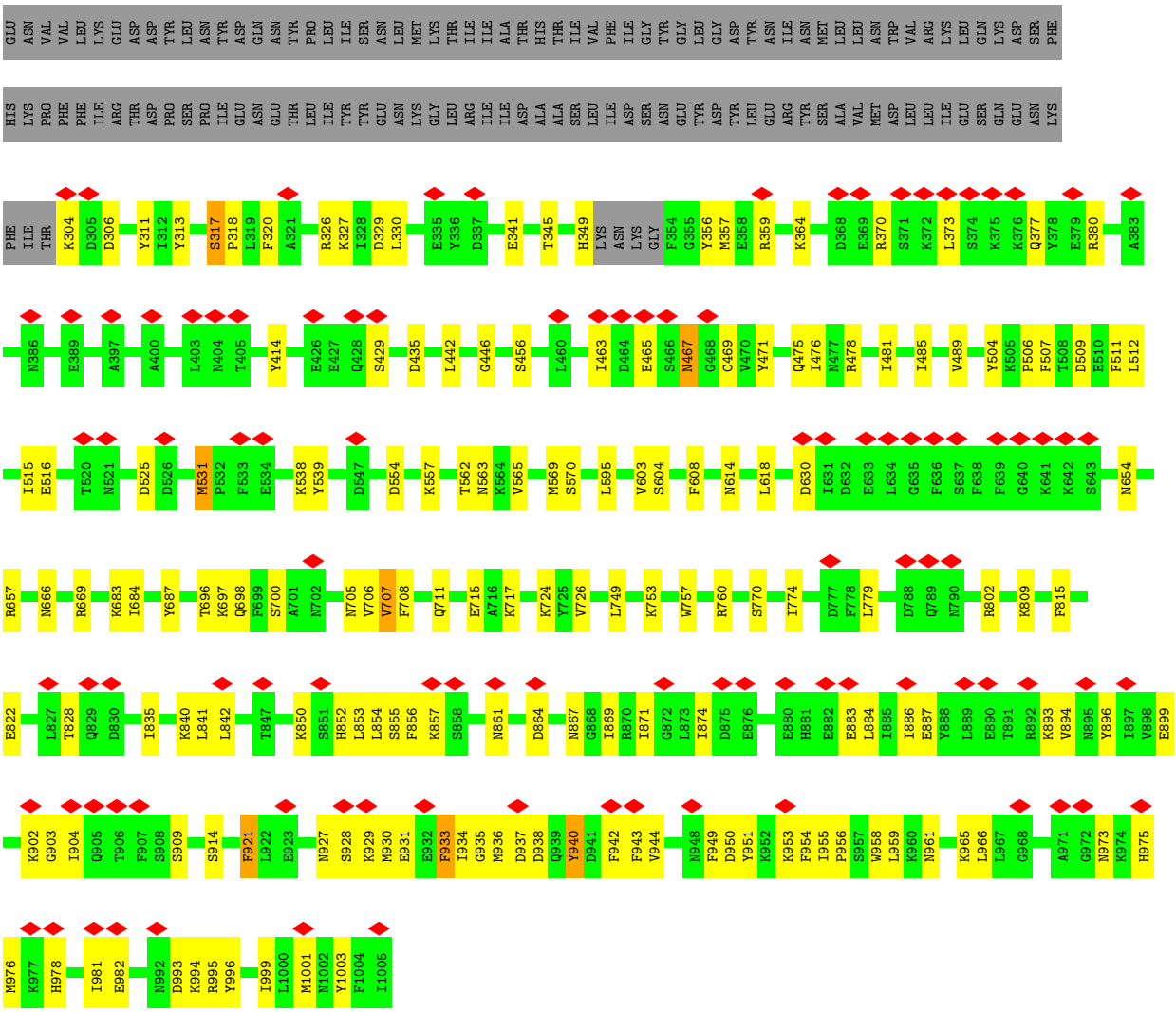


• Molecule 2: a protein

Chain B:






GLU ASN VAL VAL LEU LYS GLU ASP ASP TYR LEU ASN TYR ASP GLN ASN TYR PRO LEU ILE SER ASN LEU MET LYS THR ILE ILE ALA THR HIS THR ILE VAL PHE ILE GLY TYR GLY LEU GLY ASP TYR ASN ILE ASN MET LEU LEU ASN TRP VAL ARG LYS LEU GLN LYS ASP SER PHE
HIS LYS PRO PHE PHE ILE ARG THR ASP PRO SER PRO ILE GLU ASN GLU THR LEU ILE TYR TYR GLU ASN LYS GLY LEU ARG ILE ILE ASP ALA ALA SER LEU ILE ASP SER ASN GLU TYR ASP TYR LEU GLU ARG TYR SER ALA VAL MET ASP LEU LEU ILE GLU SER GLN GLU ASN LYS
PHE ILE THR K304 D305 D306 Y311 I312 Y313 S317 P318 L319 F320 A321 R326 K327 I328 D329 L330 E335 Y336 D337 E341 T345 H349 LYS ASN LYS GLY F354 G355 Y356 M357 E358 R359 K364 D368 E369 R370 S371 K372 L373 S374 K375 K376 Q377 Y378 E379 R380 A383
N386 E389 A397 A400 L403 N404 T405 Y414 E426 E427 Q428 S429 D435 L442 G446 S456 L460 I463 D464 E465 S466 N467 G468 C469 V470 Y471 Q475 I476 N477 R478 I481 I485 V489 Y504 K505 P506 F507 T508 D509 E510 F511 L512
I515 E516 T520 N521 D525 D526 M531 P532 F533 E534 K538 Y539 D547 D554 K557 T562 N563 K564 V565 M569 S570 L595 V603 S604 F608 N614 L618 D630 I631 D632 E633 L634 G635 F636 S637 F638 F639 G640 K641 K642 S643 N654
R657 N666 R669 K683 I684 Y687 T696 K697 Q698 F699 S700 A701 N702 N705 V706 V707 F708 Q711 E715 A716 K717 K724 Y725 V726 L749 K753 W757 R760 S770 I774 D777 F778 L779 D788 Q789 N790 R802 K809 F815
E822 L827 T828 Q829 D830 I835 K840 L841 L842 T847 K850 S851 H852 L853 L854 S855 F856 K857 S858 N861 D864 N867 G868 I869 R870 I871 G872 L873 I874 D875 E876 E880 H881 E882 E883 L884 I885 I886 E887 Y888 L889 E890 T891 R892 K893 V894 N895 Y896 I897 V898 E899
K902 G903 I904 Q905 T906 F907 S908 S909 S914 F921 L922 E923 N927 S928 K929 M930 E931 E932 F933 I934 G935 M936 D937 D938 Q939 Y940 D941 F942 F943 V944 N948 F949 D950 Y951 K952 K953 F954 I955 P956 S957 W958 L959 K960 N961 K965 L966 L967 G968 A971 G972 N973 K974 H975
M976 K977 H978 I981 E982 N992 D993 K994 R995 Y996 I999 L1000 M1001 N1002 Y1003 F1004 I1005

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	20000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.810	Depositor
Minimum map value	-2.353	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.111	Depositor
Recommended contour level	0.461	Depositor
Map size (Å)	217.6, 217.6, 217.6	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85, 0.85, 0.85	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	0.37	1/888 (0.1%)	0.41	1/1198 (0.1%)
1	D	0.09	0/903	0.27	0/1213
2	B	0.12	0/5972	0.33	0/8029
2	C	0.13	0/5943	0.32	1/7991 (0.0%)
All	All	0.15	1/13706 (0.0%)	0.33	2/18431 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	15	ARG	CA-C	-5.55	1.45	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	16	LYS	N-CA-C	-5.70	98.67	110.80
2	C	855	SER	N-CA-C	-5.34	104.35	112.04

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	875	0	809	26	0
1	D	890	0	839	16	0
2	B	5838	0	5700	112	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	5812	0	5662	105	0
All	All	13415	0	13010	245	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

All (245) 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:206:MET:HE3	2:B:604:SER:HA	1.59	0.82
2:B:949:PHE:HD1	2:B:950:ASP:H	1.34	0.76
2:C:958:TRP:HA	2:C:961:ASN:HB2	1.68	0.75
2:C:481:ILE:O	2:C:485:ILE:HD12	1.88	0.74
1:D:62:THR:HG23	1:D:219:LYS:HG2	1.69	0.74
2:C:949:PHE:HD1	2:C:950:ASP:H	1.34	0.74
2:B:958:TRP:HA	2:B:961:ASN:HB2	1.71	0.72
1:D:175:TYR:HB2	1:D:193:ILE:HB	1.70	0.71
2:B:481:ILE:O	2:B:485:ILE:HD12	1.88	0.71
1:A:175:TYR:HB2	1:A:193:ILE:HB	1.74	0.70
2:B:934:ILE:HG22	2:B:936:MET:H	1.59	0.68
1:A:16:LYS:HG3	1:A:172:GLU:HG3	1.75	0.68
2:C:704:MET:HB3	1:D:162:ILE:H	1.59	0.68
1:A:5:ILE:HG22	1:A:7:ASP:H	1.60	0.66
2:C:987:ARG:NH2	2:B:630:ASP:OD1	2.28	0.66
2:B:467:ASN:OD1	2:B:467:ASN:N	2.28	0.66
2:B:469:CYS:HB2	2:B:539:TYR:HE1	1.62	0.65
2:C:469:CYS:HB2	2:C:539:TYR:HE1	1.60	0.65
2:B:327:LYS:HA	2:B:330:LEU:HD12	1.79	0.65
2:C:705:ASN:HB3	2:C:708:PHE:HB3	1.79	0.64
2:B:696:THR:O	2:B:700:SER:HB2	1.97	0.64
2:C:467:ASN:OD1	2:C:467:ASN:N	2.32	0.63
2:C:554:ASP:OD1	2:C:554:ASP:N	2.31	0.62
2:C:311:TYR:HE1	2:C:315:LYS:HZ2	1.47	0.62
2:C:326:ARG:HB2	2:C:329:ASP:HB2	1.82	0.62
1:A:12:TYR:HD2	1:A:24:THR:HG22	1.63	0.61
2:B:326:ARG:HB2	2:B:329:ASP:HB2	1.82	0.61
2:C:684:ILE:HG21	2:C:726:VAL:HG21	1.81	0.61
1:A:17:SER:O	1:A:18:ASP:HB2	2.00	0.61
2:C:840:LYS:NZ	2:C:867:ASN:OD1	2.25	0.61
2:B:955:ILE:O	2:B:959:LEU:HD22	2.00	0.61
2:C:429:SER:OG	2:C:435:ASP:OD1	2.18	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:429:SER:OG	2:B:435:ASP:OD1	2.18	0.61
2:B:511:PHE:O	2:B:515:ILE:HG23	2.00	0.61
2:B:684:ILE:HG21	2:B:726:VAL:HG21	1.81	0.61
2:B:705:ASN:HB3	2:B:708:PHE:HB3	1.83	0.60
2:C:697:LYS:NZ	2:C:698:GLN:OE1	2.32	0.60
2:C:327:LYS:HA	2:C:330:LEU:HD12	1.83	0.60
2:C:488:ALA:HA	1:D:204:PHE:HZ	1.67	0.60
2:B:835:ILE:HG22	2:B:857:LYS:HE2	1.84	0.60
2:C:657:ARG:HA	2:C:715:GLU:HG3	1.84	0.59
2:B:809:LYS:NZ	2:B:815:PHE:O	2.34	0.59
2:C:955:ILE:O	2:C:959:LEU:HD22	2.01	0.59
2:B:802:ARG:HB3	2:B:840:LYS:HB3	1.84	0.59
2:C:511:PHE:O	2:C:515:ILE:HG23	2.03	0.58
1:D:225:ASP:OD2	1:D:228:THR:OG1	2.19	0.58
1:A:12:TYR:CD2	1:A:24:THR:HG22	2.39	0.57
2:C:317:SER:HA	2:C:320:PHE:HE2	1.69	0.57
1:A:15:ARG:HH12	1:A:20:LYS:HD3	1.69	0.57
2:C:802:ARG:HB3	2:C:840:LYS:HB3	1.86	0.57
2:C:809:LYS:NZ	2:C:815:PHE:O	2.37	0.56
2:B:512:LEU:O	2:B:516:GLU:HG2	2.05	0.56
2:B:657:ARG:HA	2:B:715:GLU:HG3	1.87	0.56
2:C:988:VAL:HG11	2:C:1000:LEU:HD12	1.87	0.56
2:C:471:TYR:O	2:C:475:GLN:HG3	2.06	0.55
1:D:16:LYS:HB2	1:D:170:ARG:HB2	1.87	0.55
2:C:709:TYR:OH	2:C:748:ASP:OD2	2.20	0.55
2:C:835:ILE:HG22	2:C:857:LYS:HE2	1.88	0.55
2:C:512:LEU:O	2:C:516:GLU:HG2	2.06	0.55
2:C:469:CYS:HB2	2:C:539:TYR:CE1	2.42	0.55
1:A:201:SER:O	1:A:201:SER:OG	2.24	0.54
2:C:934:ILE:HD11	2:C:944:VAL:HG11	1.89	0.54
2:B:469:CYS:HB2	2:B:539:TYR:CE1	2.42	0.54
1:A:55:SER:OG	1:A:57:LYS:NZ	2.38	0.54
1:A:16:LYS:O	1:A:17:SER:C	2.50	0.54
2:B:446:GLY:HA3	2:B:708:PHE:HB2	1.89	0.53
2:C:666:ASN:OD1	2:C:669:ARG:NH1	2.41	0.53
2:B:471:TYR:O	2:B:475:GLN:HG3	2.08	0.53
1:A:235:ILE:HG13	2:B:904:ILE:HG23	1.90	0.53
2:C:893:LYS:HA	2:C:896:TYR:HB3	1.89	0.53
1:A:208:LEU:HD12	1:A:209:GLU:H	1.74	0.53
2:B:666:ASN:OD1	2:B:669:ARG:NH1	2.42	0.53
1:A:197:ASN:HB3	1:A:223:LEU:HB2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:373:LEU:HB3	2:C:377:GLN:HB2	1.91	0.52
2:C:604:SER:HA	1:D:206:MET:HE3	1.90	0.52
1:A:217:GLU:OE2	1:A:217:GLU:N	2.40	0.52
2:B:999:ILE:HG23	2:B:1003:TYR:HD2	1.74	0.52
1:D:173:VAL:HG23	1:D:198:VAL:HG21	1.93	0.51
2:B:373:LEU:HB3	2:B:377:GLN:HB2	1.92	0.51
2:C:509:ASP:N	2:C:509:ASP:OD1	2.42	0.51
2:B:861:ASN:ND2	2:B:864:ASP:OD2	2.43	0.51
2:B:893:LYS:HA	2:B:896:TYR:HB3	1.92	0.51
2:B:893:LYS:HD3	2:B:933:PHE:HB2	1.93	0.51
2:B:899:GLU:O	2:B:903:GLY:N	2.43	0.51
2:C:861:ASN:ND2	2:C:864:ASP:OD2	2.42	0.51
2:C:978:HIS:O	2:C:981:ILE:HG22	2.11	0.51
2:B:993:ASP:HB3	2:B:996:TYR:HD2	1.77	0.51
1:A:15:ARG:HD2	1:A:18:ASP:HB3	1.92	0.50
1:A:173:VAL:HG23	1:A:198:VAL:HG21	1.93	0.50
2:B:509:ASP:OD1	2:B:509:ASP:N	2.43	0.50
2:B:978:HIS:O	2:B:981:ILE:HG22	2.10	0.50
2:B:562:THR:HG23	2:B:618:LEU:HD13	1.94	0.50
2:B:707:VAL:O	2:B:711:GLN:HG2	2.11	0.50
2:C:993:ASP:HB3	2:C:996:TYR:HD2	1.77	0.49
2:B:995:ARG:O	2:B:999:ILE:HD12	2.12	0.49
2:B:842:LEU:HD13	2:B:853:LEU:HD12	1.93	0.49
2:C:414:TYR:OH	2:C:654:ASN:OD1	2.27	0.49
2:B:357:MET:N	2:B:357:MET:SD	2.85	0.49
2:C:724:LYS:HB2	2:C:760:ARG:HG3	1.95	0.49
2:C:562:THR:HG23	2:C:618:LEU:HD13	1.95	0.49
1:D:25:ALA:HB2	1:D:66:ALA:HB2	1.95	0.48
1:A:170:ARG:NH1	1:A:197:ASN:OD1	2.47	0.48
2:B:318:PRO:HB3	2:B:539:TYR:CE2	2.48	0.48
2:C:842:LEU:HD13	2:C:853:LEU:HD12	1.96	0.48
2:B:414:TYR:OH	2:B:654:ASN:OD1	2.27	0.48
2:C:634:LEU:O	2:C:638:PHE:HD2	1.96	0.48
2:C:802:ARG:HG2	2:C:840:LYS:HE2	1.94	0.48
2:C:446:GLY:HA3	2:C:708:PHE:HB2	1.96	0.48
2:C:304:LYS:HE2	2:C:306:ASP:HB2	1.95	0.48
2:C:813:LYS:H	2:C:813:LYS:HD2	1.79	0.48
1:A:16:LYS:HG3	1:A:172:GLU:CG	2.44	0.48
2:B:304:LYS:HE2	2:B:306:ASP:HB2	1.96	0.48
2:B:311:TYR:HB3	2:B:356:TYR:CE1	2.49	0.48
2:B:883:GLU:O	2:B:887:GLU:HG2	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:921:PHE:HB2	2:C:943:PHE:HD2	1.79	0.48
2:B:852:HIS:HE1	2:B:856:PHE:HE2	1.63	0.47
2:B:940:TYR:CD1	2:B:944:VAL:HG23	2.49	0.47
2:C:902:LYS:HG3	2:C:904:ILE:HG13	1.95	0.47
2:C:432:ILE:HD13	2:C:467:ASN:HD21	1.78	0.47
2:B:349:HIS:C	2:B:349:HIS:CD2	2.93	0.47
2:C:487:GLN:NE2	1:D:210:ASN:OD1	2.47	0.47
2:B:313:TYR:CD1	2:B:380:ARG:HG2	2.50	0.47
2:B:749:LEU:HD22	2:B:753:LYS:HB3	1.97	0.47
2:C:975:HIS:O	2:C:978:HIS:ND1	2.48	0.46
2:C:973:ASN:HB3	2:C:976:MET:SD	2.55	0.46
2:B:927:ASN:ND2	2:B:928:SER:H	2.14	0.46
2:C:683:LYS:HB3	2:C:683:LYS:HE2	1.76	0.46
2:B:802:ARG:HG2	2:B:840:LYS:HE2	1.98	0.46
2:C:850:LYS:O	2:C:854:LEU:HG	2.15	0.46
2:B:317:SER:HA	2:B:320:PHE:CE1	2.51	0.46
2:B:364:LYS:O	2:B:370:ARG:NH1	2.49	0.45
2:B:504:TYR:CZ	2:B:706:VAL:HB	2.50	0.45
2:B:973:ASN:HB3	2:B:976:MET:SD	2.56	0.45
2:B:975:HIS:O	2:B:978:HIS:ND1	2.47	0.45
2:C:981:ILE:HD12	2:C:981:ILE:HA	1.80	0.45
2:B:840:LYS:HZ1	2:B:867:ASN:CG	2.16	0.45
2:C:478:ARG:HA	2:C:481:ILE:HG22	1.99	0.45
2:B:318:PRO:HB3	2:B:539:TYR:HE2	1.82	0.45
2:C:504:TYR:CZ	2:C:706:VAL:HB	2.52	0.45
2:C:326:ARG:HE	2:C:329:ASP:HB2	1.82	0.45
2:C:318:PRO:HB3	2:C:539:TYR:HE2	1.81	0.45
2:C:687:TYR:OH	2:C:715:GLU:OE2	2.33	0.45
2:B:538:LYS:HA	2:B:538:LYS:HD3	1.72	0.45
2:B:724:LYS:HB2	2:B:760:ARG:HD3	1.98	0.45
2:B:902:LYS:HG3	2:B:904:ILE:HG13	1.99	0.45
2:C:605:PHE:CE2	1:D:208:LEU:HB2	2.51	0.45
2:C:749:LEU:HD22	2:C:753:LYS:HB3	1.99	0.45
2:B:958:TRP:CD1	2:B:961:ASN:HD22	2.34	0.45
2:C:954:PHE:HB3	2:C:958:TRP:CE2	2.52	0.44
2:B:478:ARG:HA	2:B:481:ILE:HG22	1.99	0.44
2:B:557:LYS:HD3	2:B:557:LYS:HA	1.79	0.44
2:C:349:HIS:CD2	2:C:349:HIS:C	2.95	0.44
2:C:842:LEU:HD21	2:C:854:LEU:HD11	1.99	0.44
2:C:904:ILE:HG23	1:D:235:ILE:HG13	1.99	0.44
2:C:313:TYR:CD2	2:C:380:ARG:HG2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:822:GLU:OE2	2:C:822:GLU:N	2.50	0.44
2:C:318:PRO:HB3	2:C:539:TYR:CE2	2.53	0.44
2:C:779:LEU:HD22	2:C:841:LEU:HD11	2.00	0.44
2:B:326:ARG:HE	2:B:329:ASP:HB2	1.83	0.44
2:C:965:LYS:HE2	2:C:965:LYS:HB3	1.76	0.44
1:D:217:GLU:OE1	1:D:217:GLU:HA	2.18	0.43
2:C:442:LEU:HD23	2:C:442:LEU:HA	1.88	0.43
2:C:812:GLU:HG3	2:C:815:PHE:HB2	2.00	0.43
2:C:506:PRO:HG2	2:C:507:PHE:CD2	2.53	0.43
2:C:769:LYS:HB2	2:C:769:LYS:HE3	1.74	0.43
2:B:852:HIS:C	2:B:852:HIS:HD1	2.26	0.43
2:B:779:LEU:HD22	2:B:841:LEU:HD11	2.00	0.43
2:B:531:MET:HE3	2:B:531:MET:HB3	1.79	0.43
2:B:955:ILE:N	2:B:956:PRO:HD2	2.33	0.43
2:C:697:LYS:HE3	2:C:697:LYS:HB3	1.80	0.43
2:C:955:ILE:N	2:C:956:PRO:HD2	2.33	0.43
2:B:954:PHE:HB3	2:B:958:TRP:CE2	2.54	0.43
2:C:309:ILE:HA	2:C:312:ILE:HG12	2.01	0.43
2:B:852:HIS:O	2:B:855:SER:OG	2.27	0.43
2:B:485:ILE:O	2:B:489:VAL:HG22	2.19	0.42
2:C:359:ARG:HA	2:C:359:ARG:HD2	1.86	0.42
2:C:488:ALA:HA	1:D:204:PHE:CZ	2.51	0.42
2:C:557:LYS:HA	2:C:557:LYS:HD3	1.79	0.42
2:C:994:LYS:HE3	2:C:994:LYS:HB2	1.83	0.42
2:B:869:ILE:HD12	2:B:874:ILE:HB	2.01	0.42
2:C:563:ASN:HD21	2:B:614:ASN:HD21	1.67	0.42
2:C:1001:MET:HE2	2:C:1001:MET:HA	2.00	0.42
2:B:313:TYR:CE2	2:B:317:SER:HB3	2.55	0.42
2:B:504:TYR:CE2	2:B:706:VAL:HB	2.55	0.42
1:A:5:ILE:HG13	1:A:179:ALA:HB2	2.01	0.42
2:C:614:ASN:HD21	2:B:563:ASN:HD21	1.66	0.42
2:B:697:LYS:HE3	2:B:697:LYS:HB3	1.76	0.42
2:B:935:GLY:C	2:B:937:ASP:H	2.27	0.42
1:A:231:MET:H	2:B:909:SER:HB2	1.84	0.42
2:C:840:LYS:HE3	2:C:840:LYS:HA	2.01	0.42
2:B:930:MET:HE3	2:B:930:MET:HB3	1.78	0.42
2:B:978:HIS:O	2:B:982:GLU:HG2	2.20	0.42
1:A:22:VAL:HG12	1:A:23:PHE:HD2	1.84	0.42
2:B:341:GLU:HG2	2:B:345:THR:O	2.20	0.42
2:B:506:PRO:HG2	2:B:507:PHE:CD1	2.55	0.42
2:B:683:LYS:HE2	2:B:683:LYS:HB3	1.77	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:965:LYS:HE2	2:B:965:LYS:HB3	1.76	0.42
1:D:15:ARG:HD2	1:D:17:SER:HB2	2.02	0.42
2:B:456:SER:HA	2:B:478:ARG:HH11	1.85	0.42
2:B:994:LYS:HE3	2:B:994:LYS:HB2	1.83	0.42
2:B:1001:MET:HA	2:B:1001:MET:HE2	2.01	0.42
2:C:456:SER:HA	2:C:478:ARG:HH11	1.85	0.42
2:C:960:LYS:HB2	2:C:995:ARG:HG2	2.02	0.42
2:B:595:LEU:HD22	2:B:608:PHE:CE1	2.55	0.42
2:C:936:MET:HE2	2:C:936:MET:HB2	1.83	0.41
1:D:219:LYS:HB3	1:D:219:LYS:HE3	1.64	0.41
2:B:565:VAL:HG12	2:B:569:MET:HE2	2.01	0.41
2:B:822:GLU:N	2:B:822:GLU:OE2	2.52	0.41
1:A:206:MET:H	1:A:206:MET:HG3	1.53	0.41
2:C:460:LEU:HD23	2:C:460:LEU:HA	1.94	0.41
2:C:633:GLU:HG3	2:B:954:PHE:CD1	2.56	0.41
2:C:841:LEU:HD22	2:C:844:LEU:HD12	2.01	0.41
2:B:850:LYS:O	2:B:854:LEU:HG	2.21	0.41
1:A:33:SER:O	1:A:57:LYS:HA	2.20	0.41
2:B:717:LYS:HD2	2:B:757:TRP:CH2	2.56	0.41
2:C:978:HIS:O	2:C:982:GLU:HG2	2.20	0.41
2:B:867:ASN:O	2:B:871:ILE:HG12	2.21	0.41
2:B:896:TYR:O	2:B:899:GLU:HG2	2.21	0.41
2:C:595:LEU:HD22	2:C:608:PHE:CE1	2.55	0.41
2:C:717:LYS:HD2	2:C:757:TRP:CH2	2.56	0.41
2:C:770:SER:O	2:C:774:ILE:HG12	2.21	0.41
2:C:313:TYR:CE1	2:C:317:SER:HB3	2.55	0.41
2:C:482:TYR:CG	2:C:519:MET:HG3	2.55	0.41
2:B:442:LEU:HD23	2:B:442:LEU:HA	1.87	0.41
2:C:485:ILE:O	2:C:489:VAL:HG22	2.20	0.41
2:C:842:LEU:O	2:C:845:LEU:HD12	2.21	0.41
2:B:921:PHE:CD1	2:B:943:PHE:HD1	2.39	0.41
2:B:927:ASN:HD21	2:B:929:LYS:CE	2.33	0.41
2:B:931:GLU:HG2	2:B:944:VAL:HG13	2.02	0.41
2:B:938:ASP:HB2	2:B:953:LYS:HA	2.03	0.41
2:B:966:LEU:HD12	2:B:966:LEU:O	2.20	0.41
1:A:16:LYS:O	1:A:18:ASP:N	2.54	0.40
2:C:538:LYS:HA	2:C:538:LYS:HD3	1.75	0.40
2:C:705:ASN:O	2:C:709:TYR:N	2.50	0.40
2:B:697:LYS:NZ	2:B:698:GLN:OE1	2.44	0.40
2:B:770:SER:O	2:B:774:ILE:HG12	2.21	0.40
2:B:942:PHE:HB3	2:B:943:PHE:CD2	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:15:ARG:C	1:A:16:LYS:O	2.61	0.40
2:C:984:LEU:HD23	2:C:984:LEU:HA	1.92	0.40
2:B:842:LEU:HG	2:B:850:LYS:HG2	2.02	0.40
2:B:311:TYR:HB3	2:B:356:TYR:HE1	1.85	0.40
2:B:687:TYR:OH	2:B:715:GLU:OE2	2.36	0.40
2:B:951:TYR:CD1	2:B:951:TYR:C	2.99	0.40
2:C:812:GLU:HG3	2:C:812:GLU:O	2.21	0.40
2:B:359:ARG:HD2	2:B:359:ARG:HA	1.87	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	102/264 (39%)	93 (91%)	7 (7%)	2 (2%)	6 23
1	D	102/264 (39%)	92 (90%)	10 (10%)	0	100 100
2	B	694/1005 (69%)	654 (94%)	40 (6%)	0	100 100
2	C	691/1005 (69%)	651 (94%)	39 (6%)	1 (0%)	48 77
All	All	1589/2538 (63%)	1490 (94%)	96 (6%)	3 (0%)	45 73

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	18	ASP
1	A	17	SER
2	C	934	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	90/225 (40%)	82 (91%)	8 (9%)	8 26
1	D	95/225 (42%)	92 (97%)	3 (3%)	34 69
2	B	640/923 (69%)	621 (97%)	19 (3%)	36 71
2	C	636/923 (69%)	620 (98%)	16 (2%)	42 75
All	All	1461/2296 (64%)	1415 (97%)	46 (3%)	37 70

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	VAL
1	A	15	ARG
1	A	16	LYS
1	A	17	SER
1	A	29	THR
1	A	61	LEU
1	A	64	LYS
1	A	234	VAL
2	C	317	SER
2	C	465	GLU
2	C	467	ASN
2	C	476	ILE
2	C	525	ASP
2	C	527	LEU
2	C	554	ASP
2	C	567	SER
2	C	570	SER
2	C	603	VAL
2	C	643	SER
2	C	845	LEU
2	C	884	LEU
2	C	894	VAL
2	C	914	SER
2	C	1000	LEU

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Mol	Chain	Res	Type
1	D	10	ASP
1	D	18	ASP
1	D	61	LEU
2	B	317	SER
2	B	463	ILE
2	B	465	GLU
2	B	467	ASN
2	B	476	ILE
2	B	525	ASP
2	B	531	MET
2	B	554	ASP
2	B	570	SER
2	B	603	VAL
2	B	707	VAL
2	B	828	THR
2	B	884	LEU
2	B	886	ILE
2	B	894	VAL
2	B	914	SER
2	B	921	PHE
2	B	933	PHE
2	B	940	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	349	HIS
2	C	410	ASN
2	C	591	ASN
2	C	614	ASN
2	C	705	ASN
2	C	765	ASN
2	B	349	HIS
2	B	410	ASN
2	B	591	ASN
2	B	598	ASN
2	B	614	ASN
2	B	705	ASN
2	B	765	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

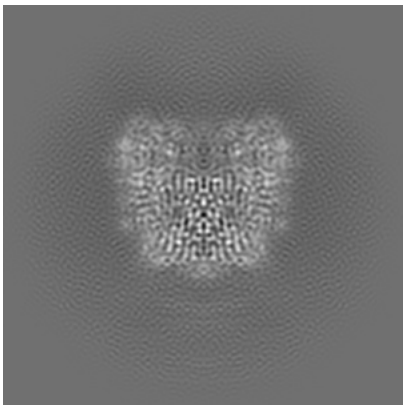
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-36980. These allow visual inspection of the internal detail of the map and identification of artifacts.

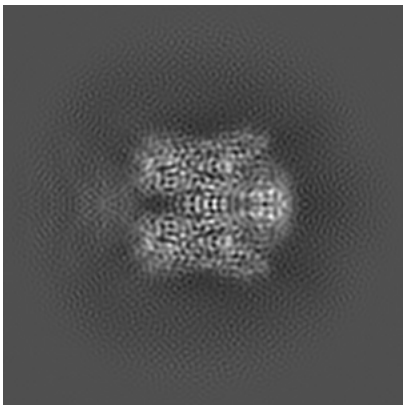
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

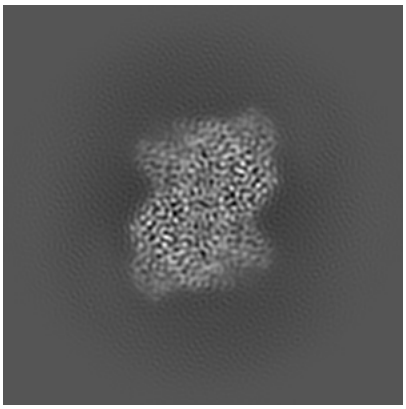
6.1.1 Primary map



X

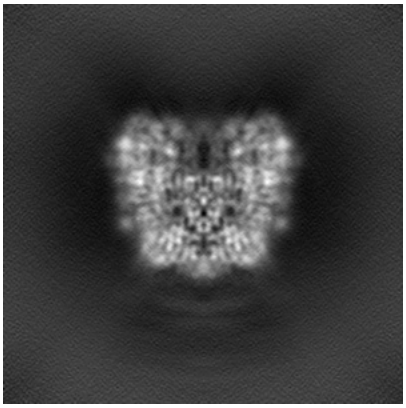


Y

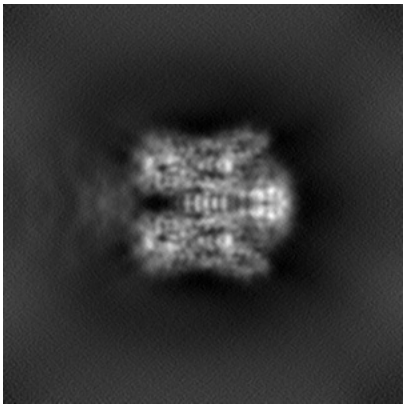


Z

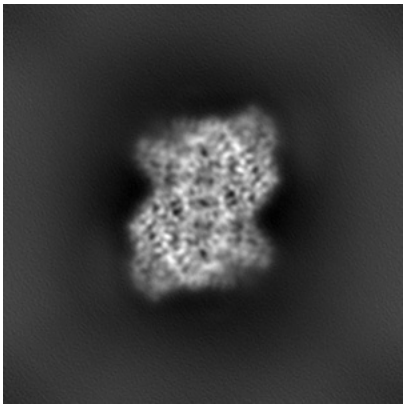
6.1.2 Raw map



X



Y

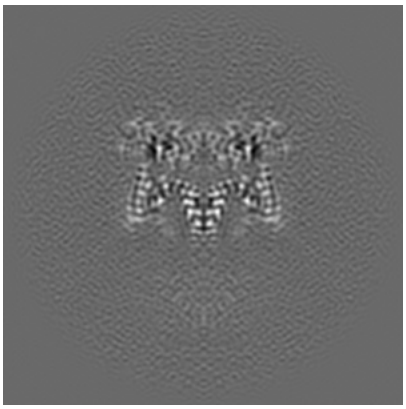


Z

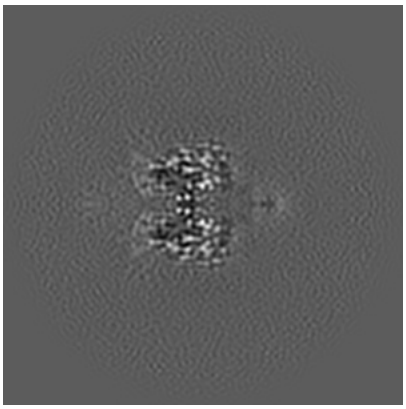
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

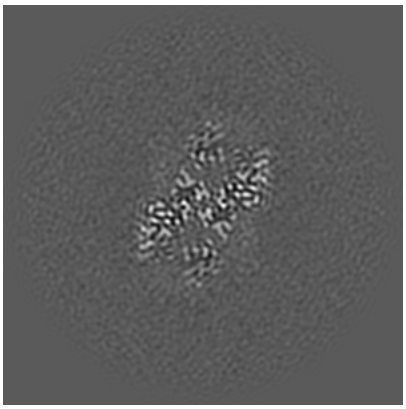
6.2.1 Primary map



X Index: 128

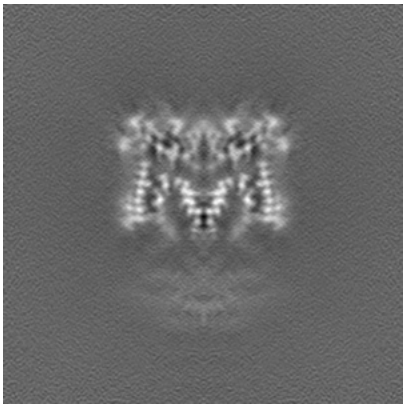


Y Index: 128

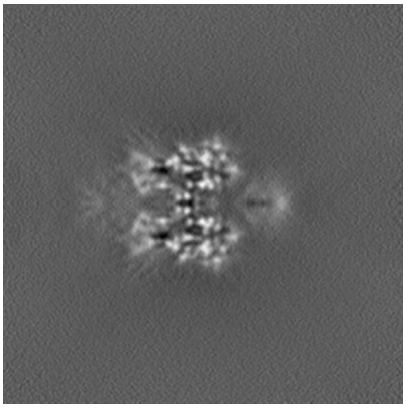


Z Index: 128

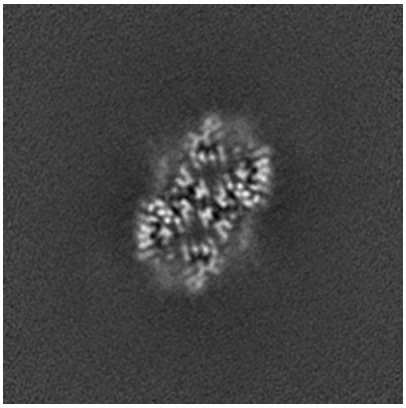
6.2.2 Raw map



X Index: 128



Y Index: 128

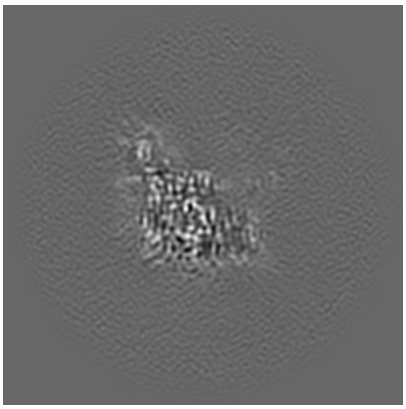


Z Index: 128

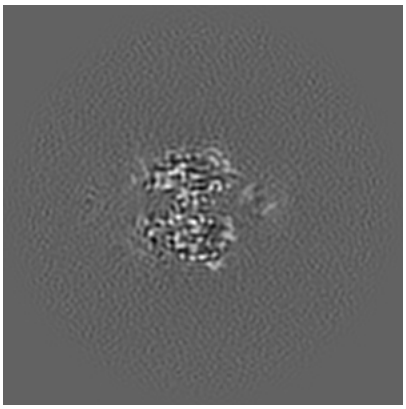
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

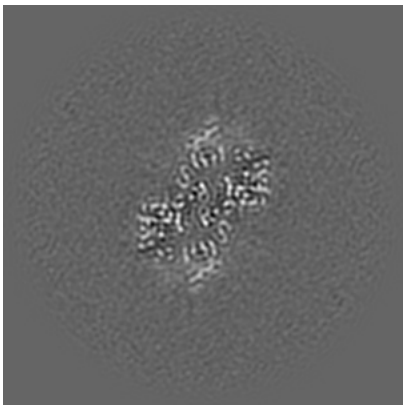
6.3.1 Primary map



X Index: 106

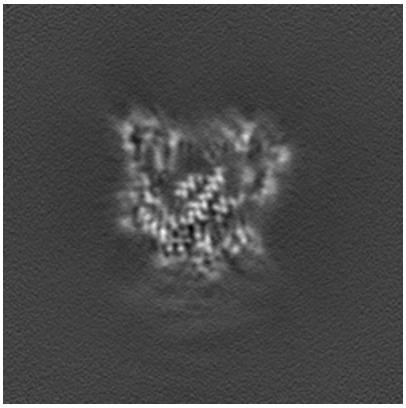


Y Index: 125

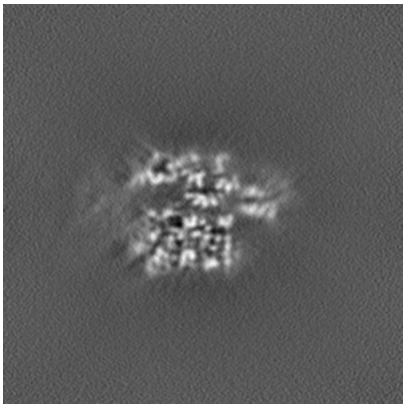


Z Index: 130

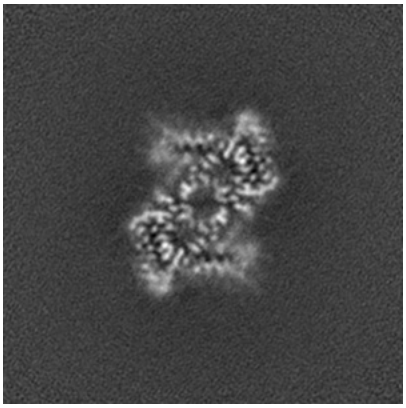
6.3.2 Raw map



X Index: 116



Y Index: 120

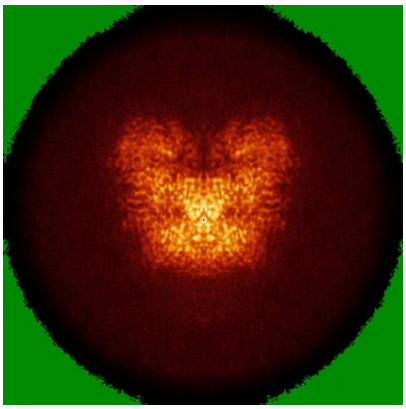


Z Index: 143

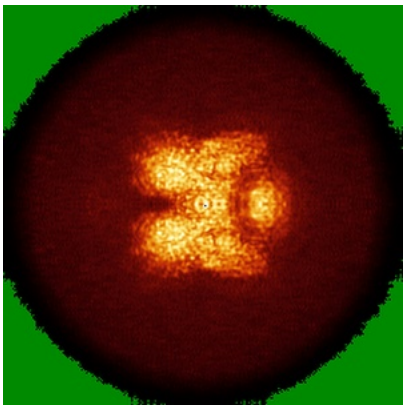
The images above show the largest variance slices of the map in three orthogonal directions.

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

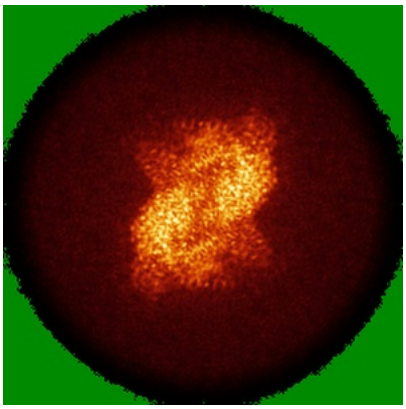
6.4.1 Primary map



X

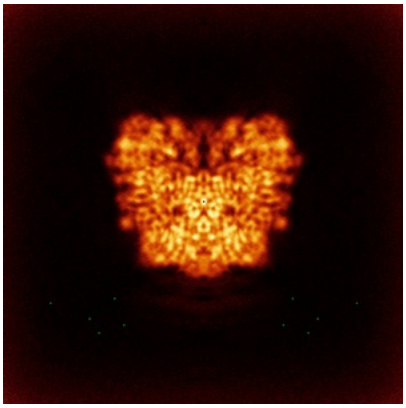


Y

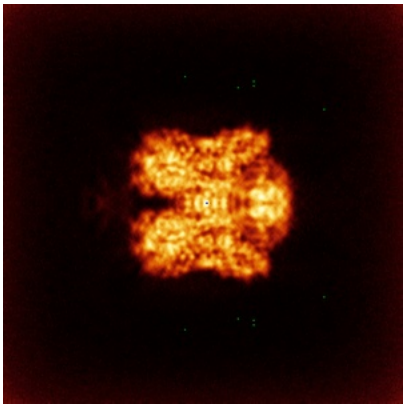


Z

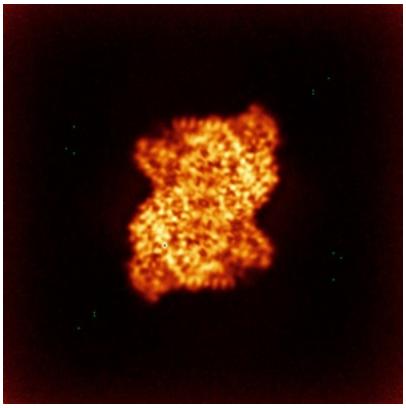
6.4.2 Raw map



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.

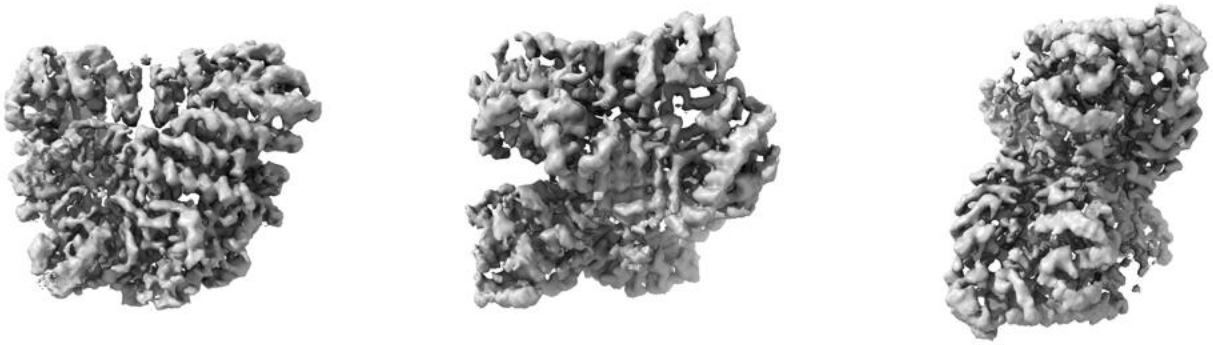
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.461. 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.

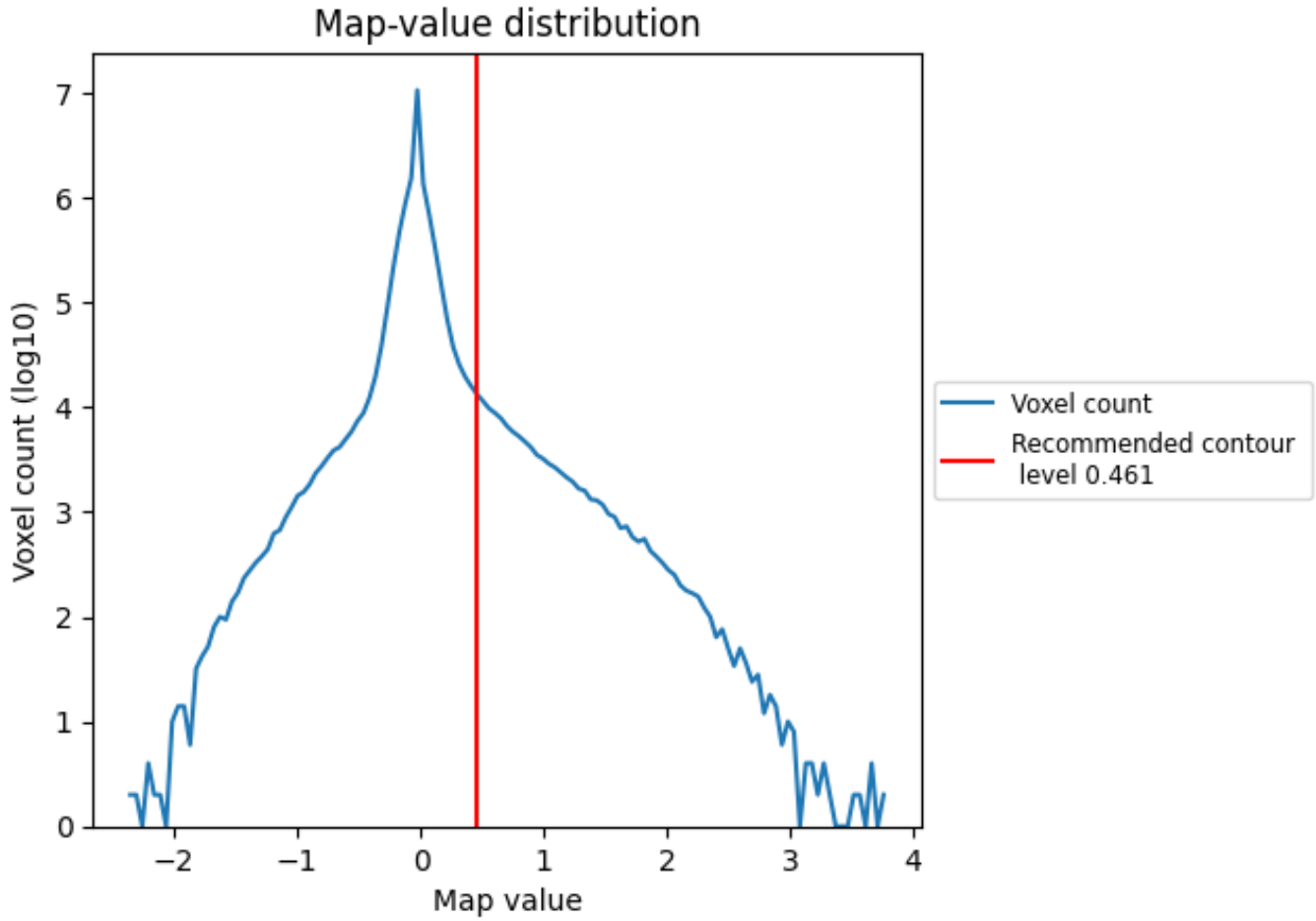
6.6 Mask visualisation (i)

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

7 Map analysis

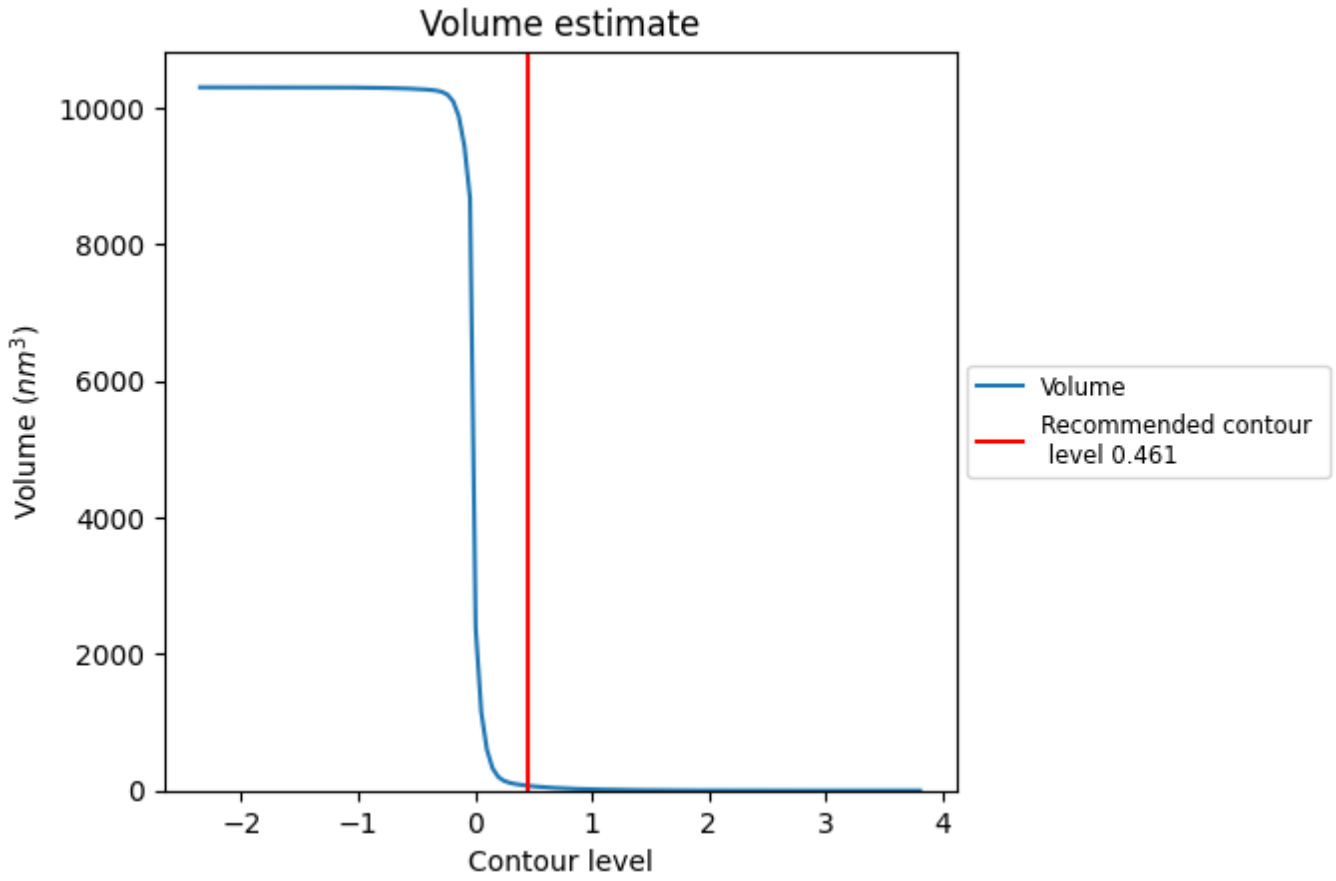
This section contains the results of statistical analysis of the map.

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.

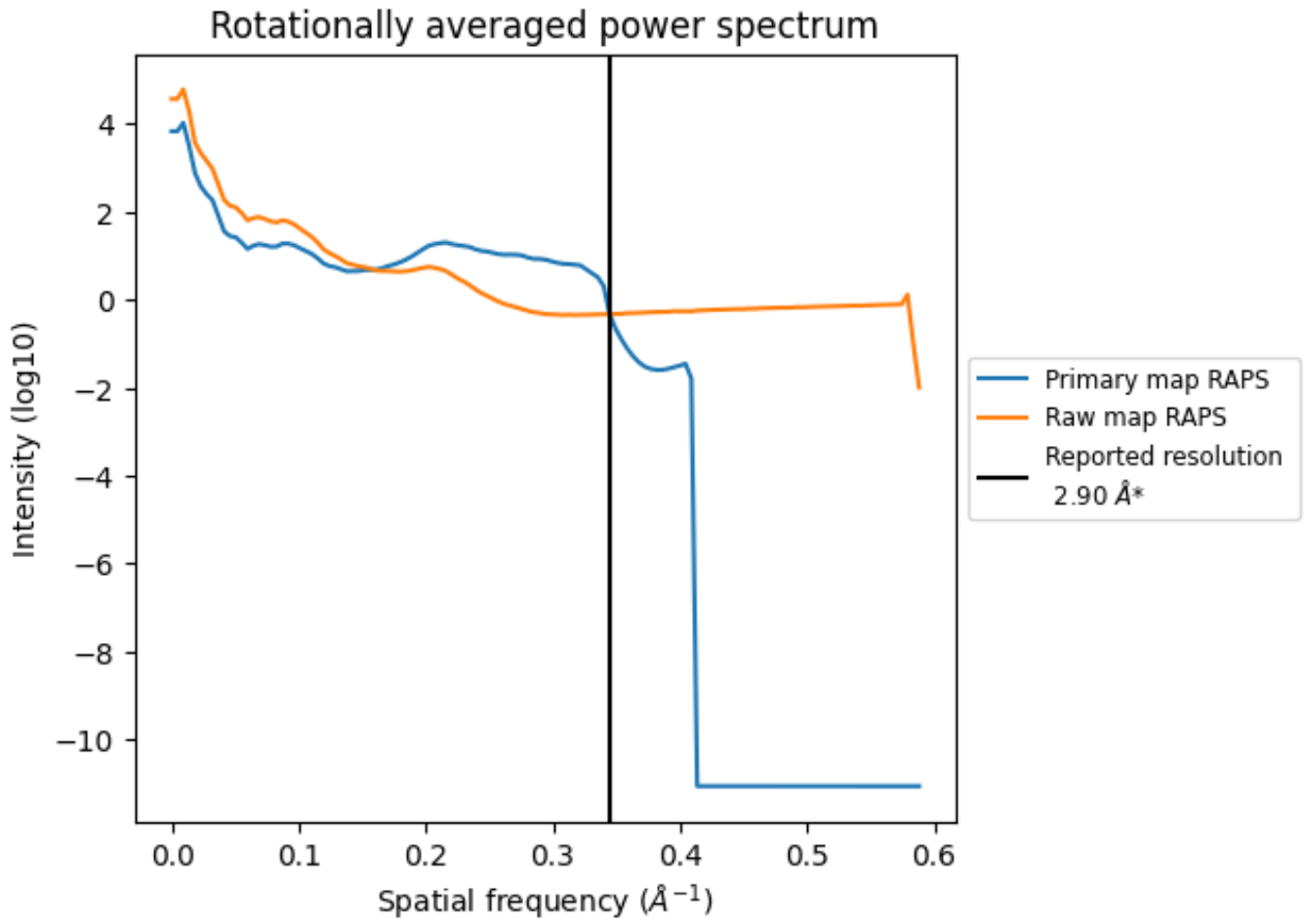
7.2 Volume estimate



The volume at the recommended contour level is 69 nm^3; this corresponds to an approximate mass of 62 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)

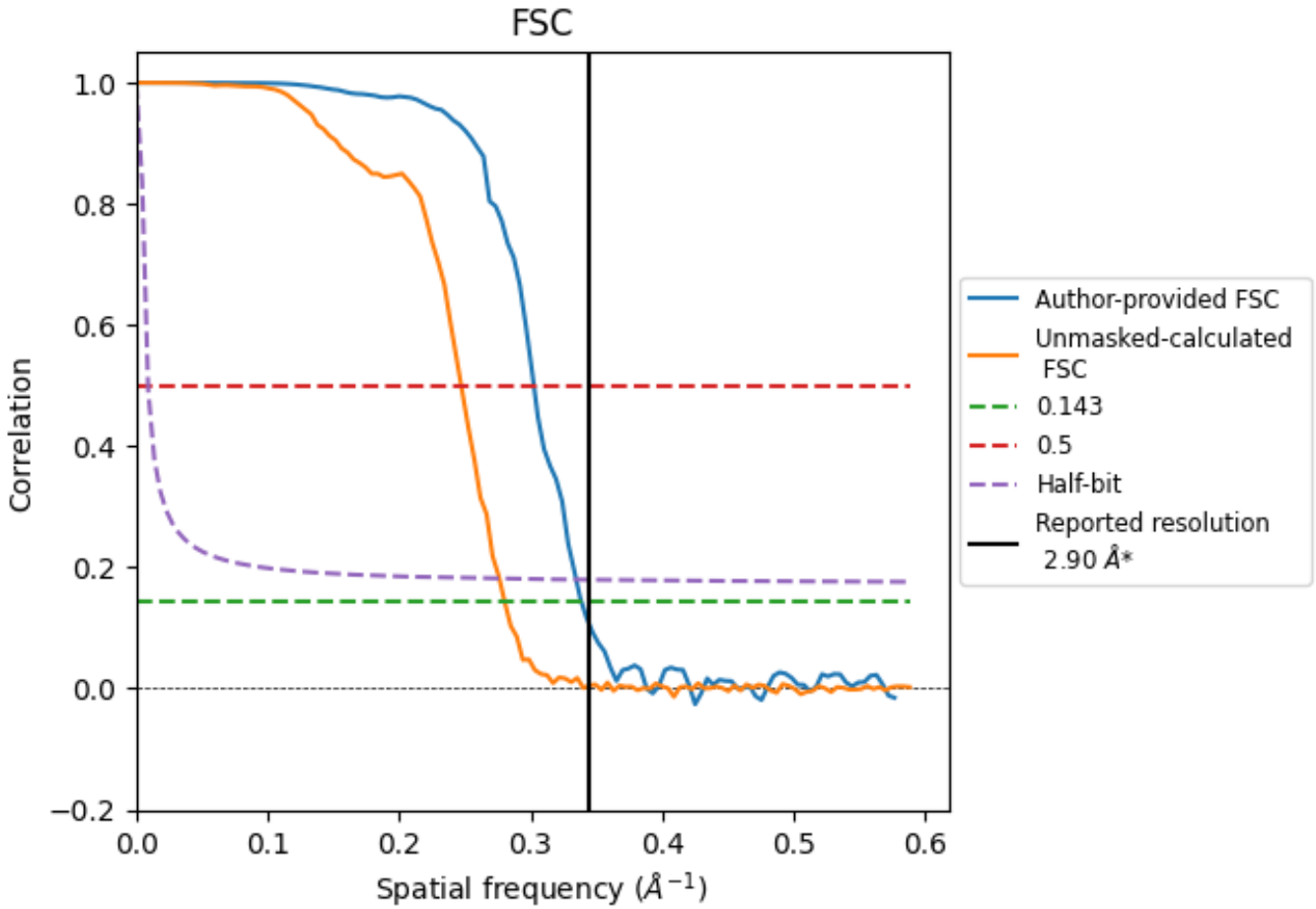


*Reported resolution corresponds to spatial frequency of 0.345 Å^{-1}

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 0.345 Å^{-1}

8.2 Resolution estimates (i)

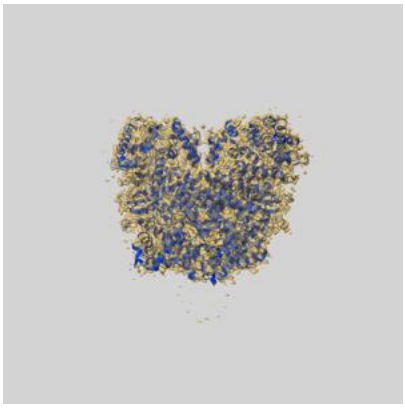
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.95	3.31	2.99
Unmasked-calculated*	3.57	4.05	3.62

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.57 differs from the reported value 2.9 by more than 10 %

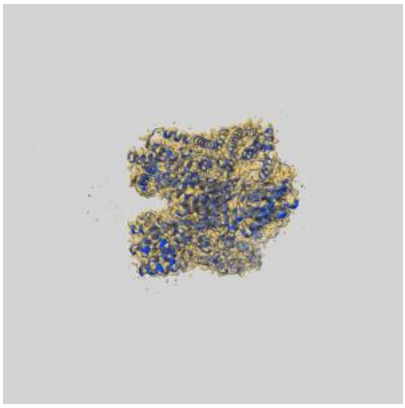
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-36980 and PDB model 8K98. Per-residue inclusion information can be found in section 3 on page 4.

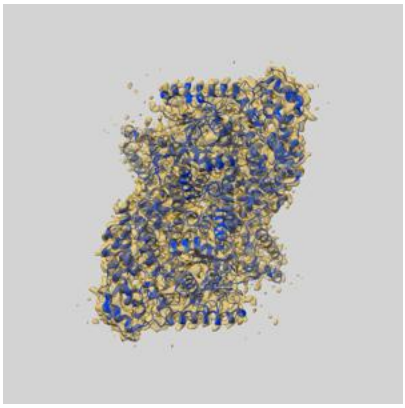
9.1 Map-model overlay



X



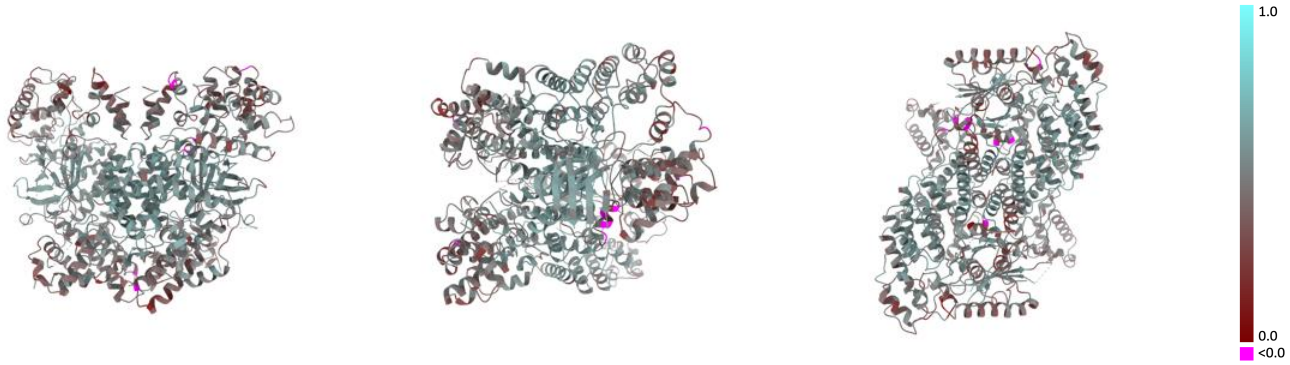
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.461 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.

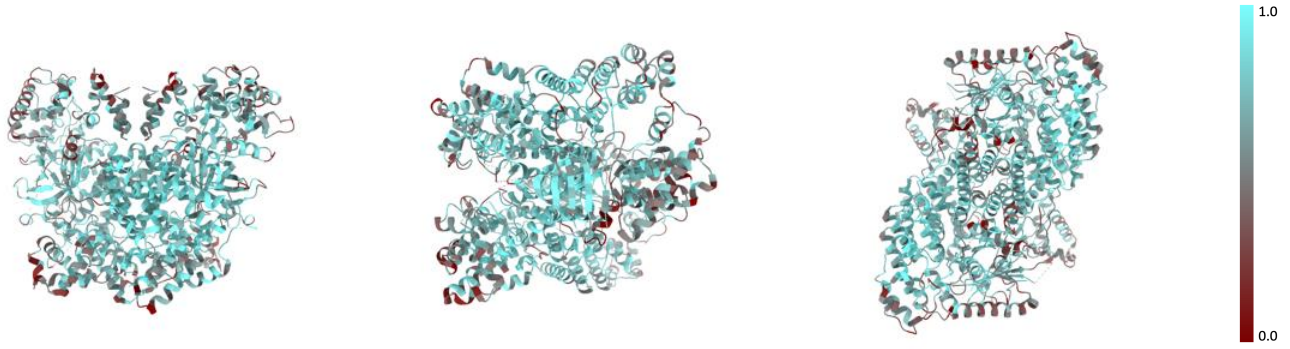
9.2 Q-score mapped to coordinate model



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.

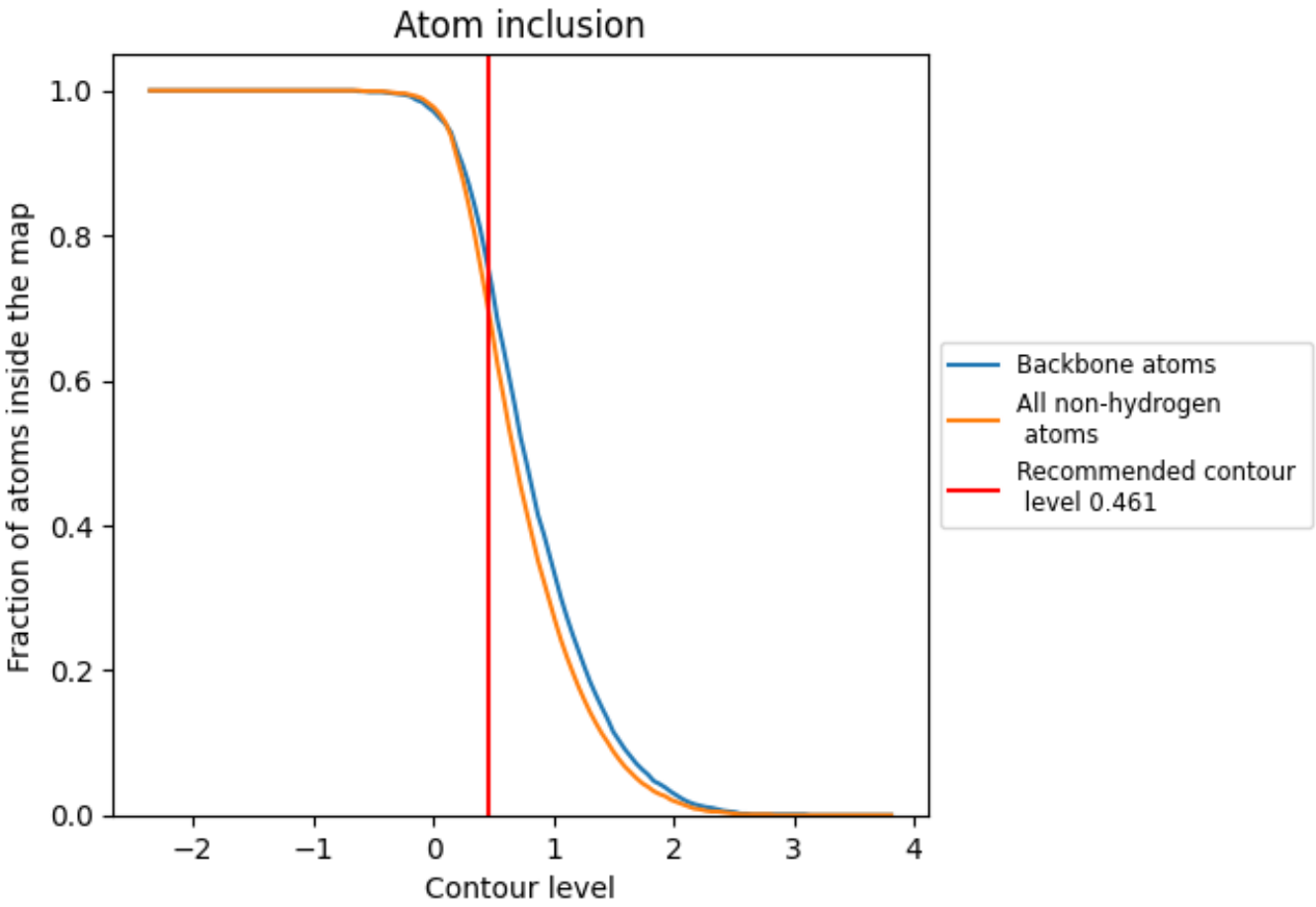
9.3 Atom inclusion mapped to coordinate model



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 (0.461).

9.4 Atom inclusion (i)



At the recommended contour level, 75% of all backbone atoms, 70% 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 (0.461) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6950	0.4860
A	0.7000	0.5270
B	0.6920	0.4770
C	0.6980	0.4830
D	0.6860	0.5200