WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Sep 17, 2024 – 04:13 PM JST

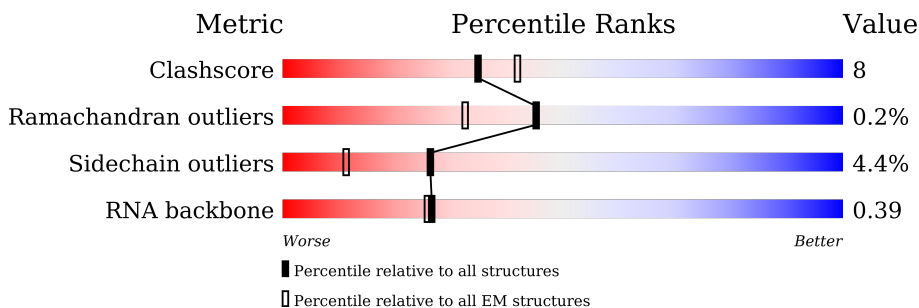|		
PDB ID	:	8KI7
EMDB ID	:	EMD-37253
Title	:	Structure of Tomato spotted wilt virus L protein contained endoH domain binding to 3'5'vRNA
Authors	:	Cao, L.; Wang, X.
Deposited on	:	2023-08-23
Resolution	:	3.70 Å(reported)

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 3.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Clashscore		8
Ramachandran outliers		0.2%
Sidechain outliers		4.4%
RNA backbone		0.39

Worse   *Better*

▌ Percentile relative to all structures
▯ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	2090	16% / 73% 21% • •
2	E	10	40% 40% 20%
3	B	9	22% / 67% 22% 11%
4	F	13	15% / 23% 62% 15%

2 Entity composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 16784 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 RNA-directed RNA polymerase L.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2003	Total 16102	C 10252	N 2678	O 3067	S 105	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	28	TYR	HIS	conflict	UNP A0A7G8JUQ9
A	1984	GLY	CYS	conflict	UNP A0A7G8JUQ9

- Molecule 2 is a RNA chain called RNA (5'-R(P*AP*GP*AP*GP*CP*AP*AP*UP*CP*A)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	10	Total 217	C 97	N 43	O 67	P 10	0	0

- Molecule 3 is a RNA chain called RNA (5'-R(P*GP*CP*AP*AP*UP*CP*AP*GP*G)-3').

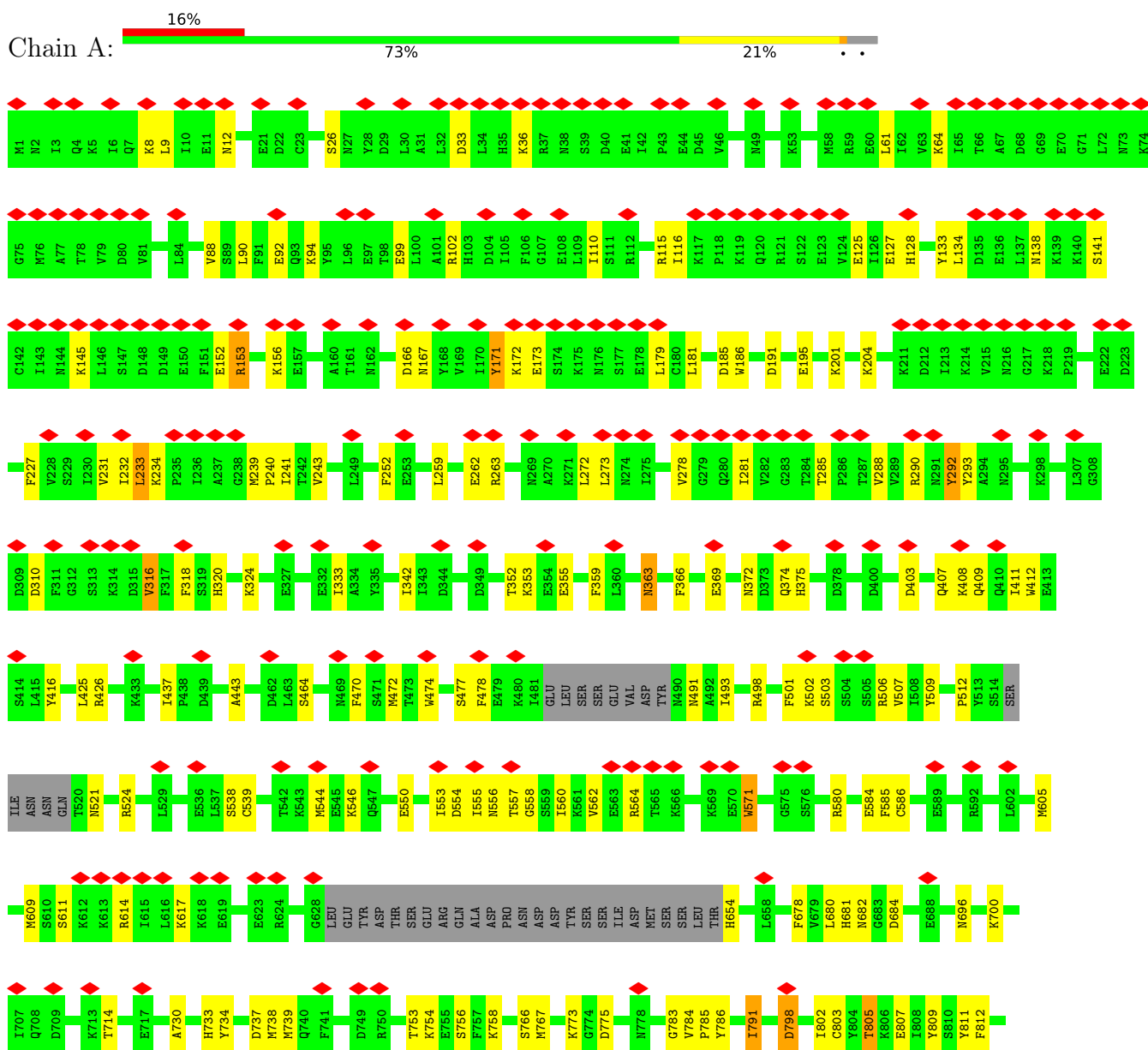| Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	9	Total 195	C 87	N 38	O 61	P 9	0	0

- Molecule 4 is a RNA chain called RNA (5'-R(P*AP*CP*CP*UP*GP*AP*UP*UP*GP*CP *UP*CP*U)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
4	F	13	Total 270	C 121	N 42	O 94	P 13	0	0

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.

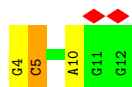• Molecule 1: RNA-directed RNA polymerase L
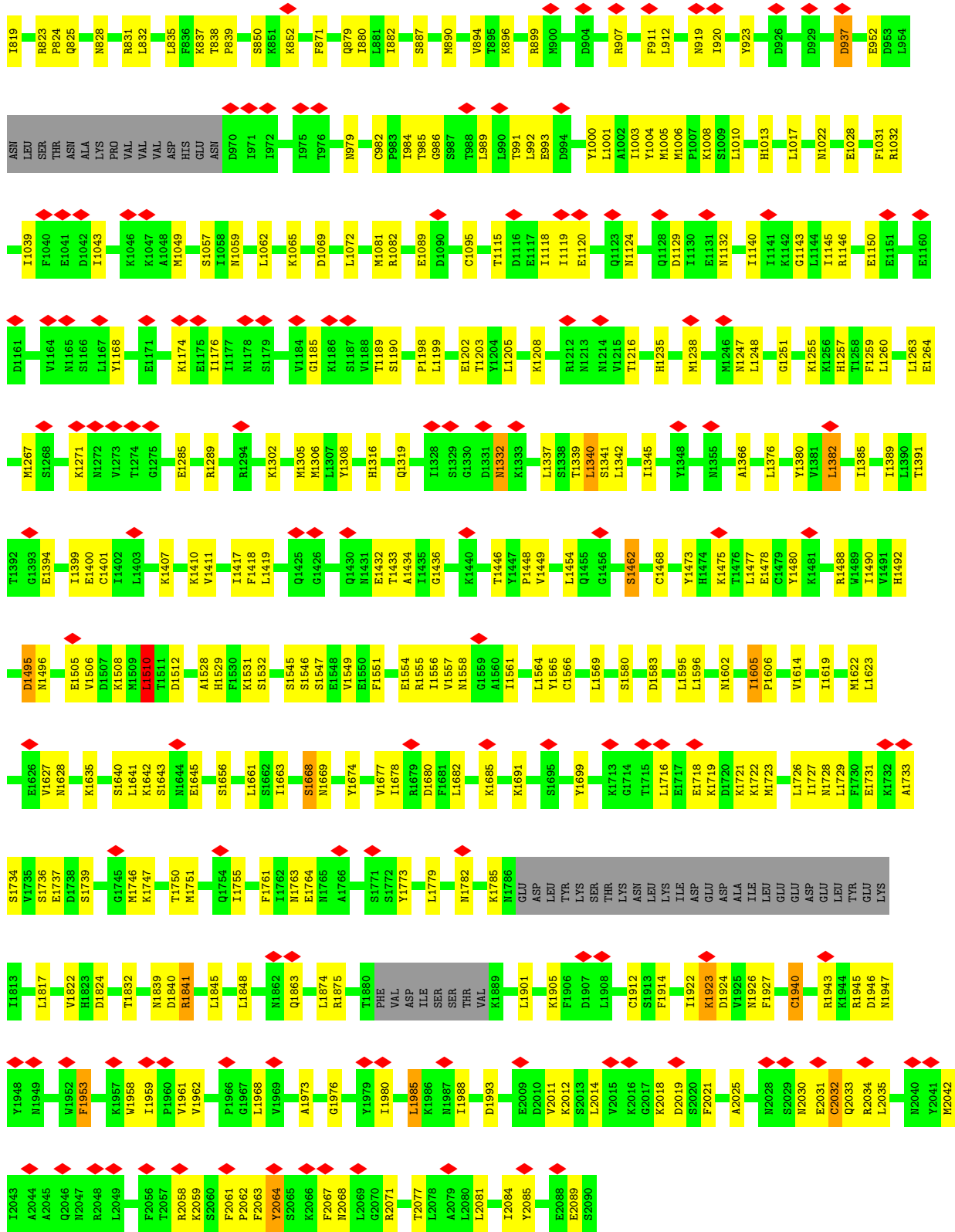
● Molecule 2: RNA (5'-R(P*AP*GP*AP*GP*CP*AP*AP*UP*CP*A)-3')

Chain E:

A1 G2 A3 A6 A7 U8 C9 A10

• Molecule 3: RNA (5'-R(P*GP*CP*AP*AP*UP*CP*AP*GP*G)-3')

Chain B:

22%

67% 22% 11%

G4 C5 A10 G11 G12

• Molecule 4: RNA (5'-R(P*AP*CP*CP*UP*GP*AP*UP*UP*GP*CP*UP*CP*U)-3')

Chain F:

15%

23% 62% 15%

A1 C2 C3 U4 G5 A6 U7 U8 G9 C10 U11 C12 U13

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	156980	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 $(e^-/\text{Å}^2)$	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	1.530	Depositor
Minimum map value	-0.943	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.064	Depositor
Recommended contour level	0.32	Depositor
Map size (Å)	228.79999, 228.79999, 228.79999	wwPDB
Map dimensions	220, 220, 220	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	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	0.30	0/16387	0.64	14/22066 (0.1%)
2	E	0.74	1/243 (0.4%)	1.08	3/375 (0.8%)
3	B	0.32	0/218	1.10	1/338 (0.3%)
4	F	0.32	0/299	1.31	5/462 (1.1%)
All	All	0.31	1/17147 (0.0%)	0.68	23/23241 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	1	A	OP3-P	-10.57	1.48	1.61

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1993	ASP	CB-CG-OD1	9.07	126.47	118.30
1	A	1583	ASP	CB-CG-OD1	9.06	126.46	118.30
1	A	791	ILE	CG1-CB-CG2	-7.93	93.94	111.40
1	A	992	LEU	CA-CB-CG	7.89	133.45	115.30
4	F	12	C	C2-N1-C1'	7.63	127.19	118.80
2	E	9	C	N1-C2-O2	7.32	123.29	118.90
4	F	12	C	N1-C2-O2	7.11	123.17	118.90
2	E	9	C	N3-C2-O2	-7.04	116.97	121.90
4	F	12	C	N3-C2-O2	-6.42	117.41	121.90
1	A	233	LEU	CA-CB-CG	6.17	129.48	115.30
4	F	12	C	C6-N1-C2	-6.12	117.85	120.30
1	A	2042	MET	CB-CG-SD	6.09	130.67	112.40
1	A	2042	MET	CA-CB-CG	6.00	123.50	113.30
1	A	1477	LEU	CA-CB-CG	5.82	128.69	115.30
2	E	9	C	C6-N1-C2	-5.74	118.00	120.30
1	A	1510	LEU	CA-CB-CG	5.61	128.21	115.30
1	A	1901	LEU	CA-CB-CG	5.58	128.14	115.30
1	A	1340	LEU	CA-CB-CG	5.30	127.50	115.30
1	A	2035	LEU	CA-CB-CG	5.11	127.05	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	F	7	U	C2-N1-C1'	5.09	123.81	117.70
3	B	5	C	N1-C2-O2	5.07	121.94	118.90
1	A	191	ASP	CB-CG-OD1	5.04	122.84	118.30
1	A	1382	LEU	CA-CB-CG	5.04	126.90	115.30

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	16102	0	16253	256	0
2	E	217	0	110	4	0
3	B	195	0	99	1	0
4	F	270	0	139	4	0
All	All	16784	0	16601	259	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 8.

All (259) 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:2059:LYS:O	1:A:2063:PHE:HB3	1.77	0.84
1:A:1342:LEU:HD23	1:A:1556:ILE:HG12	1.71	0.73
1:A:879:GLN:HA	1:A:882:ILE:HD12	1.76	0.68
1:A:1022:ASN:ND2	2:E:6:A:N7	2.41	0.68
1:A:1001:LEU:HB2	1:A:1566:CYS:HB2	1.75	0.66
1:A:1251:GLY:O	1:A:1839:ASN:ND2	2.29	0.65
1:A:1622:MET:HG2	1:A:1628:ASN:HB3	1.80	0.63
1:A:472:MET:SD	1:A:896:LYS:NZ	2.73	0.62
1:A:166:ASP:HB2	1:A:185:ASP:HA	1.82	0.62
1:A:558:GLY:HA3	1:A:1761:PHE:HA	1.82	0.61
1:A:773:LYS:NZ	3:B:4:G:N7	2.47	0.61
1:A:571:TRP:HE1	1:A:586:CYS:HG	1.45	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:259:LEU:HB2	1:A:262:GLU:HG3	1.82	0.61
1:A:115:ARG:HG2	1:A:272:LEU:HA	1.83	0.60
1:A:1120:GLU:O	1:A:1124:ASN:ND2	2.35	0.60
1:A:1946:ASP:N	1:A:1946:ASP:OD1	2.36	0.59
1:A:1150:GLU:OE1	1:A:1208:LYS:NZ	2.37	0.58
1:A:172:LYS:HD3	1:A:179:LEU:HD12	1.86	0.58
1:A:1640:SER:HB3	1:A:1721:LYS:HE3	1.86	0.58
1:A:831:ARG:NH2	1:A:1010:LEU:O	2.37	0.57
1:A:472:MET:O	1:A:786:TYR:OH	2.22	0.57
1:A:1605:ILE:HG13	1:A:1606:PRO:HD3	1.86	0.57
1:A:409:GLN:HA	1:A:412:TRP:HB2	1.86	0.57
1:A:1341:SER:HB2	1:A:1490:ILE:HD11	1.86	0.57
1:A:278:VAL:HG23	1:A:281:ILE:HD12	1.86	0.57
1:A:503:SER:OG	1:A:506:ARG:NH1	2.37	0.57
1:A:239:MET:HG2	1:A:290:ARG:HG2	1.86	0.56
1:A:141:SER:HA	1:A:145:LYS:HD2	1.86	0.56
1:A:1337:LEU:HA	1:A:1340:LEU:HG	1.87	0.56
1:A:472:MET:SD	1:A:472:MET:N	2.79	0.56
1:A:1947:ASN:ND2	1:A:2089:GLU:O	2.39	0.56
1:A:837:LYS:HE3	1:A:1619:ILE:HD11	1.88	0.56
1:A:1973:ALA:HA	1:A:2085:TYR:HA	1.87	0.56
1:A:26:SER:HB2	1:A:292:TYR:HB2	1.87	0.56
1:A:125:GLU:HG3	1:A:127:GLU:H	1.71	0.55
1:A:611:SER:HB3	4:F:3:C:H5'	1.89	0.55
1:A:1271:LYS:NZ	1:A:1400:GLU:OE2	2.36	0.55
1:A:1728:ASN:ND2	1:A:1905:LYS:O	2.39	0.55
1:A:991:THR:HG22	1:A:993:GLU:H	1.71	0.55
1:A:1082:ARG:NH2	1:A:1394:GLU:OE1	2.40	0.55
1:A:33:ASP:OD1	1:A:36:LYS:NZ	2.40	0.55
1:A:234:LYS:HB3	1:A:240:PRO:HD2	1.89	0.55
1:A:912:LEU:HD22	1:A:920:ILE:HG13	1.88	0.55
1:A:1433:THR:OG1	1:A:1434:ALA:N	2.40	0.54
1:A:478:PHE:HE2	1:A:767:MET:HG2	1.73	0.54
1:A:426:ARG:HH12	1:A:1532:SER:HB2	1.72	0.54
1:A:2032:CYS:SG	1:A:2064:TYR:OH	2.55	0.54
1:A:1475:LYS:HA	1:A:1478:GLU:HG2	1.88	0.54
1:A:1345:ILE:HG12	1:A:1488:ARG:HD2	1.89	0.54
1:A:919:ASN:HB2	1:A:923:TYR:HB2	1.90	0.54
1:A:355:GLU:OE1	1:A:412:TRP:NE1	2.42	0.53
1:A:498:ARG:NH2	1:A:539:CYS:O	2.42	0.53
1:A:696:ASN:O	1:A:700:LYS:HB2	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1736:SER:OG	1:A:1737:GLU:N	2.40	0.53
1:A:1959:ILE:HA	1:A:1962:VAL:HG12	1.90	0.53
1:A:1492:HIS:HB3	1:A:1495:ASP:HB2	1.91	0.53
1:A:2059:LYS:O	1:A:2063:PHE:CB	2.55	0.53
1:A:252:PHE:HZ	1:A:263:ARG:HH22	1.56	0.53
1:A:437:ILE:HG21	1:A:443:ALA:HB2	1.92	0.52
1:A:824:PRO:HG2	2:E:1:A:H1'	1.90	0.52
1:A:907:ARG:NH2	1:A:1004:TYR:OH	2.43	0.52
1:A:1556:ILE:HB	1:A:1561:ILE:HG12	1.91	0.52
1:A:1746:MET:H	1:A:1988:ILE:HD11	1.74	0.52
1:A:896:LYS:NZ	2:E:3:A:OP1	2.41	0.52
1:A:366:PHE:HB3	1:A:1072:LEU:HD21	1.91	0.52
1:A:890:MET:SD	1:A:899:ARG:NE	2.75	0.52
1:A:852:LYS:NZ	1:A:1565:TYR:OH	2.41	0.52
1:A:1140:ILE:HA	1:A:1203:THR:HG21	1.91	0.52
1:A:1988:ILE:HG22	1:A:2068:ASN:HD21	1.74	0.52
1:A:839:PRO:HB2	1:A:1614:VAL:HG11	1.92	0.51
1:A:320:HIS:O	1:A:1082:ARG:NH1	2.43	0.51
1:A:738:MET:HG3	1:A:838:THR:HG21	1.92	0.51
1:A:811:TYR:HA	1:A:819:ILE:O	2.10	0.51
1:A:560:ILE:HD12	1:A:1874:LEU:HG	1.91	0.51
1:A:1729:LEU:O	1:A:1733:ALA:HB2	2.10	0.51
1:A:1841:ARG:HD2	1:A:1845:LEU:HD21	1.92	0.51
1:A:1146:ARG:NH2	1:A:1150:GLU:OE2	2.44	0.51
1:A:1642:LYS:N	1:A:1645:GLU:OE2	2.43	0.51
1:A:1248:LEU:O	1:A:1255:LYS:NZ	2.41	0.51
1:A:99:GLU:HG3	1:A:102:ARG:HH12	1.76	0.51
1:A:9:LEU:HD22	1:A:88:VAL:HG22	1.93	0.50
1:A:1545:SER:OG	1:A:1546:SER:N	2.43	0.50
1:A:1656:SER:HB3	1:A:1661:LEU:HD22	1.93	0.50
1:A:1773:TYR:OH	1:A:1785:LYS:O	2.28	0.50
1:A:584:GLU:HB2	1:A:758:LYS:HG2	1.92	0.50
1:A:1832:THR:HG21	1:A:1845:LEU:HD11	1.93	0.50
1:A:1980:ILE:HG23	1:A:2077:THR:HA	1.94	0.50
1:A:426:ARG:NH1	1:A:1528:ALA:O	2.44	0.50
1:A:1146:ARG:NH1	1:A:1185:GLY:O	2.44	0.50
1:A:1761:PHE:O	1:A:1863:GLN:NE2	2.45	0.50
1:A:171:TYR:OH	1:A:173:GLU:OE1	2.29	0.50
1:A:609:MET:HB2	1:A:614:ARG:HH21	1.77	0.50
1:A:110:ILE:HD11	1:A:273:LEU:HD11	1.94	0.49
1:A:310:ASP:HA	1:A:318:PHE:HE2	1.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1000:TYR:HA	1:A:1003:ILE:HD12	1.94	0.49
1:A:828:ASN:H	1:A:831:ARG:HD2	1.77	0.49
1:A:937:ASP:OD1	1:A:937:ASP:N	2.40	0.49
1:A:2014:LEU:HD23	1:A:2025:ALA:HB2	1.92	0.49
1:A:1332:ASN:HD21	1:A:1976:GLY:HA3	1.77	0.49
1:A:1004:TYR:O	1:A:1289:ARG:NH1	2.46	0.49
1:A:1316:HIS:HA	1:A:1319:GLN:HB2	1.95	0.49
1:A:678:PHE:O	1:A:682:ASN:ND2	2.46	0.49
1:A:560:ILE:HD11	1:A:1875:ARG:HG2	1.94	0.49
1:A:1260:LEU:O	1:A:1264:GLU:HG3	2.12	0.48
1:A:1549:VAL:O	1:A:1555:ARG:HA	2.13	0.48
1:A:1656:SER:HG	1:A:1668:SER:HG	1.55	0.48
1:A:1235:HIS:NE2	1:A:1840:ASP:OD2	2.44	0.48
1:A:1569:LEU:HD13	1:A:1595:LEU:HD11	1.95	0.48
1:A:1095:CYS:HG	1:A:1257:HIS:HE2	1.56	0.48
1:A:1337:LEU:HD23	1:A:1490:ILE:HD12	1.94	0.48
1:A:556:ASN:HB3	1:A:1764:GLU:HG3	1.96	0.48
1:A:464:SER:HB2	1:A:512:PRO:HB2	1.96	0.47
1:A:195:GLU:HB2	1:A:232:ILE:HG13	1.96	0.47
1:A:1561:ILE:HG13	1:A:2084:ILE:HG21	1.96	0.47
1:A:911:PHE:HE1	1:A:1555:ARG:HH21	1.62	0.47
1:A:1547:SER:OG	1:A:1558:ASN:OD1	2.33	0.47
1:A:1663:ILE:HG13	1:A:1961:VAL:HG21	1.96	0.46
1:A:359:PHE:O	1:A:363:ASN:HB3	2.16	0.46
1:A:785:PRO:HA	1:A:825:GLN:O	2.15	0.46
1:A:1017:LEU:HB3	1:A:1417:ILE:HD13	1.97	0.46
1:A:1043:ILE:HG13	1:A:1407:LYS:HA	1.97	0.46
1:A:1366:ALA:HB3	1:A:1496:ASN:HB3	1.97	0.46
1:A:2032:CYS:HG	1:A:2064:TYR:HH	1.40	0.46
1:A:352:THR:OG1	1:A:353:LYS:N	2.48	0.46
1:A:403:ASP:O	1:A:407:GLN:NE2	2.49	0.46
1:A:1763:ASN:OD1	1:A:1763:ASN:N	2.48	0.46
4:F:8:U:H2'	4:F:9:G:H8	1.81	0.46
1:A:231:VAL:HB	1:A:243:VAL:HG22	1.98	0.46
1:A:1680:ASP:HB3	1:A:1719:LYS:HD2	1.95	0.46
1:A:775:ASP:HB3	1:A:783:GLY:H	1.81	0.46
1:A:1677:VAL:HG21	1:A:1726:LEU:HD12	1.97	0.46
1:A:571:TRP:NE1	1:A:586:CYS:SG	2.79	0.45
1:A:894:VAL:HG21	1:A:1006:MET:HG2	1.98	0.45
1:A:278:VAL:O	1:A:281:ILE:HB	2.16	0.45
1:A:832:LEU:HD23	1:A:835:LEU:HD12	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1473:TYR:HB2	1:A:1529:HIS:CD2	2.51	0.45
1:A:61:LEU:HD21	1:A:90:LEU:HD23	1.98	0.45
1:A:375:HIS:CD2	1:A:1391:THR:HB	2.51	0.45
1:A:1028:GLU:HG3	1:A:1449:VAL:HA	1.97	0.45
1:A:1432:GLU:HB3	1:A:1436:GLY:HA3	1.97	0.45
1:A:2011:VAL:O	1:A:2012:LYS:NZ	2.40	0.45
1:A:1492:HIS:HB2	1:A:1551:PHE:CZ	2.52	0.45
1:A:766:SER:HB3	1:A:791:ILE:HD12	1.99	0.45
1:A:8:LYS:O	1:A:12:ASN:ND2	2.43	0.45
1:A:498:ARG:NE	1:A:538:SER:OG	2.49	0.45
1:A:1926:ASN:OD1	1:A:1926:ASN:N	2.49	0.45
1:A:477:SER:OG	1:A:680:LEU:O	2.29	0.44
1:A:739:MET:HE1	1:A:1623:LEU:HD21	1.99	0.44
1:A:1049:MET:O	1:A:1057:SER:OG	2.34	0.44
1:A:1682:LEU:HD23	1:A:1699:TYR:HE2	1.82	0.44
1:A:2033:GLN:HB2	1:A:2034:ARG:HE	1.81	0.44
1:A:204:LYS:HA	1:A:204:LYS:HD2	1.70	0.44
1:A:1505:GLU:HG2	1:A:1508:LYS:HE2	1.98	0.44
1:A:617:LYS:HA	1:A:617:LYS:HD2	1.84	0.44
1:A:1750:THR:OG1	1:A:1751:MET:N	2.51	0.44
1:A:911:PHE:HB2	1:A:919:ASN:HD21	1.82	0.44
1:A:984:ILE:O	1:A:986:GLY:N	2.50	0.44
1:A:1691:LYS:HB3	1:A:1922:ILE:HD12	1.99	0.44
1:A:2030:ASN:OD1	1:A:2031:GLU:N	2.47	0.44
1:A:167:ASN:HD22	1:A:186:TRP:HH2	1.66	0.44
1:A:1385:ILE:HG12	1:A:1399:ILE:HD11	2.00	0.44
1:A:1782:ASN:HA	1:A:1785:LYS:HB2	2.00	0.44
1:A:233:LEU:HA	1:A:241:ILE:HA	1.99	0.44
1:A:408:LYS:HA	1:A:408:LYS:HD3	1.80	0.44
1:A:1259:PHE:HE1	1:A:1305:MET:HG2	1.81	0.44
1:A:1923:LYS:HZ1	1:A:1985:LEU:HD21	1.83	0.43
1:A:1926:ASN:HD22	1:A:1980:ILE:HG22	1.83	0.43
1:A:571:TRP:HA	1:A:580:ARG:HG2	2.01	0.43
1:A:1198:PRO:O	1:A:1202:GLU:HG3	2.18	0.43
1:A:553:ILE:HG23	1:A:555:ILE:H	1.83	0.43
1:A:798:ASP:O	1:A:802:ILE:HG12	2.17	0.43
1:A:1028:GLU:OE2	1:A:1032:ARG:NH2	2.49	0.43
1:A:824:PRO:HB2	2:E:1:A:N3	2.34	0.43
1:A:1380:TYR:HH	1:A:1462:SER:HG	1.64	0.43
1:A:1013:HIS:ND1	1:A:1285:GLU:OE2	2.46	0.43
1:A:1674:TYR:O	1:A:1678:ILE:HG12	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1682:LEU:HD11	1:A:1914:PHE:HZ	1.83	0.43
1:A:507:VAL:HA	1:A:812:PHE:HB3	2.00	0.43
1:A:807:GLU:HA	1:A:823:ARG:HD2	2.01	0.43
1:A:1028:GLU:HB2	1:A:1449:VAL:HG23	2.00	0.43
1:A:1723:MET:O	1:A:1727:ILE:HG12	2.18	0.43
1:A:153:ARG:HA	1:A:156:LYS:HB2	2.00	0.43
1:A:991:THR:HG22	1:A:993:GLU:HB3	2.01	0.43
1:A:1962:VAL:HG22	1:A:1968:LEU:HD13	2.01	0.43
1:A:2019:ASP:N	1:A:2019:ASP:OD1	2.50	0.43
4:F:8:U:H2'	4:F:9:G:C8	2.53	0.43
1:A:201:LYS:NZ	1:A:369:GLU:O	2.41	0.42
1:A:316:VAL:O	1:A:372:ASN:ND2	2.51	0.42
1:A:493:ILE:HD12	1:A:493:ILE:H	1.83	0.42
1:A:512:PRO:O	1:A:805:THR:OG1	2.30	0.42
1:A:546:LYS:HB2	1:A:546:LYS:HE2	1.85	0.42
1:A:1065:LYS:HA	1:A:1065:LYS:HD2	1.86	0.42
1:A:1924:ASP:HB3	1:A:1927:PHE:HB3	2.01	0.42
1:A:474:TRP:NE1	1:A:807:GLU:OE2	2.49	0.42
1:A:521:ASN:OD1	1:A:521:ASN:N	2.52	0.42
1:A:753:THR:OG1	1:A:754:LYS:N	2.52	0.42
1:A:880:ILE:HD13	1:A:880:ILE:HA	1.87	0.42
1:A:125:GLU:HB3	1:A:128:HIS:ND1	2.34	0.42
1:A:1189:THR:OG1	1:A:1190:SER:N	2.52	0.42
1:A:285:THR:HB	1:A:288:VAL:HB	2.01	0.42
1:A:1669:ASN:OD1	1:A:1669:ASN:N	2.52	0.42
1:A:509:TYR:CZ	1:A:524:ARG:HG2	2.54	0.42
1:A:554:ASP:HA	1:A:557:THR:HG22	2.01	0.42
1:A:1143:GLY:HA3	1:A:1203:THR:HG23	2.01	0.42
1:A:1678:ILE:HG23	1:A:1682:LEU:HD13	2.00	0.42
1:A:152:GLU:HB3	1:A:156:LYS:HE3	2.00	0.42
1:A:550:GLU:N	1:A:550:GLU:OE2	2.53	0.42
1:A:1001:LEU:O	1:A:1005:MET:HB3	2.20	0.42
1:A:1205:LEU:HD11	1:A:1418:PHE:HE2	1.85	0.42
1:A:1663:ILE:HD13	1:A:1663:ILE:HA	1.80	0.42
1:A:2018:LYS:HG2	1:A:2021:PHE:HD2	1.85	0.42
1:A:605:MET:SD	1:A:824:PRO:HB3	2.60	0.42
1:A:1008:LYS:HD3	1:A:1289:ARG:HH21	1.84	0.42
1:A:1302:LYS:H	1:A:1302:LYS:HG2	1.63	0.42
1:A:408:LYS:HA	1:A:411:ILE:HG22	2.01	0.42
1:A:1480:TYR:OH	1:A:1512:ASP:OD2	2.38	0.42
1:A:1988:ILE:HD13	1:A:1988:ILE:HA	1.90	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:94:LYS:HD3	1:A:94:LYS:HA	1.80	0.41
1:A:1641:LEU:HD23	1:A:1722:LYS:HG2	2.01	0.41
1:A:115:ARG:HG3	1:A:116:ILE:HG13	2.02	0.41
1:A:1081:MET:HG2	1:A:1389:ILE:HD11	2.01	0.41
1:A:1129:ASP:HB3	1:A:1132:ASN:HB3	2.01	0.41
1:A:1145:ILE:HD11	1:A:1176:ILE:HG23	2.01	0.41
1:A:730:ALA:HB1	1:A:733:HIS:HB2	2.02	0.41
1:A:1089:GLU:O	1:A:1308:TYR:OH	2.38	0.41
1:A:2081:LEU:HD23	1:A:2081:LEU:HA	1.89	0.41
1:A:979:ASN:HD21	1:A:989:LEU:HD22	1.85	0.41
1:A:1059:ASN:HB3	1:A:1062:LEU:HB3	2.02	0.41
1:A:1845:LEU:HA	1:A:1848:LEU:HG	2.03	0.41
1:A:92:GLU:OE1	1:A:310:ASP:HB3	2.20	0.41
1:A:1306:MET:HB3	1:A:1401:CYS:SG	2.61	0.41
1:A:1419:LEU:HD23	1:A:1419:LEU:HA	1.93	0.41
1:A:1017:LEU:HD12	1:A:1017:LEU:HA	1.86	0.41
1:A:1174:LYS:HA	1:A:1174:LYS:HD2	1.85	0.41
1:A:1032:ARG:HD2	1:A:1039:ILE:HD13	2.02	0.41
1:A:1554:GLU:HG2	1:A:1564:LEU:HB3	2.03	0.41
1:A:1602:ASN:HA	1:A:1953:PHE:CE2	2.55	0.41
1:A:1663:ILE:HD11	1:A:1958:TRP:HD1	1.85	0.41
1:A:1734:SER:O	1:A:1739:SER:OG	2.30	0.41
4:F:5:G:H2'	4:F:6:A:H8	1.85	0.41
1:A:133:TYR:CG	1:A:181:LEU:HD22	2.56	0.41
1:A:1263:LEU:O	1:A:1267:MET:HG2	2.21	0.41
1:A:134:LEU:O	1:A:138:ASN:ND2	2.54	0.40
1:A:1118:ILE:HG22	1:A:1119:ILE:HD13	2.04	0.40
1:A:1199:LEU:O	1:A:1203:THR:HG22	2.21	0.40
1:A:1410:LYS:HE3	1:A:1448:PRO:HG3	2.03	0.40
1:A:1642:LYS:HG2	1:A:1643:SER:H	1.86	0.40
1:A:1728:ASN:HA	1:A:1731:GLU:HG2	2.02	0.40
1:A:64:LYS:HD2	1:A:64:LYS:HA	1.88	0.40
1:A:730:ALA:O	1:A:734:TYR:HB3	2.22	0.40
1:A:1506:VAL:O	1:A:1510:LEU:HD22	2.22	0.40
1:A:1940:CYS:HB2	1:A:1945:ARG:HB3	2.03	0.40
1:A:2058:ARG:HB3	1:A:2062:PRO:HG3	2.02	0.40
1:A:416:TYR:HE2	1:A:1475:LYS:HE3	1.86	0.40
1:A:544:MET:N	1:A:544:MET:SD	2.94	0.40
1:A:1940:CYS:HB2	1:A:1945:ARG:HE	1.86	0.40
1:A:1943:ARG:HA	1:A:1943:ARG:HD2	1.93	0.40
1:A:1959:ILE:HA	1:A:1959:ILE:HD12	1.92	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2014:LEU:HD13	1:A:2014:LEU:HA	1.95	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	1989/2090 (95%)	1839 (92%)	146 (7%)	4 (0%)	44	72

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	316	VAL
1	A	985	THR
1	A	324	LYS
1	A	1755	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	1837/1932 (95%)	1757 (96%)	80 (4%)	24	50

All (80) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	153	ARG
1	A	171	TYR
1	A	227	PHE
1	A	292	TYR
1	A	293	TYR
1	A	333	ILE
1	A	342	ILE
1	A	363	ASN
1	A	374	GLN
1	A	425	LEU
1	A	470	PHE
1	A	491	ASN
1	A	501	PHE
1	A	502	LYS
1	A	562	VAL
1	A	564	ARG
1	A	571	TRP
1	A	585	PHE
1	A	654	HIS
1	A	681	HIS
1	A	684	ASP
1	A	714	THR
1	A	737	ASP
1	A	756	SER
1	A	784	VAL
1	A	798	ASP
1	A	803	CYS
1	A	805	THR
1	A	809	TYR
1	A	850	SER
1	A	871	PHE
1	A	887	SER
1	A	937	ASP
1	A	952	GLU
1	A	982	CYS
1	A	1031	PHE
1	A	1069	ASP
1	A	1115	THR
1	A	1168	TYR
1	A	1216	THR
1	A	1238	MET
1	A	1247	ASN
1	A	1332	ASN

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Mol	Chain	Res	Type
1	A	1339	THR
1	A	1376	LEU
1	A	1382	LEU
1	A	1411	VAL
1	A	1446	THR
1	A	1454	LEU
1	A	1462	SER
1	A	1468	CYS
1	A	1495	ASP
1	A	1510	LEU
1	A	1531	LYS
1	A	1557	VAL
1	A	1580	SER
1	A	1596	LEU
1	A	1605	ILE
1	A	1627	VAL
1	A	1635	LYS
1	A	1668	SER
1	A	1685	LYS
1	A	1716	LEU
1	A	1718	GLU
1	A	1747	LYS
1	A	1779	LEU
1	A	1817	LEU
1	A	1822	VAL
1	A	1824	ASP
1	A	1841	ARG
1	A	1912	CYS
1	A	1923	LYS
1	A	1940	CYS
1	A	1953	PHE
1	A	1985	LEU
1	A	2032	CYS
1	A	2061	PHE
1	A	2064	TYR
1	A	2067	PHE
1	A	2071	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1124	ASN

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Mol	Chain	Res	Type
1	A	1947	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	E	9/10 (90%)	3 (33%)	0
3	B	8/9 (88%)	2 (25%)	0
4	F	12/13 (92%)	5 (41%)	1 (8%)
All	All	29/32 (90%)	10 (34%)	1 (3%)

All (10) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	E	6	A
2	E	7	A
2	E	8	U
3	B	5	C
3	B	10	A
4	F	4	U
4	F	7	U
4	F	11	U
4	F	12	C
4	F	13	U

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
4	F	11	U

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 (i)

This section contains visualisations of the EMDB entry EMD-37253. 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 (i)

6.1.1 Primary map
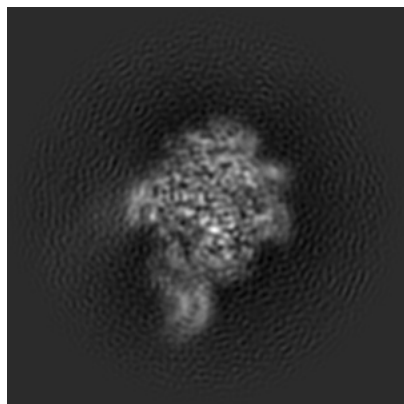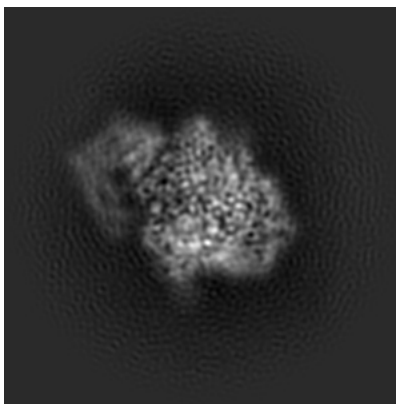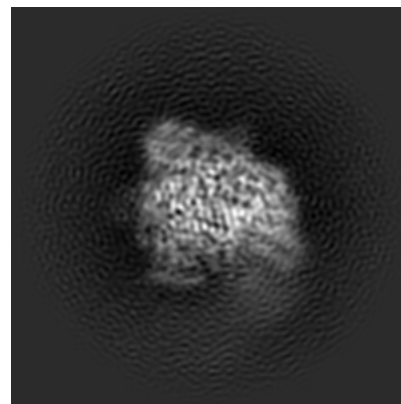
X   Y   Z

6.1.2 Raw map

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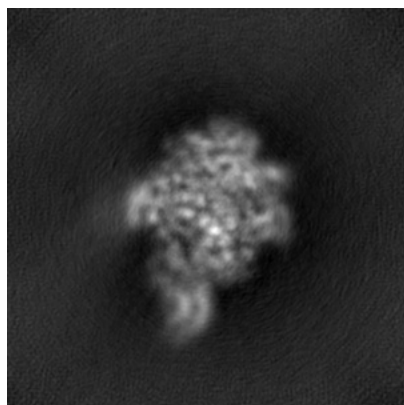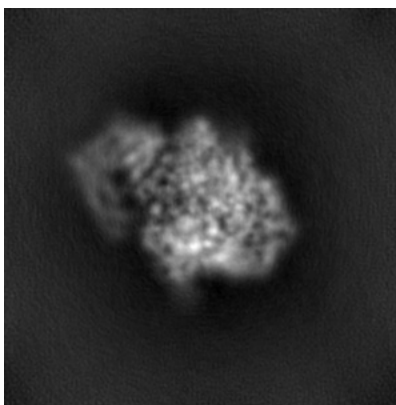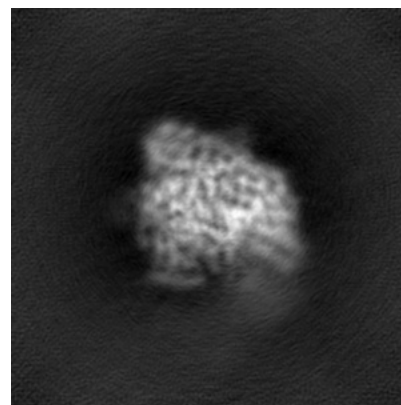
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
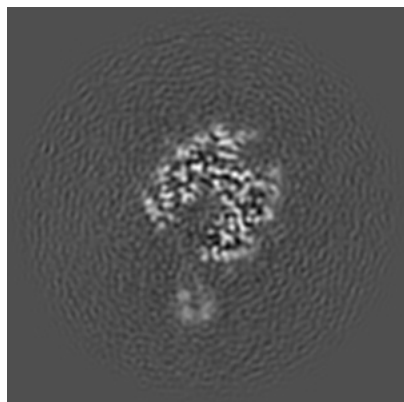
6.2.1   Primary map
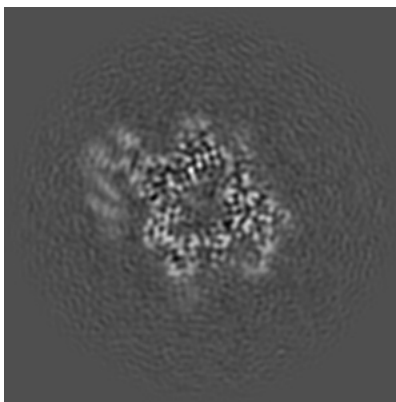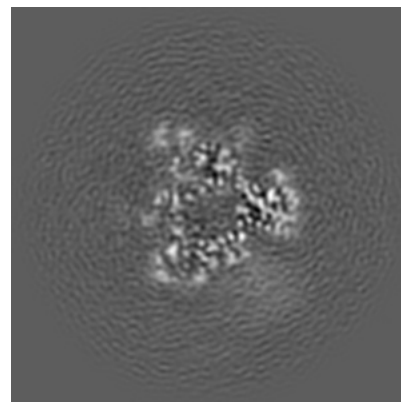
| X Index: 110 | Y Index: 110 | Z Index: 110 |

6.2.2   Raw map
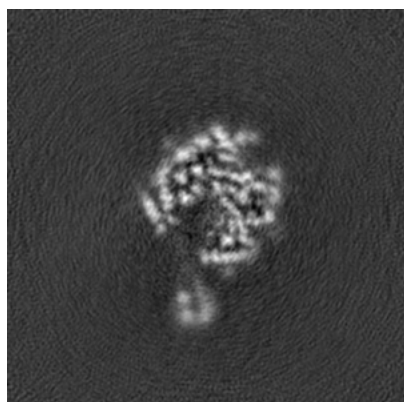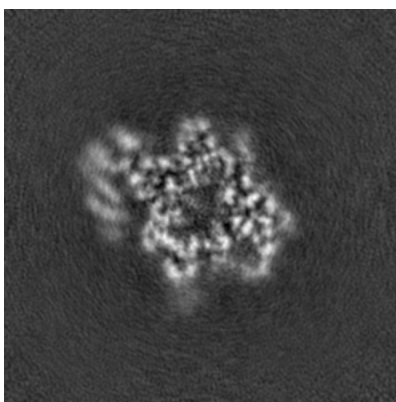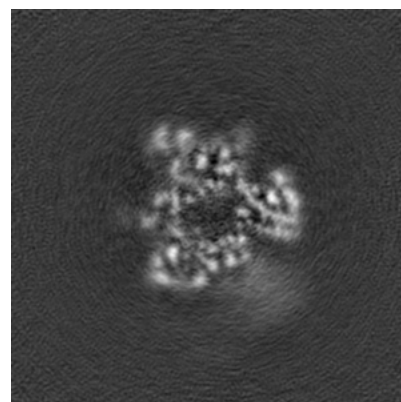
| X Index: 110 | Y Index: 110 | Z Index: 110 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
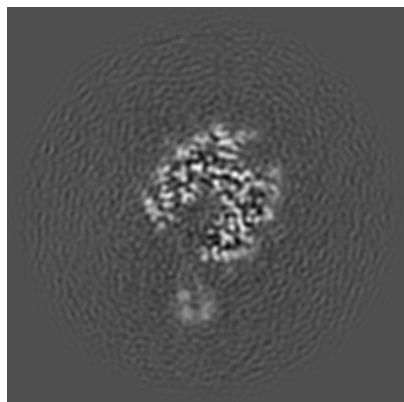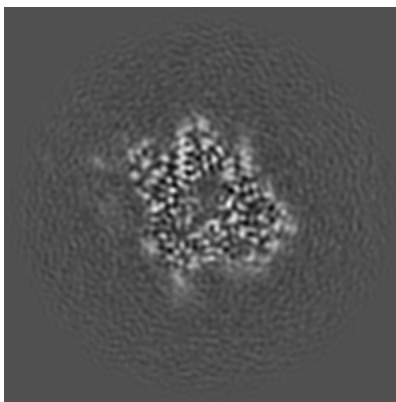
| X Index: 110 | Y Index: 114 | Z Index: 107 |
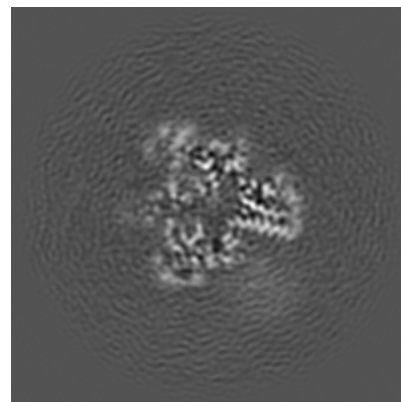
6.3.2 Raw map
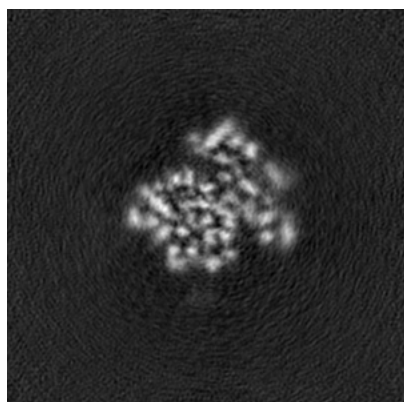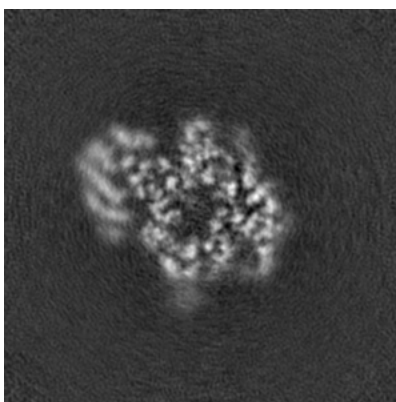
| X Index: 89 | Y Index: 108 | Z Index: 104 |
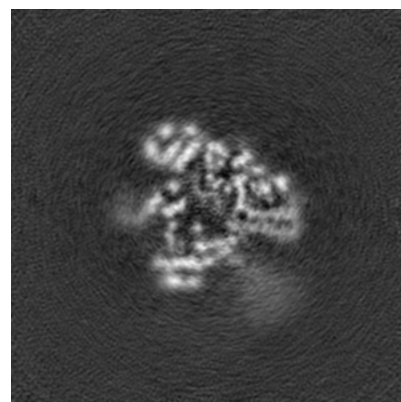
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1   Primary map
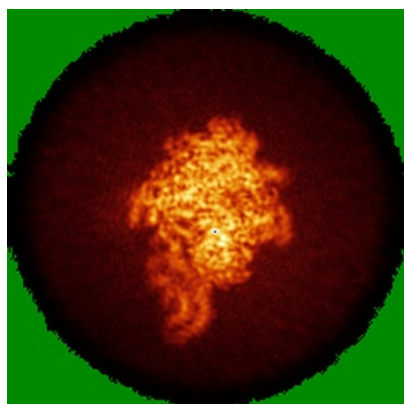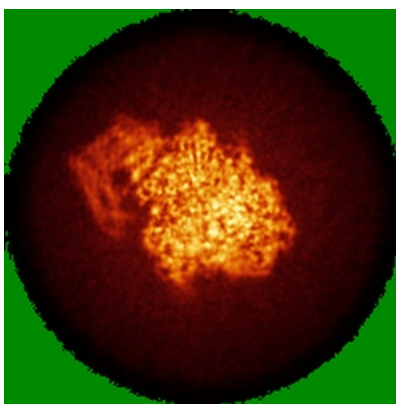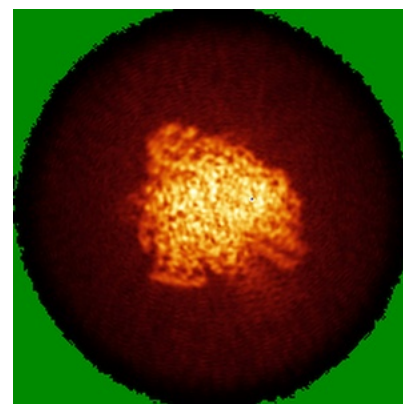
| X | Y | Z |

6.4.2   Raw map

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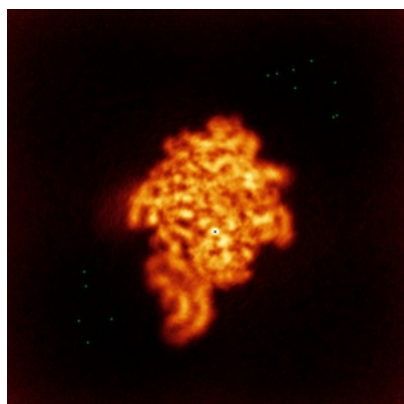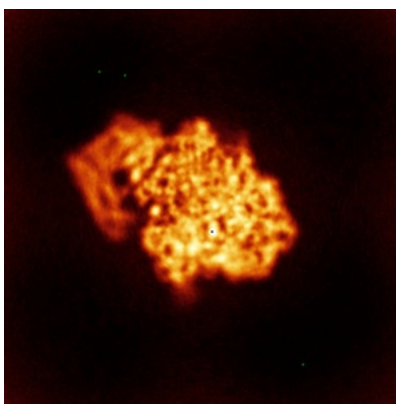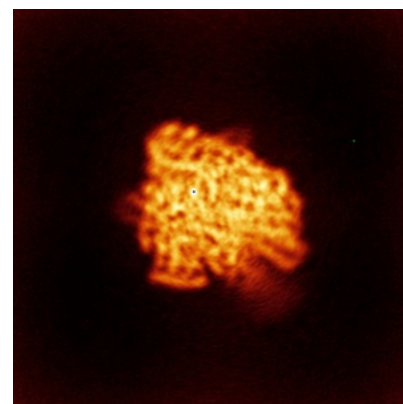
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |
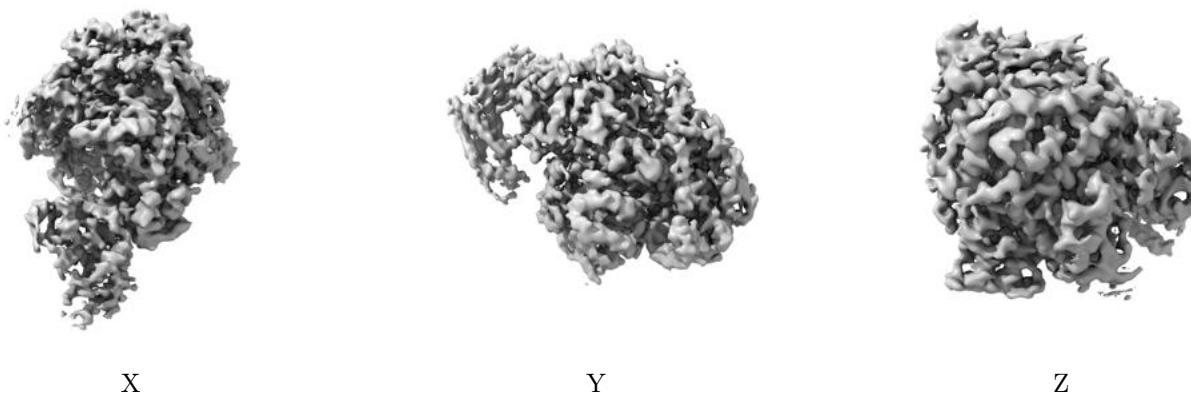
The images above show the 3D surface view of the map at the recommended contour level 0.32. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

| X | Y | Z |
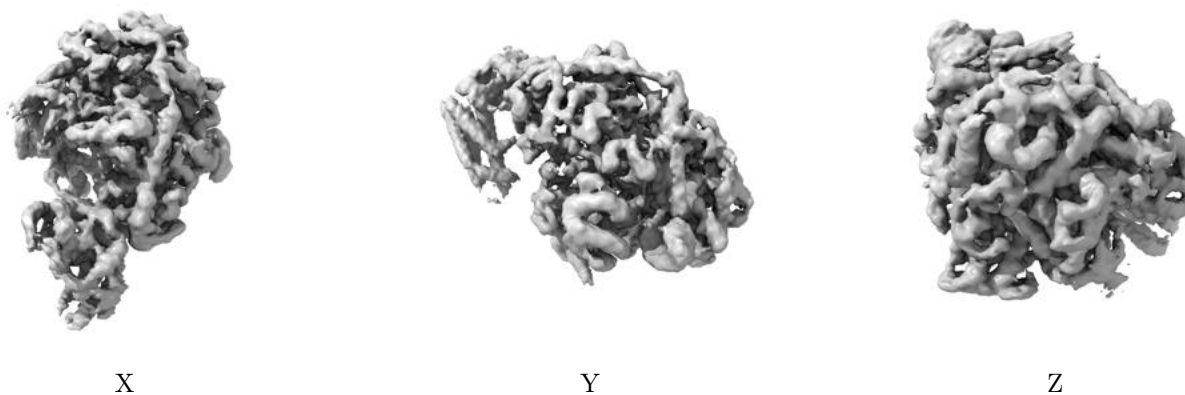
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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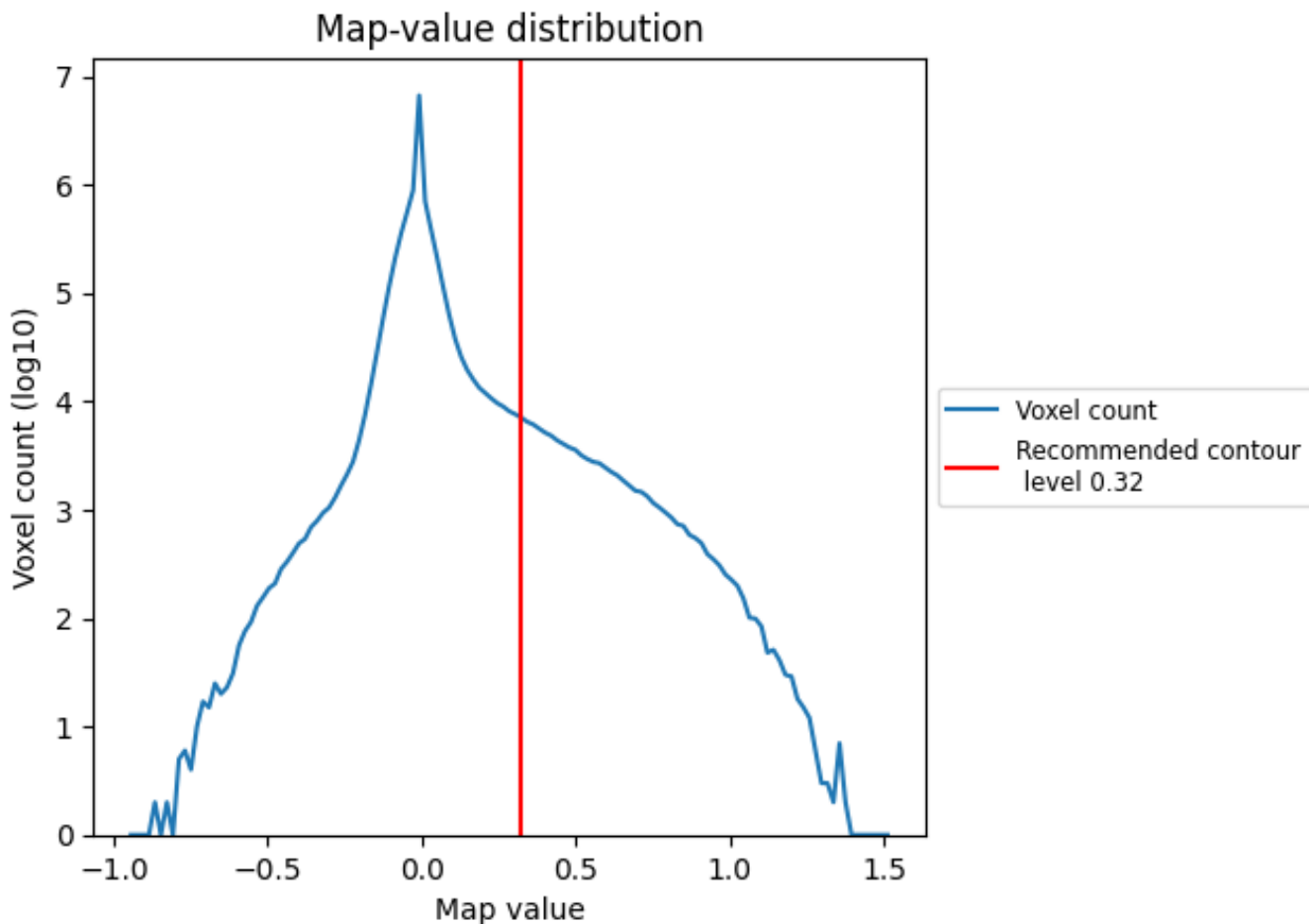
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
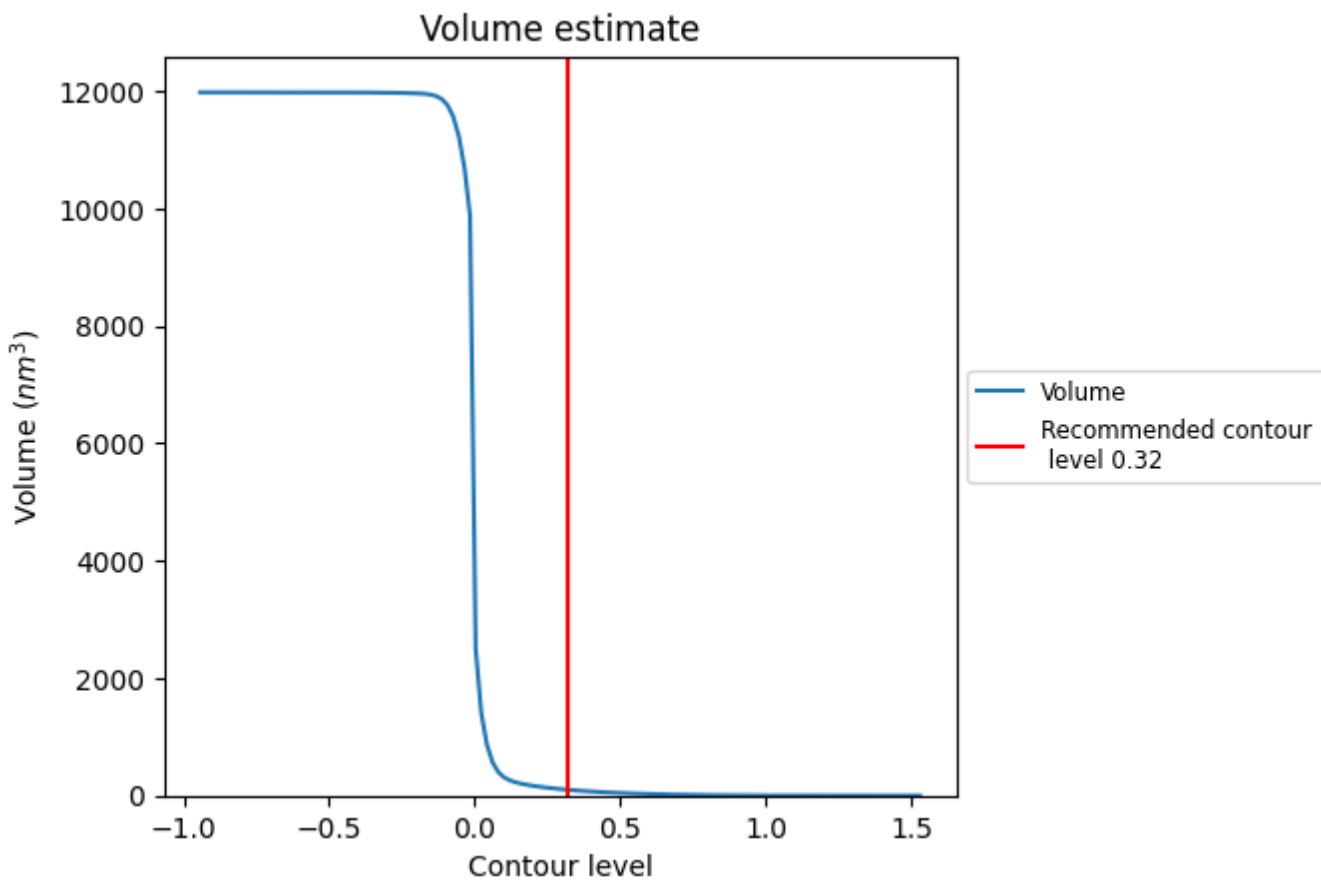
The volume at the recommended contour level is 99 nm^3; this corresponds to an approximate mass of 89 kDa.

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 ⓘ
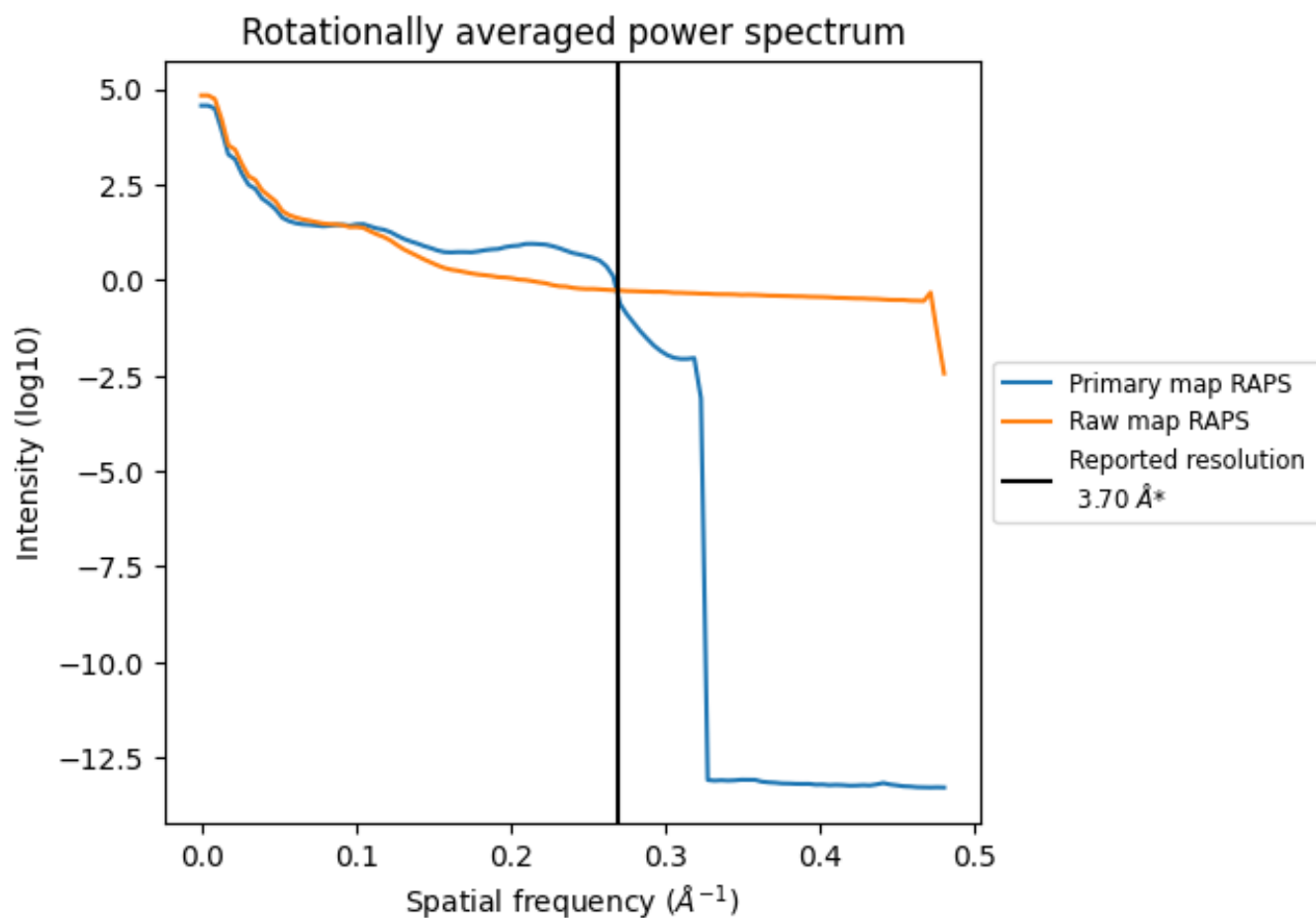
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

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 ⓘ
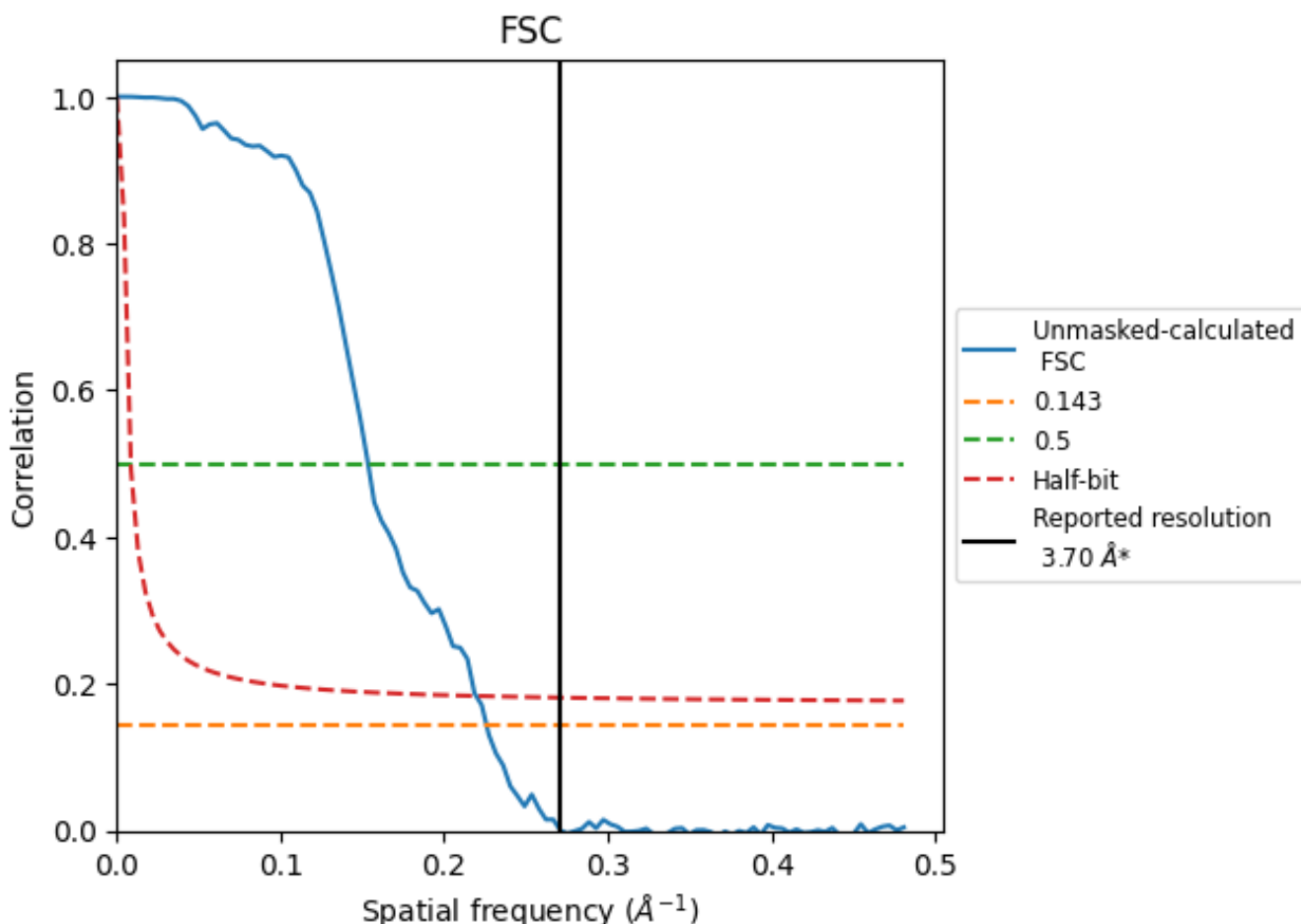
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.43	6.51	4.55

*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 4.43 differs from the reported value 3.7 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-37253 and PDB model 8KI7. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay ⓘ

| X | Y | Z |
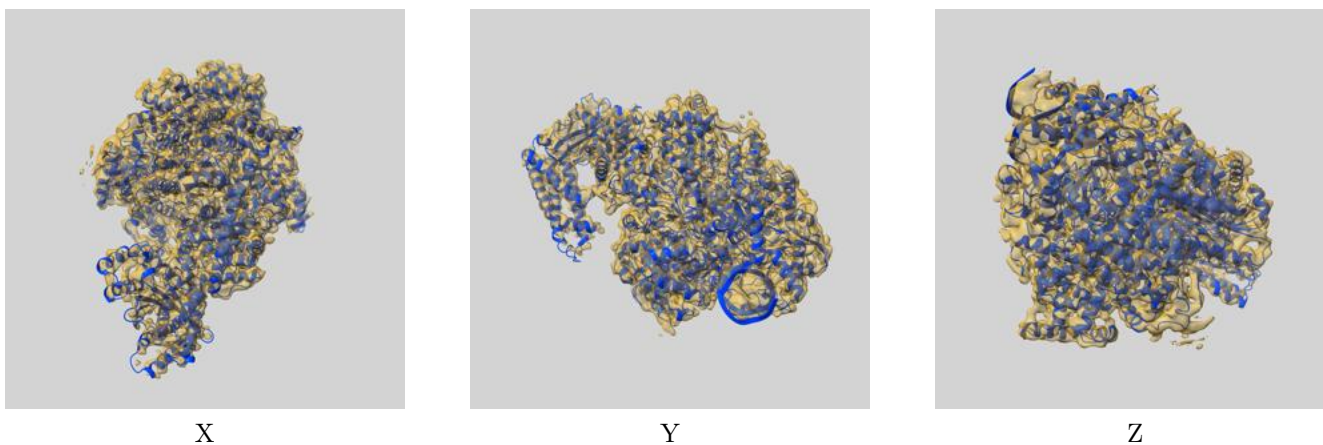
The images above show the 3D surface view of the map at the recommended contour level 0.32 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ
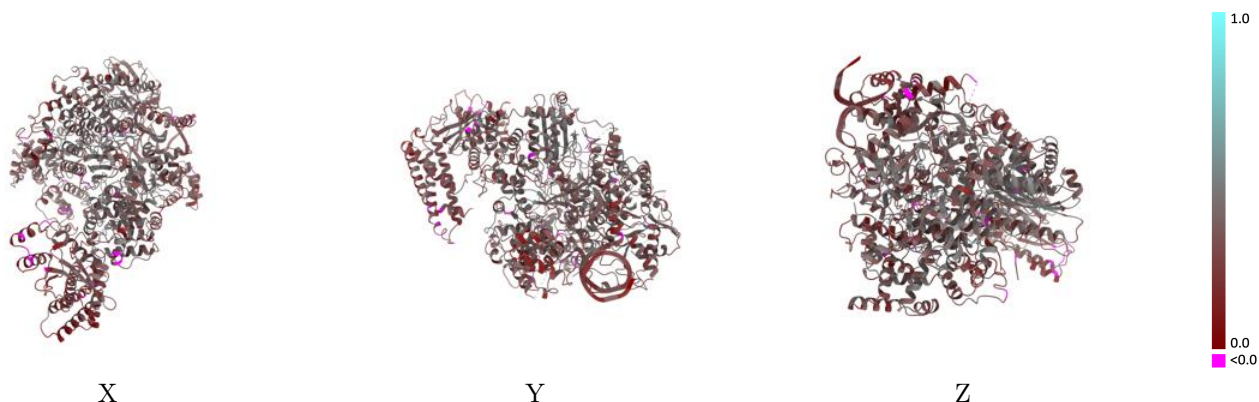
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 ⓘ
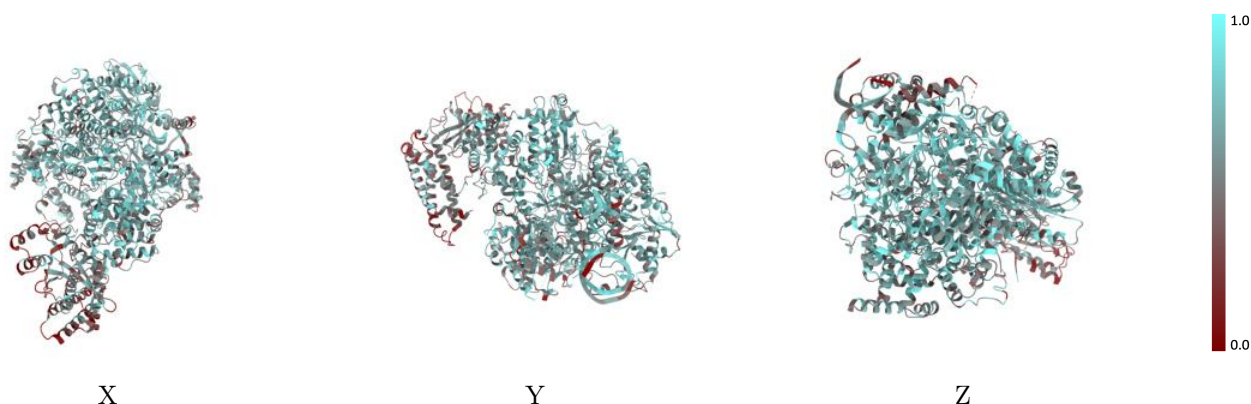
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.32).

9.4 Atom inclusion ⓘ
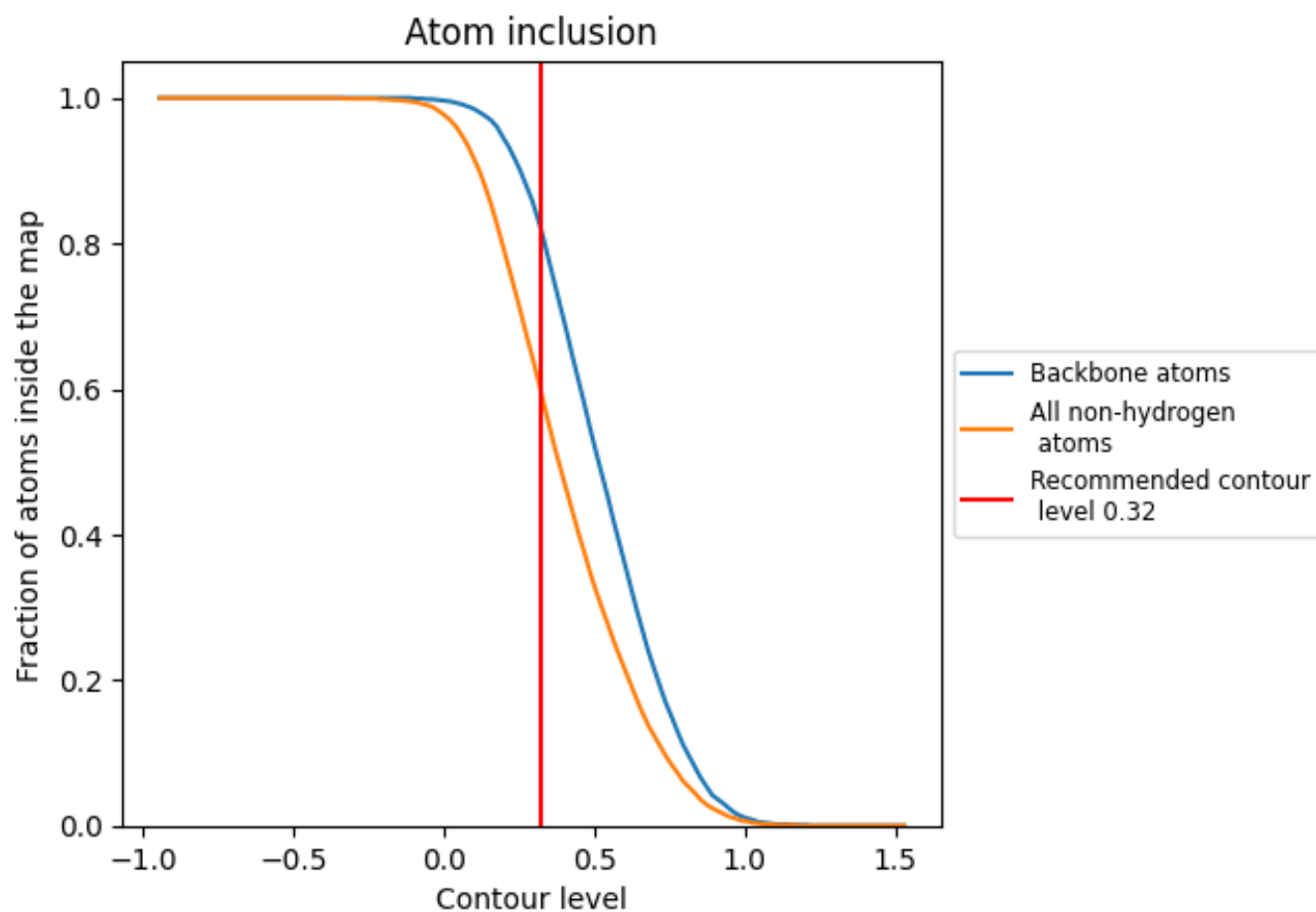
At the recommended contour level, 82% of all backbone atoms, 60% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.32) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6030	0.3350
A	0.6010	0.3370
B	0.5740	0.2450
E	0.7970	0.3630
F	0.5890	0.2640

1.0

0.0

<0.0