



Full wwPDB EM Validation Report ⓘ

Aug 6, 2026 – 09:06 AM EDT

PDB ID : 9YQK / pdb_00009yqk
EMDB ID : EMD-73338
Title : C-terminal LRRK2 bound to C12 DARPin
Authors : Sanz-Murillo, M.; Leschziner, A.
Deposited on : 2025-10-15
Resolution : 3.60 Å(reported)
Based on initial model : 6VP7

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.dev133
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

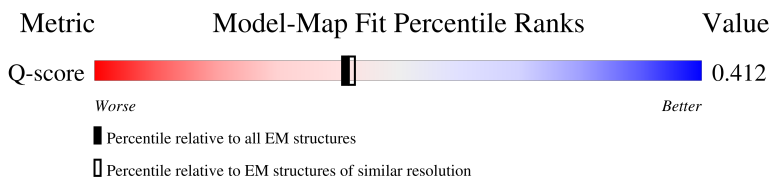
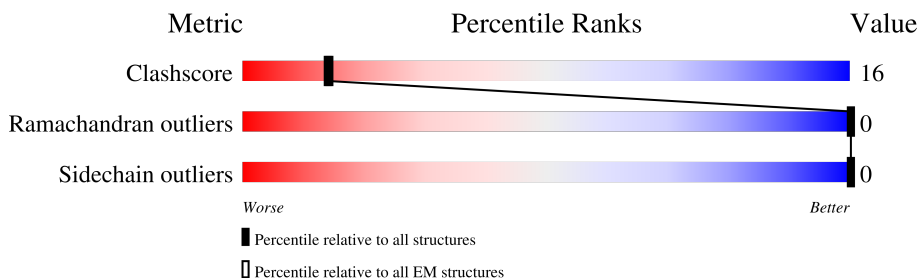
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.60 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	12797 (3.10 - 4.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2527	 27% 14% 60%
2	B	131	 42% 34% 24%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 8925 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 Leucine-rich repeat serine/threonine-protein kinase 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1023	Total	C	N	O	S	0	0
			8174	5247	1398	1480	49		

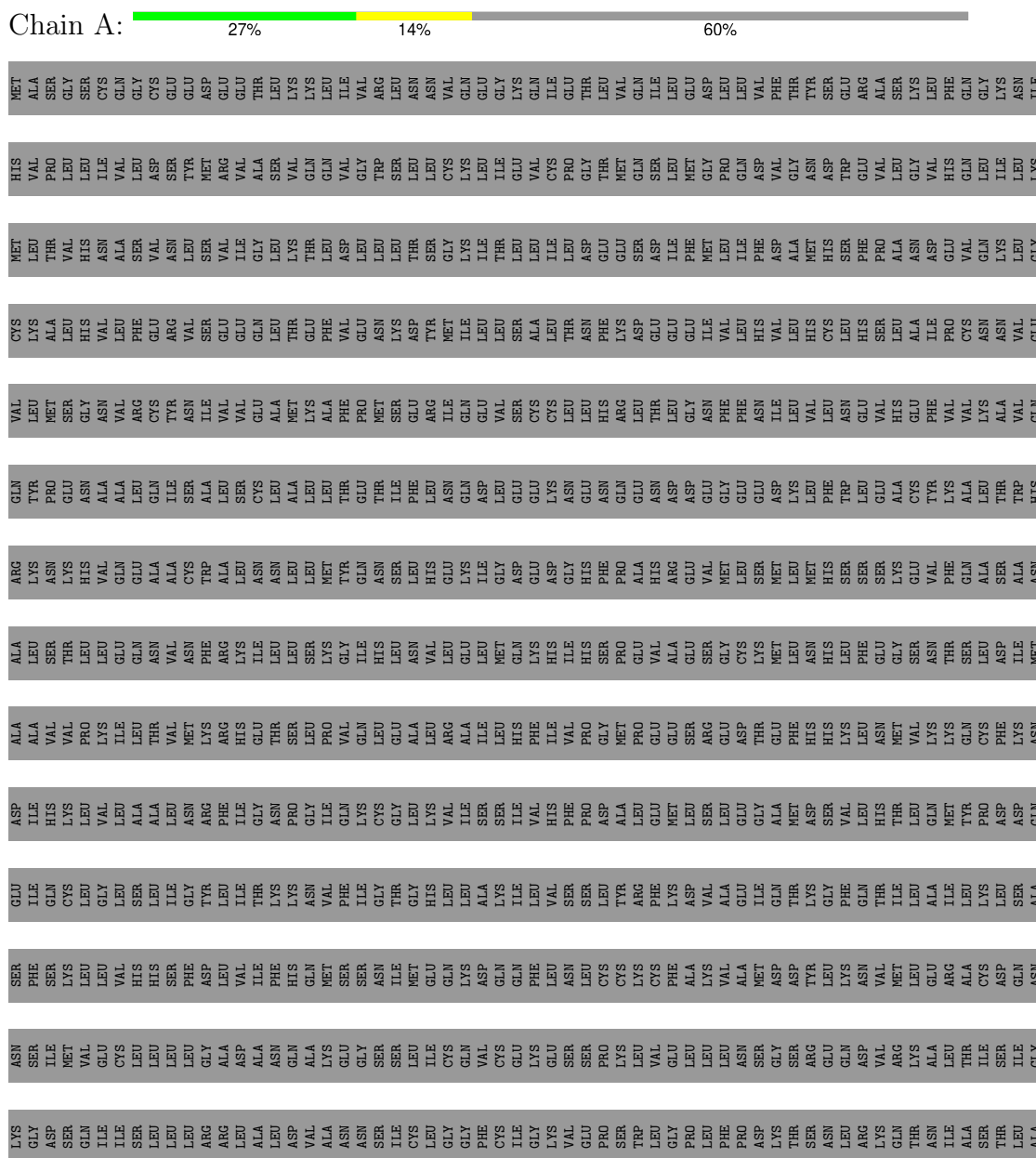
- Molecule 2 is a protein called C12 DARPin.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	100	Total	C	N	O	S	0	0
			751	474	125	150	2		

3 Residue-property plots

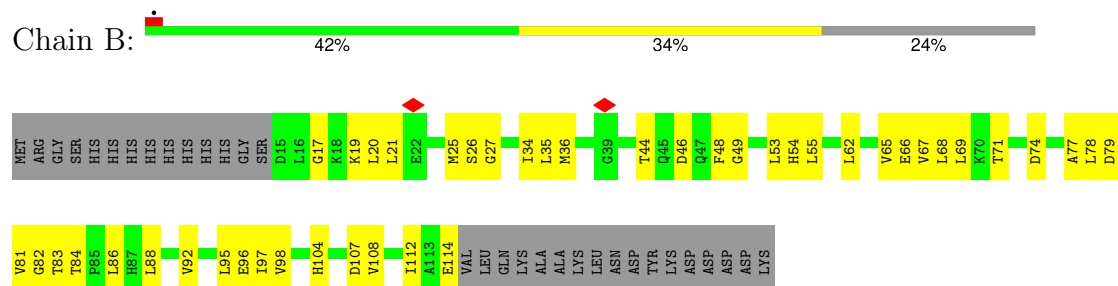
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Leucine-rich repeat serine/threonine-protein kinase 2



L1932	I1933	P1846	GLN	E1753	GLU	TTR	LEU	R1501	E1400	PHE	PRO	LEU	TLE	LYS	ASN	SER	ARG
I1934	S1934	R1847	GLN	K1502	F1401		GLN	K1503	F1401	LEU	PRO	ASP	SER	CYS	ALA	SER	MET
L1935	L1848	R1757	S1592	I1503	Y1402		S1593	I1504	Y1402	GLN	GLU	MET	LEU	PRO	THR	LEU	VAL
L1936	L1849	H1758	D1594	I1505	H1405		ARG	I1505	H1405	ARG	GLY	SER	SER	LEU	PHE	LYS	TYR
A1937	I1850		L1595	F1511	P1406		LEU	F1511	P1406	LEU	CYS	ASN	GLU	GLN	PRO	LYS	LYS
A1938	P1851	L1763	Y1596				LYS			LYS	LEU	ASP	ASN	PHE	GLN	HIS	MET
G1939	I1855	K1764	F1597				ILE			VAL	GLU	ILE	ASN	GLN	GLN	SER	VAL
I1940			W1598				ASP			ALA	ASN	GLN	LEU	ARG	ASN	ASN	LYS
M1944	L1859		K1601				GLN			P1331	SER	PRO	CYS	TYR	SER	VAL	VAL
L1945	I1860		W1602				ASP				THR	TYR	ALA	SER	ILE	ILE	ALA
V1946	R1693		L1603				LEU			M1335	LEU	GLY	VAL	ASN	THR	GLY	GLU
M1947	A1862						VAL			K1336	ASP	PRO	LYS	GLN	LEU	GLY	GLU
E1948	L1863		Y1695				VAL			L1337	VAL	ALA	VAL	SER	LEU	GLY	GLY
L1949	L1864		E1696				GLY			M1338	SER	HIS	GLU	SER	THR	PHE	THR
	P1865		M1697				GLN			I1339	TYR	TRP	SER	LEU	LEU	TYR	ALA
	R1866						ILE			Y1340	ASN	LYS	PHE	VAL	THR	ARG	SER
			P1701				PRO			L1351	GLU	LEU	SER	PRO	HIS	GLY	GLY
	M1869		F1792				D1525				LEU	LEU	ALA	ASP	ALA	SER	ALA
D1962	L1870		Y1613				PRO			M1355	LEU	ASN	ARG	ASN	ASP	VAL	VAL
L1966	L1875		LYS				LYS				ARG	GLU	MET	LEU	LEU	GLY	GLY
T1967	E1876		VAL				VAL			LYS	SER	ARG	ASN	THR	HIS	GLN	ASN
R1968	E1877		GLU				E1531			THR	PHE	GLU	PHE	ASP	ASP	PHE	GLY
F1969	E1878		CYS				E1534			LYS	PRO	LEU	LEU	VAL	LYS	SER	GLU
L1970			PRO				I1534			LYS	ASN	LEU	ALA	VAL	VAL	THR	CYS
			ILE				R1538			LYS	GLY	LEU	ALA	GLY	GLY	ASP	GLY
	F1883		LYS				R1538			ASP	MET	SER	MET	GLY	THR	ASN	VAL
	L1884		HIS							GLY	GLY	HIS	PRO	LEU	SER	LEU	VAL
	L1885		PRO				PRO			GLY	LYS	ASN	PHE	GLU	PHE	GLN	SER
	GL1888		GLY				GLY			MET	LEU	GLN	LEU	GLN	ALA	ARG	LYS
			ILE				E1544			GLN	SER	ILE	PRO	LEU	SER	PHE	ASP
			ILE				E1545			THR	LYS	ILE	PRO	ILE	TYR	GLU	SER
	G1891		ILE				I1548			W1369	ASP	ASP	THR	ASN	MET	GLY	PHE
	S1892		S1627				D1548			G1370	LEU	LEU	ILE	ASN	GLY	GLY	THR
ALA			R1628				R1550			I1371	PRO	SER	LEU	LYS	SER	ILE	PRO
MET			R1629				K1551			D1372	LEU	GLU	LYS	ILE	CYS	PHE	ALA
ILE			E1632				R1552			Y1373	ASP	ALA	SER	GLY	ALA	ASP	SER
							L1553			GLU	GLU	LEU	GLN	ILE	ASN	HIS	SER
			K1637				L1554			I1378	LEU	TYR	GLN	CYS	GLN	LYS	GLY
			K1638				N1560				HIS	LEU	ASN	LYS	LEU	MET	ASP
			R1639				Q1561			GLN	TRP	TRP	LYS	ASP	ASP	CYS	ASP
			K1640				Q1562			ILE	LEU	SER	PHE	VAL	VAL	LEU	SER
			F1641				L1562			ARG	ASN	SER	PHE	SER	ARG	LEU	VAL
			P1642				Q1563			ASP	PHE	VAL	CYS	ARG	ARG	LYS	PHE
										LYS	PHE	GLU	ILE	LEU	ASN	VAL	ALA
			M1646				E1566			ARG	LYS	LYS	PRO	LYS	ASP	LYS	GLN
			S1647				N1567			ASP	HIS	LEU	ALA	GLY	ILE	ARG	SER
			Q1648				E1568			ARG	ILE	LEU	ALA	LEU	PRO	GLY	LEU
			Y1649				P1570			L1388	GLY	LEU	ILE	LYS	PRO	ILE	ASP
											ASP	HIS	ALA	LEU	GLY	GLY	ASP
			F1656				L1569			V1392	LYS	SER	ILE	LYS	PRO	ILE	ASP
			Q1657				P1570			W1393	CYS	HIS	ASN	LEU	VAL	LEU	LEU
			L1660				L1576			A1396	ALA	HIS	ASN	ASN	VAL	SER	ASP
			P1661				L1582			W1393	LYS	LYS	LEU	ASN	VAL	LYS	GLY
			ILE				L1587			A1397	ASP	LEU	PRO	LEU	LEU	ASP	GLY
			GLY				D1587			G1397	ILE	LYS	LEU	SER	ASP	GLY	GLY
			GLU				PRO			R1398	ILE	LYS	ARG	ASN	PRO	LEU	GLY
			ALA				L1500			E1399	ARG	ILE	SER	GLN	VAL	GLY	ARG

- Molecule 2: C12 DARPin



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	392016	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	2500	Depositor
Maximum defocus (nm)	36000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	89.698	Depositor
Minimum map value	-71.407	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.930	Depositor
Recommended contour level	5.14	Depositor
Map size (Å)	334.08, 334.08, 334.08	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.16, 1.16, 1.16	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.19	0/8329	0.44	2/11254 (0.0%)
2	B	0.17	0/761	0.47	0/1036
All	All	0.19	0/9090	0.45	2/12290 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	1928	HIS	CA-C-N	5.17	127.19	120.26
1	A	1928	HIS	C-N-CA	5.17	127.19	120.26

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1928	HIS	Peptide
1	A	1929	HIS	Peptide

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within

the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8174	0	8315	251	0
2	B	751	0	745	33	0
All	All	8925	0	9060	279	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 16.

All (279) 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:1468:LYS:NZ	1:A:1472:GLU:OE1	2.13	0.82
1:A:2375:VAL:HG21	1:A:2442:ARG:HH22	1.42	0.82
2:B:20:LEU:HD23	2:B:44:THR:HG21	1.65	0.79
1:A:1400:GLU:OE1	1:A:1657:GLN:NE2	2.14	0.79
1:A:1733:TYR:HB3	1:A:1738:ILE:HG22	1.64	0.79
1:A:1935:LEU:HD11	1:A:1945:LEU:HD22	1.63	0.79
1:A:1592:LEU:HD21	1:A:1648:GLN:HB3	1.66	0.77
1:A:1419:TYR:HB3	1:A:1431:MET:HE1	1.69	0.74
2:B:74:ASP:HB3	2:B:77:ALA:HB2	1.70	0.74
1:A:1396:ALA:HB3	1:A:1398:ARG:HH21	1.52	0.74
1:A:1933:ILE:HD11	1:A:2001:LEU:HD12	1.68	0.73
1:A:2092:LEU:HD21	1:A:2115:LEU:HD23	1.70	0.73
1:A:2155:MET:HE1	1:A:2473:LEU:HB2	1.72	0.72
1:A:1602:TRP:O	1:A:1606:ILE:HG13	1.91	0.71
1:A:1863:ASP:OD2	1:A:1918:ARG:NH2	2.21	0.70
1:A:1771:ARG:HH22	1:A:1866:ARG:HG2	1.57	0.70
1:A:1888:GLY:O	1:A:1910:LYS:NZ	2.22	0.69
1:A:1883:PHE:HE2	1:A:1895:ARG:HD3	1.57	0.69
1:A:1712:LEU:HD22	1:A:1738:ILE:HD11	1.75	0.69
1:A:1660:LEU:O	1:A:1668:LEU:N	2.26	0.68
1:A:2136:GLU:OE2	1:A:2446:ARG:NH2	2.26	0.68
1:A:1639:ARG:NH1	1:A:1640:LYS:O	2.26	0.68
2:B:53:LEU:HD22	2:B:68:LEU:HD13	1.74	0.68
1:A:1705:TRP:O	1:A:1709:ILE:HG12	1.93	0.68
1:A:1660:LEU:HD13	1:A:1710:ASN:HB3	1.75	0.67
1:A:2194:VAL:HG11	1:A:2227:ILE:HD11	1.77	0.67
2:B:25:MET:HG2	2:B:55:LEU:HD23	1.76	0.67
1:A:1405:HIS:HA	1:A:1441:ARG:NH1	2.10	0.67
1:A:1371:ILE:HD11	1:A:1402:TYR:HE2	1.60	0.66
1:A:1404:THR:O	1:A:1441:ARG:NH1	2.27	0.66

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1673:LEU:HB2	1:A:1735:ARG:HB3	1.78	0.66
1:A:2207:LEU:O	1:A:2211:LYS:N	2.29	0.65
1:A:2212:GLU:OE2	1:A:2228:ASN:ND2	2.30	0.65
2:B:54:HIS:NE2	2:B:83:THR:O	2.28	0.65
1:A:1552:ARG:HD2	1:A:1552:ARG:O	1.97	0.65
1:A:2299:PRO:O	1:A:2320:GLY:N	2.27	0.65
1:A:1924:LEU:HD21	1:A:1947:MET:HE1	1.78	0.64
1:A:2107:VAL:HG23	1:A:2137:LEU:HD11	1.78	0.64
2:B:36:MET:HE3	2:B:71:THR:HG21	1.79	0.64
1:A:1337:LEU:HD23	1:A:1392:VAL:HG12	1.80	0.64
1:A:1531:GLU:HG3	1:A:1576:LEU:HD11	1.80	0.64
1:A:1827:LEU:HD12	1:A:1859:LEU:HD21	1.81	0.63
1:A:1405:HIS:CE1	1:A:1656:PHE:HA	2.34	0.63
1:A:2360:ASP:OD1	1:A:2361:THR:N	2.30	0.62
1:A:2287:PRO:HG2	1:A:2290:ILE:HD11	1.81	0.62
1:A:1543:ILE:HG13	1:A:1545:PHE:H	1.63	0.61
1:A:1870:LEU:HB3	1:A:1937:ALA:HB1	1.83	0.60
1:A:1569:LEU:HD23	1:A:1570:PRO:HD3	1.83	0.59
1:A:1756:ASP:O	1:A:1758:HIS:ND1	2.34	0.59
1:A:2442:ARG:HD2	2:B:48:PHE:CE1	2.37	0.59
1:A:1629:ARG:HH21	1:A:1632:GLU:HG3	1.67	0.59
1:A:1470:THR:HG23	1:A:1474:LEU:HD12	1.84	0.59
1:A:2152:VAL:HG13	1:A:2473:LEU:HD21	1.84	0.59
1:A:2246:THR:OG1	1:A:2300:LEU:O	2.21	0.59
1:A:2410:TYR:O	1:A:2413:ARG:NH1	2.36	0.58
1:A:1657:GLN:HB2	1:A:1707:ARG:HH12	1.68	0.58
2:B:69:LEU:HD23	2:B:104:HIS:CG	2.39	0.58
1:A:1489:ASN:OD1	1:A:1490:ALA:N	2.36	0.58
1:A:1905:VAL:HG12	1:A:1946:VAL:HG22	1.86	0.58
1:A:1530:LEU:HD11	1:A:1561:GLN:HE21	1.68	0.57
1:A:1405:HIS:O	1:A:1441:ARG:NH2	2.32	0.57
1:A:2227:ILE:HG12	1:A:2235:ARG:HG2	1.85	0.57
1:A:2429:THR:OG1	1:A:2433:HIS:HB2	2.05	0.57
1:A:2512:GLU:OE1	1:A:2515:LYS:NZ	2.33	0.57
1:A:1921:LEU:HD21	1:A:1945:LEU:HD21	1.86	0.56
1:A:2061:LEU:HD12	1:A:2072:ARG:CZ	2.35	0.56
1:A:2266:GLY:HA3	1:A:2300:LEU:HD22	1.87	0.56
1:A:2300:LEU:HA	1:A:2319:CYS:HA	1.86	0.56
1:A:1746:ALA:HA	1:A:1768:PRO:HG2	1.87	0.56
1:A:1934:SER:OG	1:A:1948:GLU:OE1	2.19	0.56
1:A:2391:HIS:NE2	2:B:81:VAL:O	2.39	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2342:GLN:HE22	1:A:2348:ALA:HA	1.70	0.56
1:A:1791:TRP:HD1	1:A:1791:TRP:O	1.88	0.56
1:A:1878:GLU:OE1	1:A:1878:GLU:N	2.38	0.56
1:A:2166:SER:HA	1:A:2183:ASP:HA	1.88	0.56
1:A:2172:GLY:O	1:A:2198:ARG:NH1	2.39	0.56
1:A:1405:HIS:CE1	1:A:1406:PRO:HG3	2.41	0.55
1:A:1371:ILE:HD11	1:A:1402:TYR:CE2	2.39	0.55
1:A:1909:ASN:OD1	1:A:1910:LYS:N	2.40	0.55
1:A:1810:LYS:NZ	1:A:1811:TRP:O	2.40	0.54
1:A:1739:TYR:CE2	1:A:1741:ASN:HB2	2.43	0.54
1:A:1924:LEU:HD23	1:A:1935:LEU:HD13	1.89	0.54
1:A:2375:VAL:HG21	1:A:2442:ARG:NH2	2.19	0.54
1:A:2216:VAL:HG13	1:A:2248:LEU:HD23	1.89	0.54
1:A:2231:ASP:OD2	1:A:2234:LYS:NZ	2.40	0.54
1:A:2420:GLN:HE21	1:A:2424:ALA:HB3	1.72	0.54
1:A:2468:ASN:HB2	1:A:2498:ILE:HG21	1.89	0.54
1:A:1459:GLU:HG2	1:A:1462:ARG:HH21	1.73	0.53
1:A:2159:HIS:ND1	1:A:2161:ASN:OD1	2.38	0.53
1:A:2416:THR:OG1	1:A:2458:MET:HE3	2.07	0.53
1:A:2228:ASN:OD1	1:A:2231:ASP:N	2.38	0.53
1:A:2448:ILE:HG21	1:A:2496:TRP:CH2	2.43	0.53
1:A:1885:LEU:HD11	1:A:1895:ARG:HD2	1.91	0.53
1:A:1895:ARG:NH2	1:A:1949:LEU:O	2.42	0.53
1:A:1560:ASN:HB3	1:A:1563:GLN:HB2	1.91	0.52
1:A:1861:LEU:HG	1:A:1940:ILE:HD13	1.91	0.52
1:A:2420:GLN:NE2	1:A:2501:PRO:HG2	2.24	0.52
1:A:1594:ASP:OD1	1:A:1595:LEU:N	2.42	0.52
1:A:1713:LEU:HD22	1:A:1731:ARG:HD3	1.91	0.52
1:A:2141:THR:HG22	1:A:2142:ARG:HG2	1.90	0.52
1:A:1405:HIS:HA	1:A:1441:ARG:HH12	1.74	0.52
1:A:1551:LYS:HD3	1:A:1551:LYS:O	2.09	0.52
1:A:1875:LEU:HD13	1:A:1898:TYR:HD2	1.75	0.52
1:A:1401:PHE:HZ	1:A:1611:LEU:HD13	1.75	0.51
1:A:2302:CYS:SG	1:A:2357:VAL:N	2.83	0.51
1:A:2207:LEU:O	1:A:2211:LYS:CA	2.58	0.51
1:A:1791:TRP:C	1:A:1793:PRO:HD3	2.36	0.51
1:A:2176:ARG:HH21	1:A:2196:ASP:HA	1.76	0.51
1:A:1469:ILE:HG23	1:A:1473:LEU:HD12	1.92	0.51
1:A:1484:ASP:OD1	1:A:1485:TYR:N	2.44	0.51
1:A:1530:LEU:HD11	1:A:1561:GLN:HG3	1.93	0.51
1:A:1807:LEU:HG	1:A:1808:LEU:H	1.77	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1814:TYR:HB2	1:A:1855:ILE:HD12	1.92	0.50
1:A:2152:VAL:HG21	1:A:2169:LEU:HD23	1.93	0.50
1:A:1863:ASP:OD1	1:A:1864:LEU:N	2.44	0.50
1:A:1531:GLU:O	1:A:1534:ILE:HG12	2.11	0.50
2:B:62:LEU:HD13	2:B:97:ILE:HD13	1.93	0.50
1:A:1335:MET:HE1	1:A:1414:LEU:HD11	1.94	0.49
1:A:1538:ARG:HD2	1:A:1598:VAL:HG21	1.94	0.49
1:A:1606:ILE:HG21	1:A:1641:PHE:HE1	1.76	0.49
1:A:1709:ILE:O	1:A:1713:LEU:HG	2.12	0.49
2:B:86:LEU:HD11	2:B:98:VAL:HG13	1.94	0.49
1:A:1339:ILE:HD12	1:A:1351:LEU:HD12	1.94	0.49
1:A:1534:ILE:O	1:A:1538:ARG:HG2	2.13	0.49
1:A:2391:HIS:CD2	2:B:82:GLY:HA3	2.48	0.49
1:A:1469:ILE:O	1:A:1473:LEU:HB2	2.13	0.49
2:B:79:ASP:OD1	2:B:80:TRP:N	2.45	0.49
1:A:1982:LEU:HD21	1:A:1995:LEU:HD22	1.93	0.49
1:A:2236:HIS:HB2	1:A:2283:LYS:HD3	1.94	0.49
1:A:1693:ARG:HB3	1:A:1810:LYS:NZ	2.28	0.49
1:A:2438:ASP:HB3	1:A:2441:THR:O	2.13	0.48
1:A:2421:LYS:HG3	1:A:2422:ASN:ND2	2.28	0.48
1:A:2124:THR:HG23	1:A:2127:GLN:H	1.78	0.48
2:B:34:ILE:HG13	2:B:35:LEU:HD12	1.96	0.48
1:A:2207:LEU:O	1:A:2211:LYS:HA	2.13	0.48
1:A:2343:LEU:HD21	2:B:95:LEU:HD22	1.94	0.48
1:A:1693:ARG:HB3	1:A:1810:LYS:HZ3	1.78	0.48
1:A:2354:ILE:HD11	1:A:2365:ILE:HG23	1.95	0.48
2:B:21:LEU:HD11	2:B:46:ASP:HB3	1.94	0.48
1:A:1336:LYS:HE2	1:A:1409:MET:HE1	1.96	0.48
1:A:1693:ARG:HH21	1:A:1810:LYS:HE3	1.78	0.48
2:B:78:LEU:HD11	2:B:82:GLY:HA2	1.96	0.48
1:A:2276:GLU:HG3	1:A:2278:LYS:H	1.78	0.48
1:A:1609:GLN:O	1:A:1612:THR:OG1	2.23	0.48
1:A:1840:LEU:O	1:A:1848:LEU:HB2	2.14	0.48
1:A:1641:PHE:HD2	1:A:1642:PRO:HD2	1.79	0.47
1:A:1497:LEU:HB3	1:A:1501:ARG:HH22	1.80	0.47
1:A:1795:LEU:H	1:A:1795:LEU:HD23	1.79	0.47
1:A:1410:THR:O	1:A:1445:SER:OG	2.33	0.47
1:A:2146:LEU:HD21	1:A:2182:LEU:HD22	1.95	0.47
1:A:2340:THR:HB	2:B:92:VAL:HA	1.95	0.47
1:A:1968:ARG:HH21	1:A:2102:ALA:HB3	1.79	0.47
2:B:95:LEU:H	2:B:95:LEU:HD23	1.79	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1695:TYR:HB2	1:A:1763:LEU:HB3	1.95	0.47
1:A:1430:ALA:O	1:A:1433:PRO:HD2	2.15	0.47
1:A:2422:ASN:HA	1:A:2439:LEU:HD12	1.96	0.47
1:A:1811:TRP:CE3	1:A:1824:LYS:HB3	2.49	0.47
1:A:2387:ILE:HD11	1:A:2442:ARG:CZ	2.45	0.47
2:B:84:THR:C	2:B:86:LEU:H	2.23	0.47
1:A:2420:GLN:HE22	1:A:2501:PRO:HG2	1.80	0.46
1:A:1401:PHE:CE1	1:A:1611:LEU:HD22	2.51	0.46
2:B:46:ASP:OD1	2:B:49:GLY:N	2.48	0.46
1:A:1836:GLU:HG3	1:A:1838:ASP:H	1.80	0.46
1:A:2199:ILE:HD11	1:A:2217:SER:HB3	1.96	0.46
2:B:17:GLY:O	2:B:21:LEU:HG	2.15	0.46
1:A:1753:GLU:OE2	1:A:1764:LYS:HD2	2.16	0.46
1:A:1832:LYS:HB2	1:A:1832:LYS:HE3	1.80	0.46
1:A:1454:LEU:HB3	1:A:1489:ASN:HA	1.98	0.46
1:A:2064:TYR:CE1	1:A:2095:PRO:HG3	2.50	0.46
1:A:2214:TRP:CE3	1:A:2226:VAL:HG12	2.51	0.46
1:A:1404:THR:OG1	1:A:1405:HIS:N	2.50	0.45
1:A:1628:ARG:O	1:A:1632:GLU:HG2	2.15	0.45
1:A:1436:PHE:CD2	1:A:1701:PRO:HB3	2.51	0.45
1:A:1775:ILE:HA	1:A:1863:ASP:HB2	1.98	0.45
1:A:1786:SER:OG	1:A:1915:ARG:NH2	2.49	0.45
1:A:2438:ASP:OD1	1:A:2439:LEU:N	2.49	0.45
1:A:1603:LEU:HA	1:A:1606:ILE:HD12	1.99	0.45
1:A:1791:TRP:O	1:A:1791:TRP:CD1	2.68	0.45
1:A:1810:LYS:HG3	1:A:1827:LEU:HD23	1.98	0.45
1:A:1810:LYS:O	1:A:1826:LEU:HD12	2.17	0.45
1:A:1966:LEU:HD13	1:A:1970:LEU:HD23	1.99	0.45
1:A:2178:GLN:HB2	1:A:2192:GLU:O	2.16	0.45
2:B:62:LEU:HD11	2:B:96:GLU:HB3	1.99	0.45
1:A:1695:TYR:HD2	1:A:1808:LEU:HD11	1.82	0.45
1:A:1712:LEU:HD23	1:A:1712:LEU:O	2.17	0.45
1:A:2361:THR:O	1:A:2378:LYS:NZ	2.45	0.45
1:A:2364:TYR:CD2	1:A:2375:VAL:HG22	2.51	0.45
1:A:1877:PHE:HE2	1:A:1907:ILE:HD13	1.82	0.44
1:A:2201:CYS:SG	1:A:2248:LEU:HD13	2.58	0.44
1:A:1891:GLY:HA2	1:A:1910:LYS:HE2	1.98	0.44
1:A:2155:MET:HE3	1:A:2459:MET:HE1	1.99	0.44
1:A:1955:LEU:HD13	1:A:2002:LEU:HD11	1.99	0.44
2:B:88:LEU:O	2:B:92:VAL:HG12	2.17	0.44
2:B:92:VAL:HG13	2:B:92:VAL:O	2.18	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1814:TYR:HE1	1:A:1825:ILE:HB	1.82	0.44
2:B:26:SER:OG	2:B:27:GLY:N	2.51	0.44
1:A:1747:TYR:CD1	1:A:1768:PRO:HG3	2.53	0.44
1:A:1962:ASP:OD1	1:A:1962:ASP:N	2.51	0.44
1:A:1697:MET:HE1	1:A:1704:PHE:CE2	2.53	0.44
1:A:2151:ILE:HG12	1:A:2173:HIS:HB3	1.99	0.44
1:A:1340:VAL:O	1:A:1417:ALA:HA	2.18	0.43
1:A:1715:ILE:O	1:A:1742:TRP:HZ2	2.01	0.43
1:A:1898:TYR:HD1	1:A:1899:GLU:OE1	2.01	0.43
1:A:1455:ASP:OD1	1:A:1455:ASP:N	2.50	0.43
1:A:1606:ILE:HD13	1:A:1641:PHE:CE1	2.53	0.43
1:A:1864:LEU:HD11	1:A:1869:MET:SD	2.58	0.43
1:A:2097:LYS:HA	1:A:2097:LYS:HE2	2.00	0.43
1:A:2168:TRP:CE3	1:A:2215:ILE:HD13	2.53	0.43
1:A:2276:GLU:HG2	1:A:2279:THR:HG23	2.00	0.43
2:B:19:LYS:HA	2:B:19:LYS:HE2	1.99	0.43
1:A:1747:TYR:O	1:A:1768:PRO:HD3	2.18	0.43
1:A:1839:LEU:HD22	1:A:1851:PRO:HA	2.01	0.43
1:A:2356:THR:HG22	1:A:2366:ALA:HB3	2.00	0.43
2:B:65:VAL:HG21	2:B:97:ILE:HD12	2.00	0.43
1:A:1603:LEU:HD13	1:A:1606:ILE:HD12	1.99	0.43
1:A:1979:ALA:HB2	1:A:2059:PHE:CZ	2.53	0.43
1:A:1677:ARG:HH21	1:A:1680:ILE:HD13	1.84	0.43
1:A:1701:PRO:HG2	1:A:1704:PHE:HB2	2.00	0.43
2:B:62:LEU:O	2:B:66:GLU:HG3	2.19	0.43
1:A:1741:ASN:ND2	1:A:1747:TYR:HB3	2.34	0.43
1:A:1968:ARG:NH2	1:A:2102:ALA:HB3	2.34	0.43
1:A:2169:LEU:HB2	1:A:2180:SER:HB2	2.01	0.43
2:B:107:ASP:OD1	2:B:108:VAL:N	2.51	0.43
1:A:1458:ASP:O	1:A:1462:ARG:HG3	2.18	0.43
1:A:1470:THR:HA	1:A:1474:LEU:HG	1.99	0.43
1:A:1646:MET:HA	1:A:1649:TYR:CD2	2.53	0.43
1:A:1945:LEU:HD23	1:A:1945:LEU:HA	1.81	0.43
1:A:1933:ILE:HD12	1:A:2016:ALA:HA	2.00	0.43
1:A:2176:ARG:HE	1:A:2196:ASP:HA	1.82	0.43
1:A:2324:PHE:HE2	1:A:2326:PHE:HE2	1.67	0.43
1:A:1405:HIS:NE2	1:A:1656:PHE:HA	2.34	0.42
1:A:1562:LEU:HD23	1:A:1562:LEU:HA	1.85	0.42
1:A:1538:ARG:NH2	1:A:1548:ILE:HD13	2.34	0.42
1:A:1610:ILE:HD12	1:A:1610:ILE:H	1.84	0.42
1:A:2064:TYR:HE1	1:A:2095:PRO:HG3	1.84	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1841:VAL:HA	1:A:1848:LEU:HB2	2.01	0.42
1:A:1978:VAL:HG11	1:A:2062:LEU:CD2	2.50	0.42
1:A:2147:PRO:O	1:A:2150:VAL:HG12	2.20	0.42
2:B:66:GLU:OE2	2:B:67:VAL:HG13	2.20	0.42
1:A:1550:ARG:HB2	1:A:1594:ASP:HB2	2.01	0.42
1:A:1893:VAL:HG12	1:A:1906:LYS:HA	2.02	0.41
1:A:1582:LEU:HB2	1:A:1597:PHE:O	2.21	0.41
1:A:1677:ARG:HE	1:A:1680:ILE:HD13	1.85	0.41
1:A:1692:ILE:HG21	1:A:1764:LYS:HE2	2.02	0.41
1:A:1973:ARG:HB3	1:A:2012:ILE:HD12	2.02	0.41
1:A:2388:ASP:OD1	1:A:2390:VAL:HG22	2.20	0.41
2:B:112:ILE:O	2:B:114:GLU:HG3	2.20	0.41
1:A:1939:GLY:HA3	1:A:1944:MET:HG2	2.02	0.41
1:A:2263:LEU:HD23	1:A:2275:PHE:HD2	1.84	0.41
1:A:1830:LEU:HD12	1:A:1830:LEU:HA	1.93	0.41
1:A:2116:LYS:HG3	1:A:2121:GLU:OE1	2.20	0.41
1:A:2144:ILE:HD12	1:A:2187:GLU:OE1	2.20	0.41
1:A:2436:LEU:O	1:A:2437:LEU:HD22	2.20	0.41
2:B:62:LEU:HD21	2:B:96:GLU:HB2	2.01	0.41
1:A:1479:PHE:O	1:A:1481:ALA:N	2.47	0.41
1:A:1501:ARG:O	1:A:1505:ILE:HG12	2.21	0.41
1:A:1548:ILE:HD12	1:A:1554:LEU:HD12	2.01	0.41
1:A:2388:ASP:HB3	1:A:2391:HIS:CE1	2.55	0.41
1:A:1431:MET:HE3	1:A:1431:MET:HB2	1.93	0.41
1:A:1932:LEU:HD23	1:A:1932:LEU:HA	1.82	0.41
1:A:1371:ILE:H	1:A:1601:LYS:HG3	1.85	0.41
1:A:1373:VAL:HG22	1:A:1393:TRP:CD1	2.56	0.41
1:A:2205:VAL:HG21	1:A:2280:VAL:HG11	2.02	0.41
1:A:1569:LEU:CD2	1:A:1570:PRO:HD3	2.49	0.41
1:A:1847:ARG:HD3	1:A:1849:THR:H	1.85	0.41
1:A:2517:LEU:HD23	1:A:2517:LEU:HA	1.94	0.41
1:A:1500:LEU:HA	1:A:1503:THR:HG22	2.02	0.41
1:A:1606:ILE:O	1:A:1609:GLN:HB2	2.21	0.40
1:A:2152:VAL:HG21	1:A:2169:LEU:HB3	2.02	0.40
1:A:2434:ILE:HG22	1:A:2434:ILE:O	2.21	0.40
1:A:2461:ALA:HB3	1:A:2469:VAL:HG23	2.03	0.40
1:A:1692:ILE:CG2	1:A:1813:LEU:HD12	2.50	0.40
1:A:1472:GLU:O	1:A:1472:GLU:HG2	2.21	0.40
1:A:1739:TYR:HE2	1:A:1747:TYR:HB2	1.85	0.40
1:A:2003:PHE:CE2	1:A:2014:LYS:HE3	2.57	0.40
1:A:2499:ASN:OD1	1:A:2502:HIS:HB2	2.21	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1335:MET:HG2	1:A:1412:ARG:HG3	2.04	0.40
1:A:1814:TYR:CB	1:A:1855:ILE:HD12	2.51	0.40
1:A:1992:TYR:CE2	1:A:1995:LEU:HD13	2.57	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	987/2527 (39%)	908 (92%)	79 (8%)	0	100	100
2	B	98/131 (75%)	90 (92%)	8 (8%)	0	100	100
All	All	1085/2658 (41%)	998 (92%)	87 (8%)	0	100	100

There are no Ramachandran outliers to report.

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	912/2281 (40%)	912 (100%)	0	100	100
2	B	79/106 (74%)	79 (100%)	0	100	100
All	All	991/2387 (42%)	991 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1352	GLN
1	A	1437	ASN
1	A	1561	GLN
1	A	1741	ASN
1	A	1879	GLN
1	A	1919	GLN
1	A	2420	GLN
1	A	2476	ASN
2	B	38	ASN
2	B	104	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

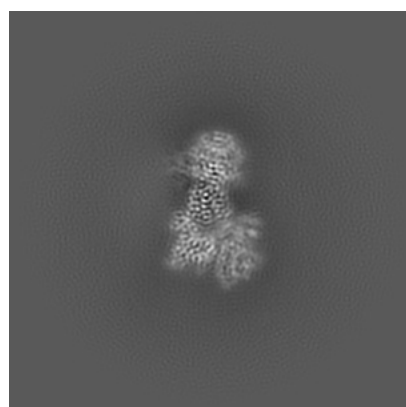
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-73338. These allow visual inspection of the internal detail of the map and identification of artifacts.

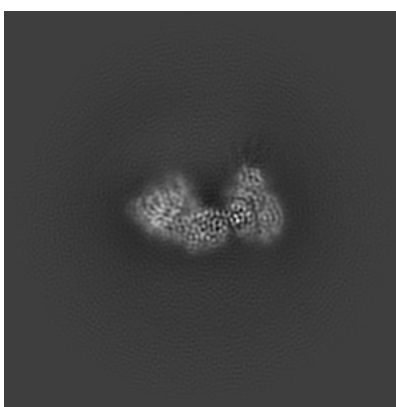
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

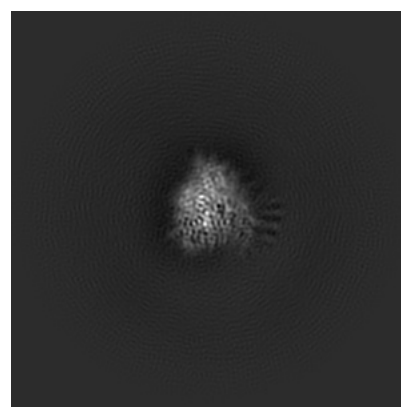
6.1.1 Primary map



X



Y

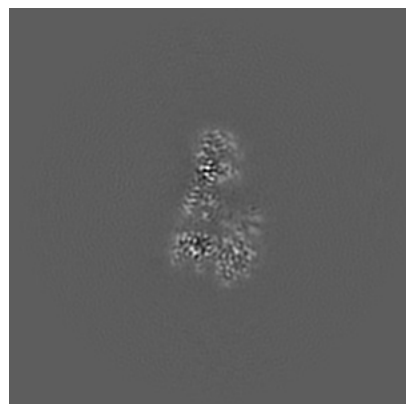


Z

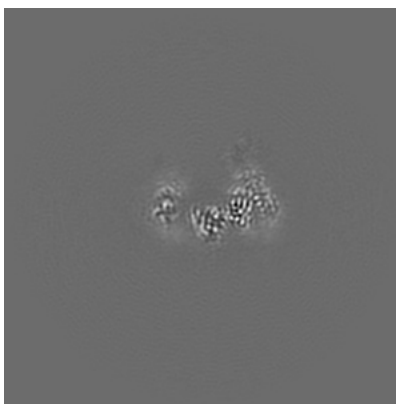
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

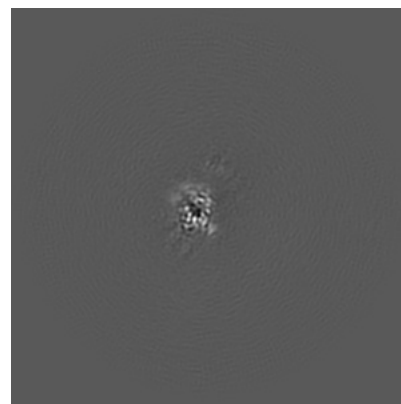
6.2.1 Primary map



X Index: 144



Y Index: 144

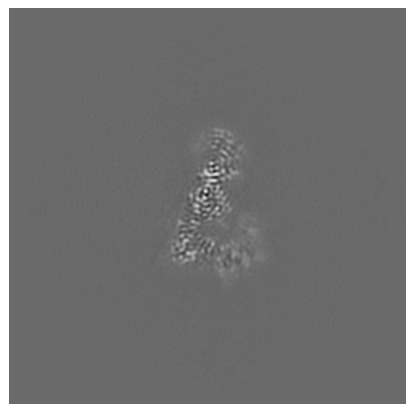


Z Index: 144

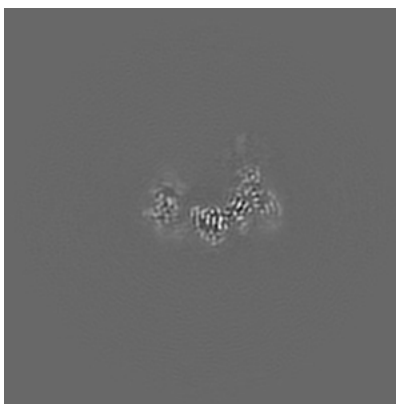
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

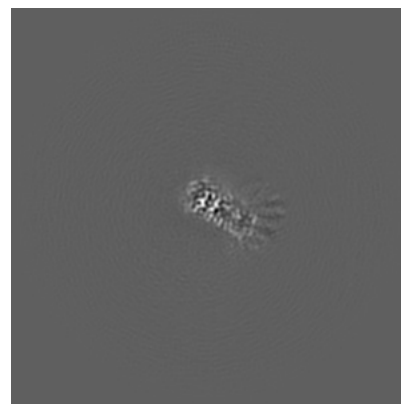
6.3.1 Primary map



X Index: 136



Y Index: 141

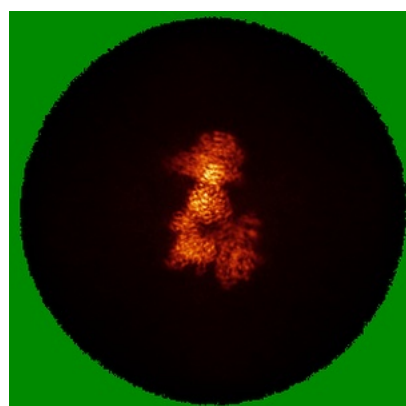


Z Index: 172

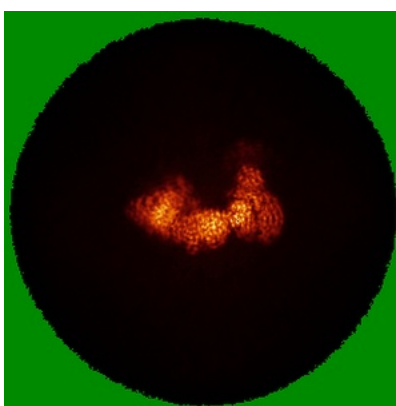
The images above show the largest variance slices of the map in three orthogonal directions.

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

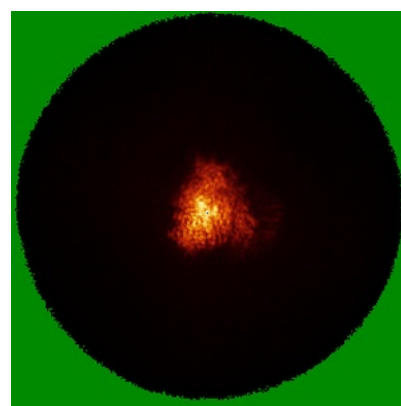
6.4.1 Primary map



X



Y

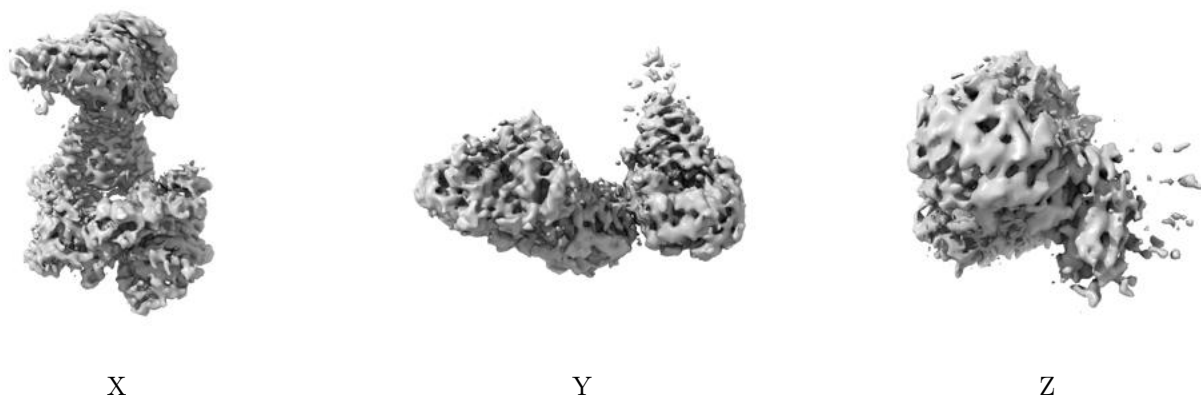


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 5.14. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

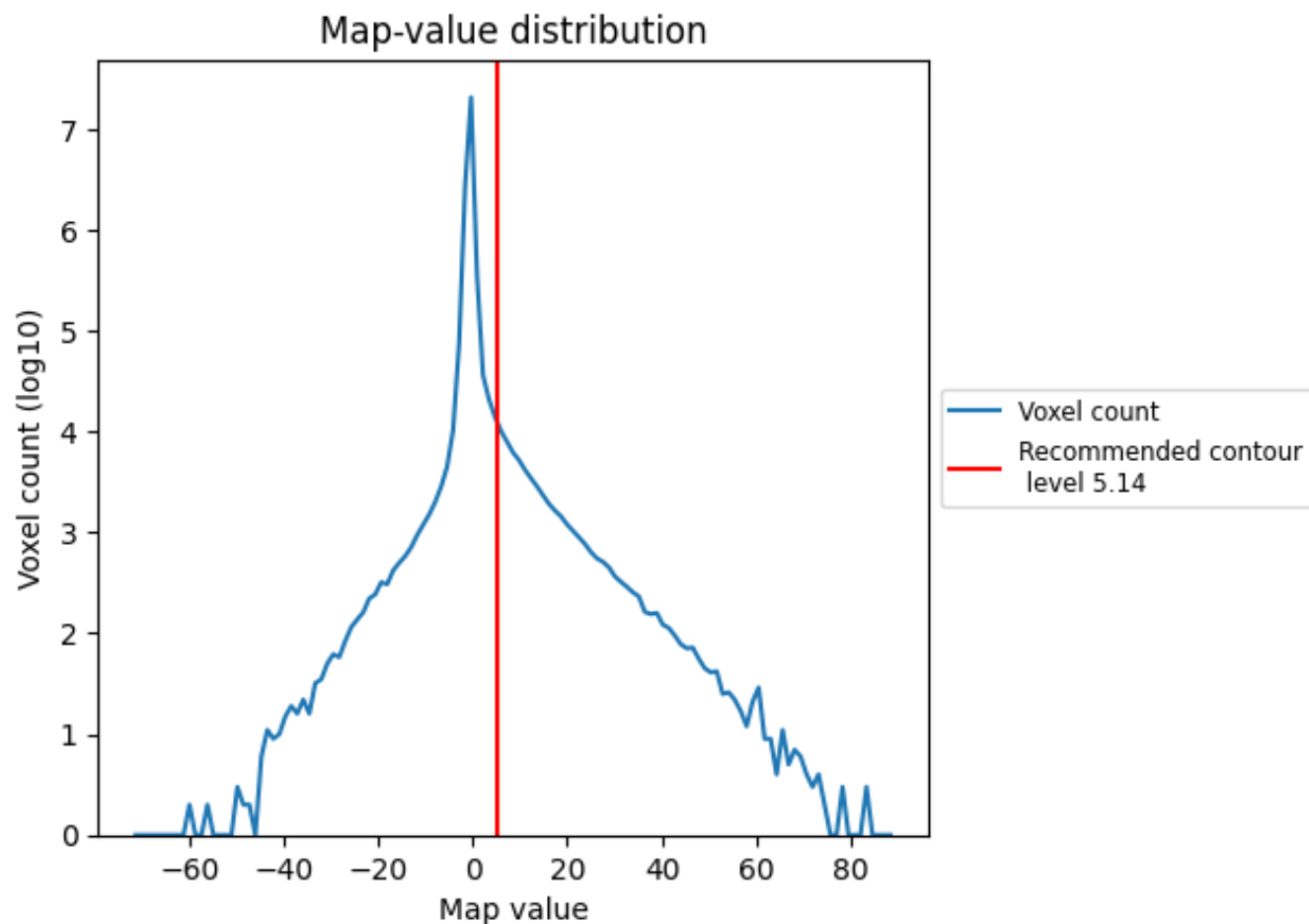
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

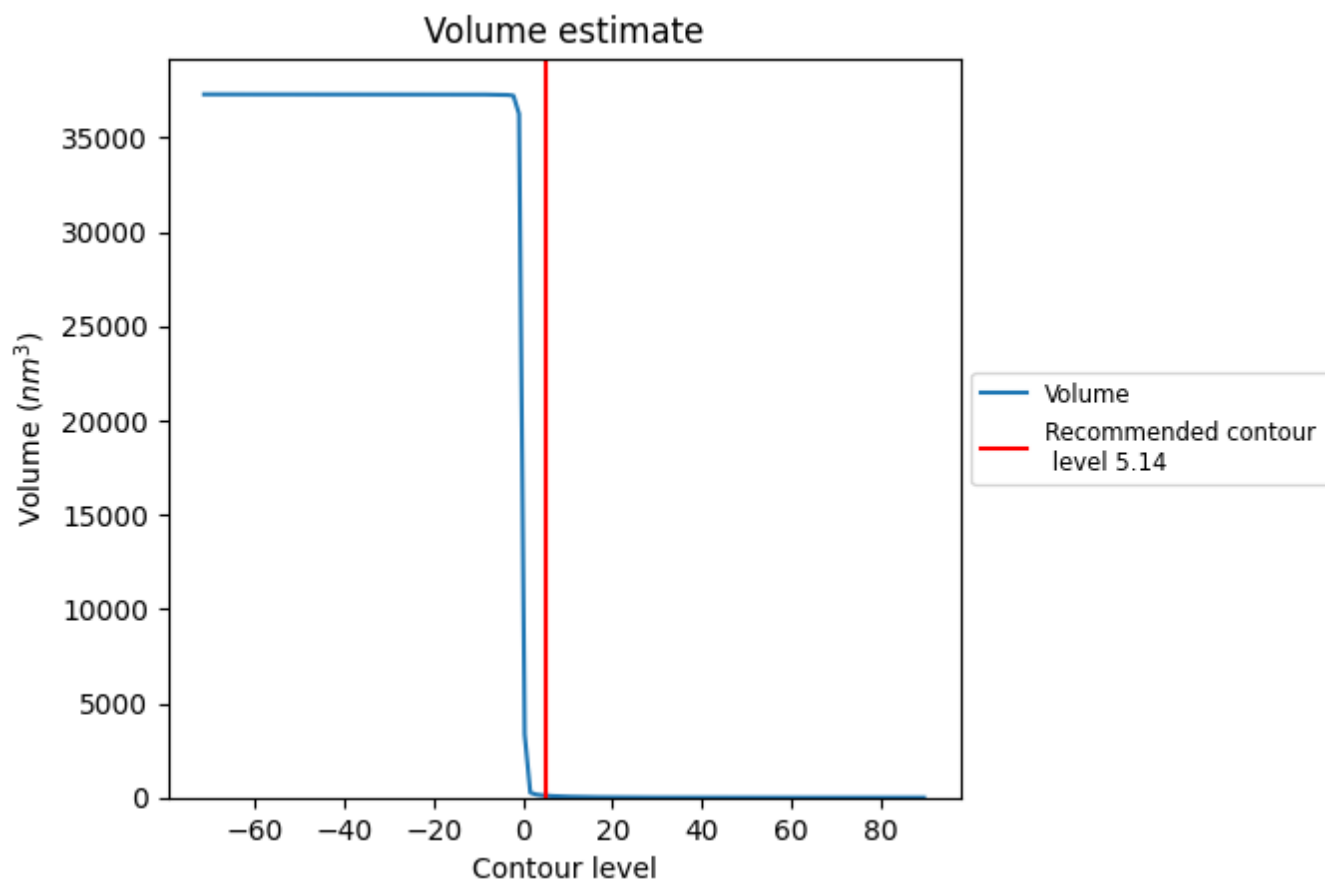
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

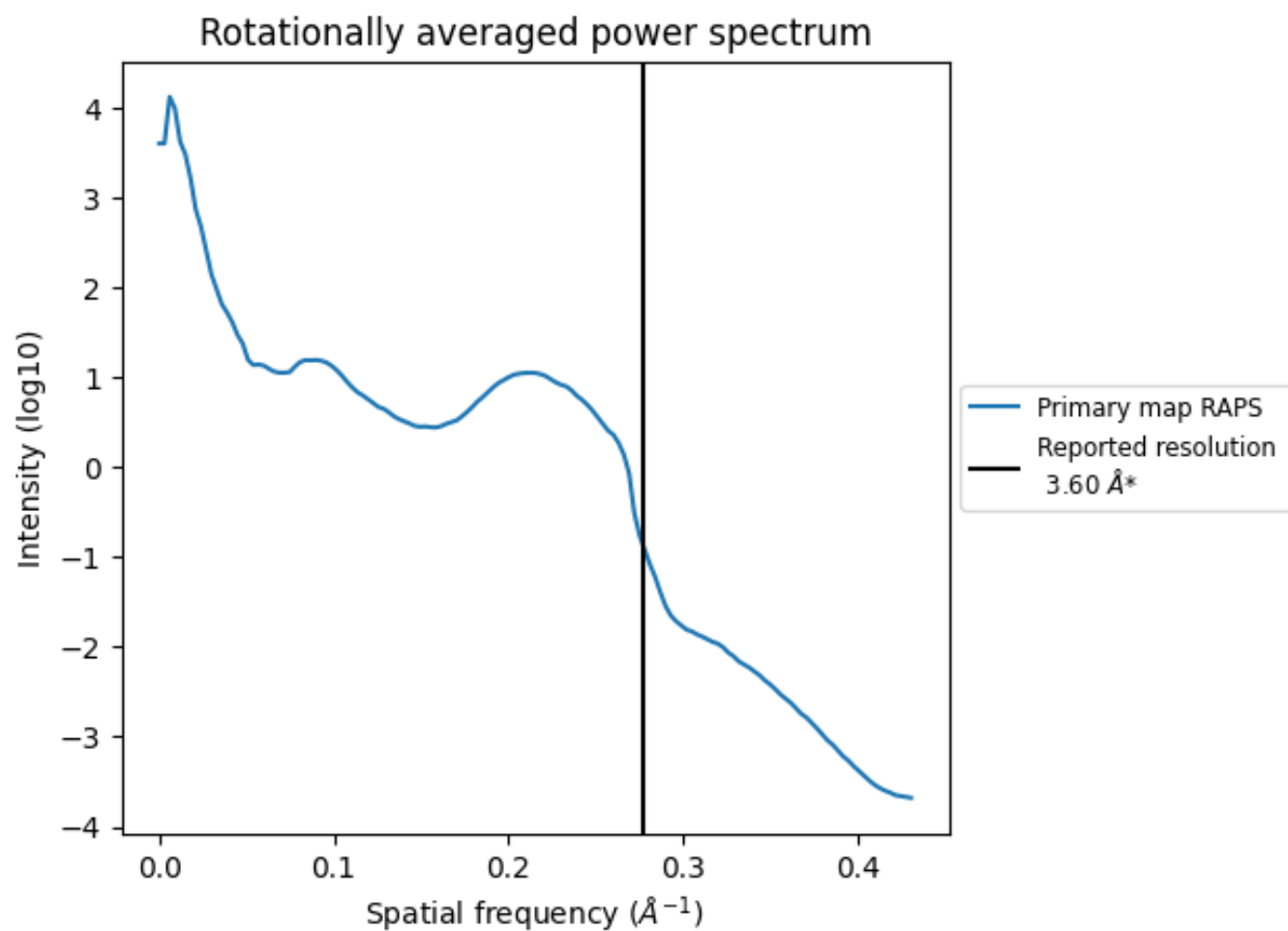
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 102 nm³; this corresponds to an approximate mass of 92 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 0.278 $\text{\AA}^{-1}$

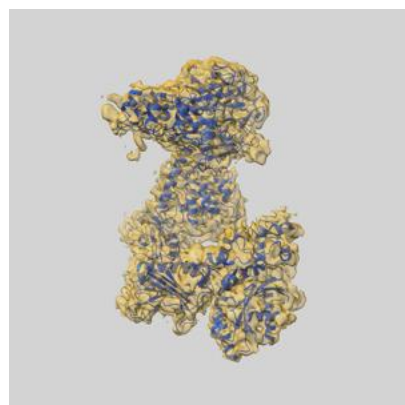
8 Fourier-Shell correlation ⓘ

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

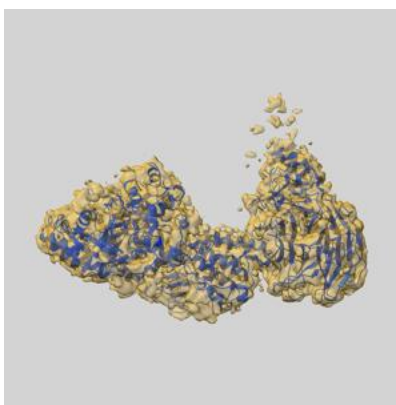
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-73338 and PDB model 9YQK. Per-residue inclusion information can be found in [section 3](#) on [page 4](#).

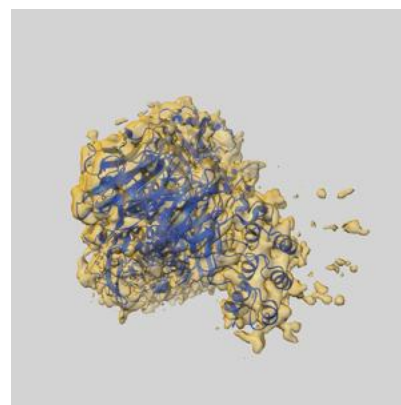
9.1 Map-model overlay [i](#)



X



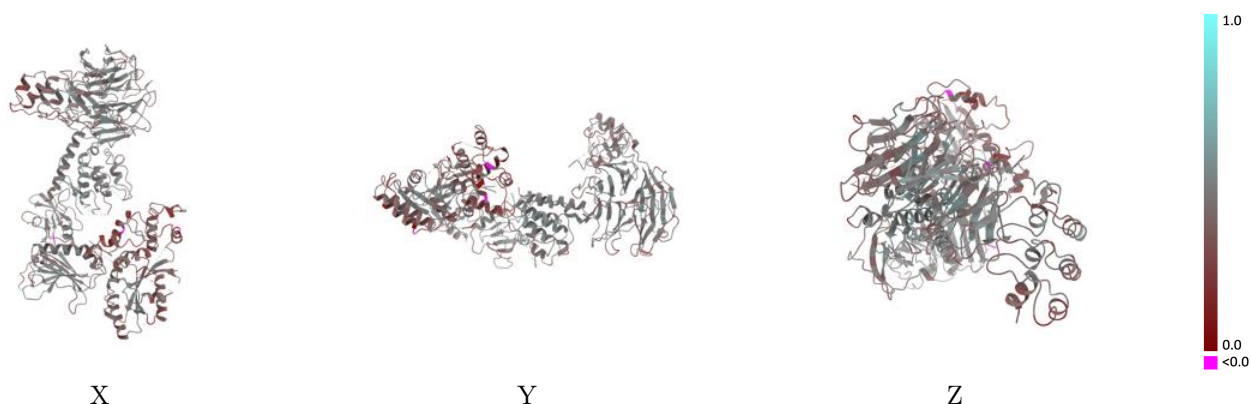
Y



Z

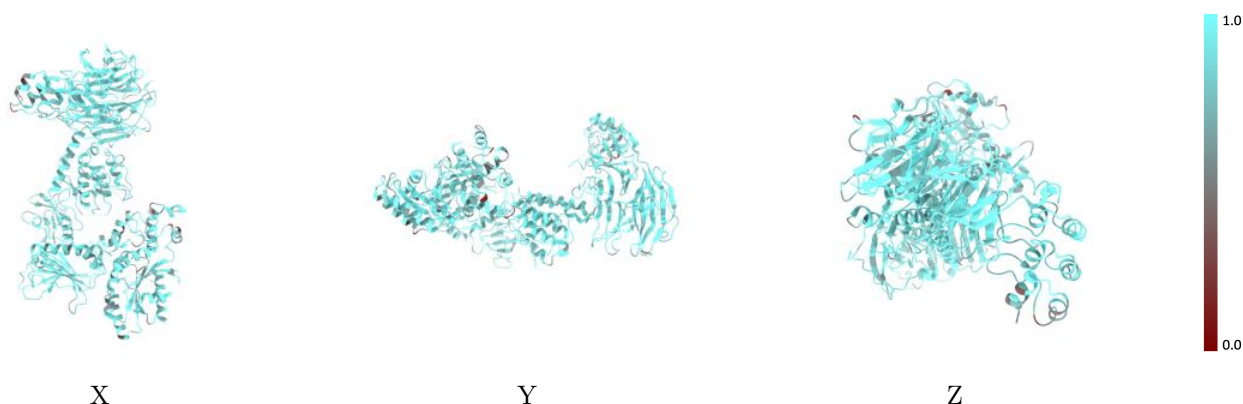
The images above show the 3D surface view of the map at the recommended contour level 5.14 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



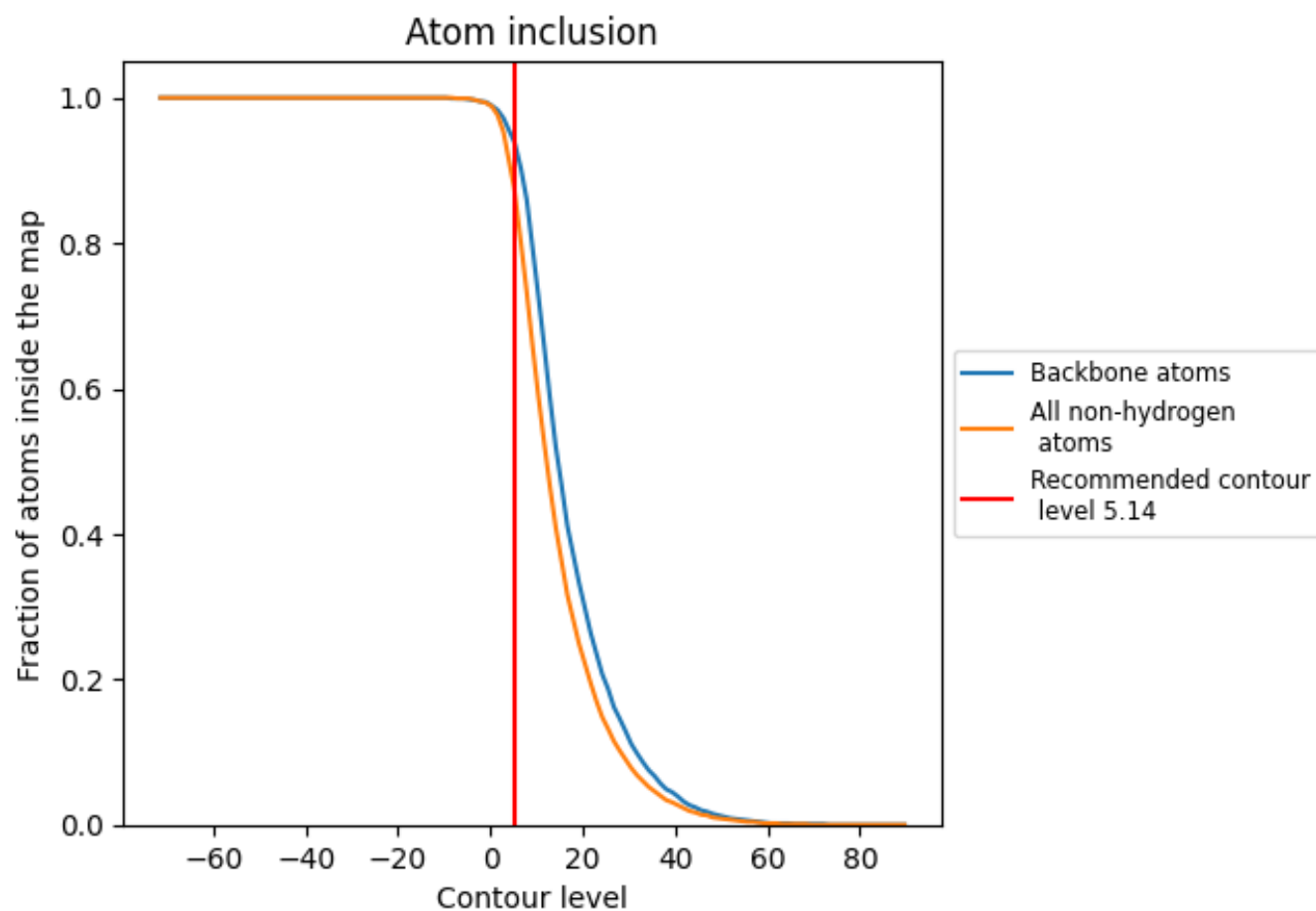
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



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 (5.14).

9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 88% 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 (5.14) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8770	0.4120
A	0.8820	0.4150
B	0.8260	0.3800

