



wwPDB EM Validation Summary Report ⓘ

Nov 8, 2023 – 05:06 AM EST

PDB ID : 8FCY
EMDB ID : EMD-28999
Title : Engineered human dynein motor domain in microtubule-bound state
Authors : Ton, W.; Wang, Y.; Chai, P.
Deposited on : 2022-12-01
Resolution : 3.40 Å(reported)

This is a wwPDB EM Validation Summary 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.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

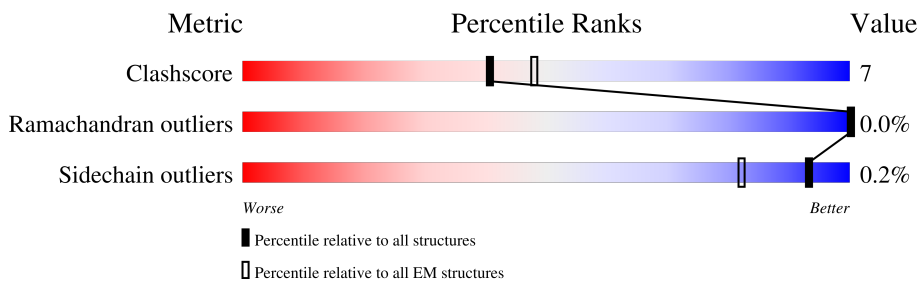
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	3130	

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 23142 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.

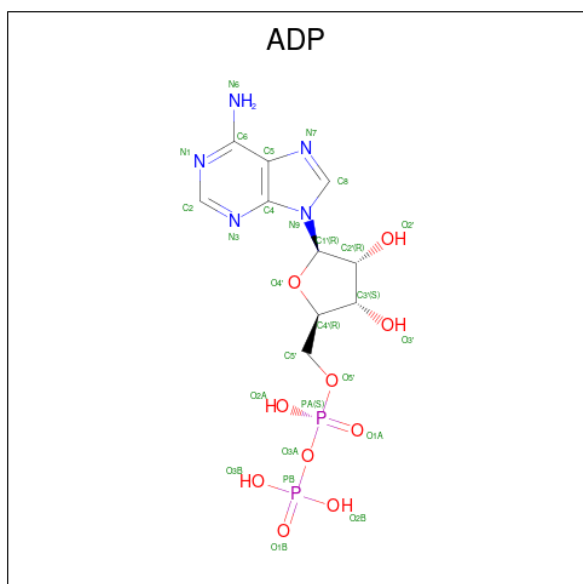
- Molecule 1 is a protein called Cytoplasmic dynein 1 heavy chain 1, Serine-tRNA ligase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2864	23030	14683	3976	4255	116	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	expression tag	UNP Q14204
A	2	SER	-	expression tag	UNP Q14204
A	3129	GLU	-	expression tag	UNP Q14204
A	3130	PHE	-	expression tag	UNP Q14204

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



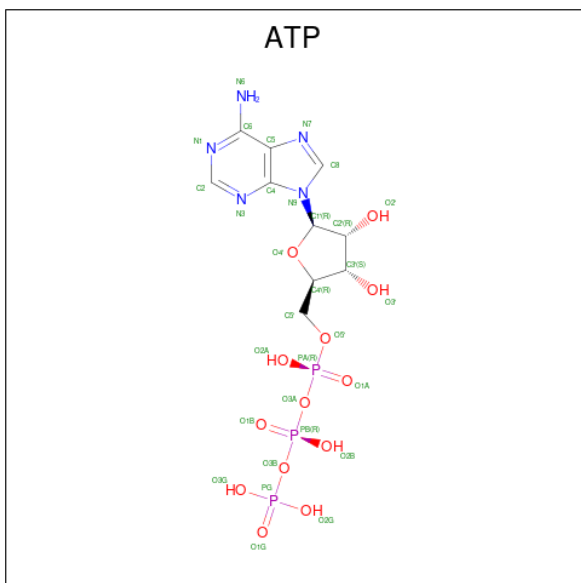
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0

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Mol	Chain	Residues	Atoms				AltConf	
2	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
2	A	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).

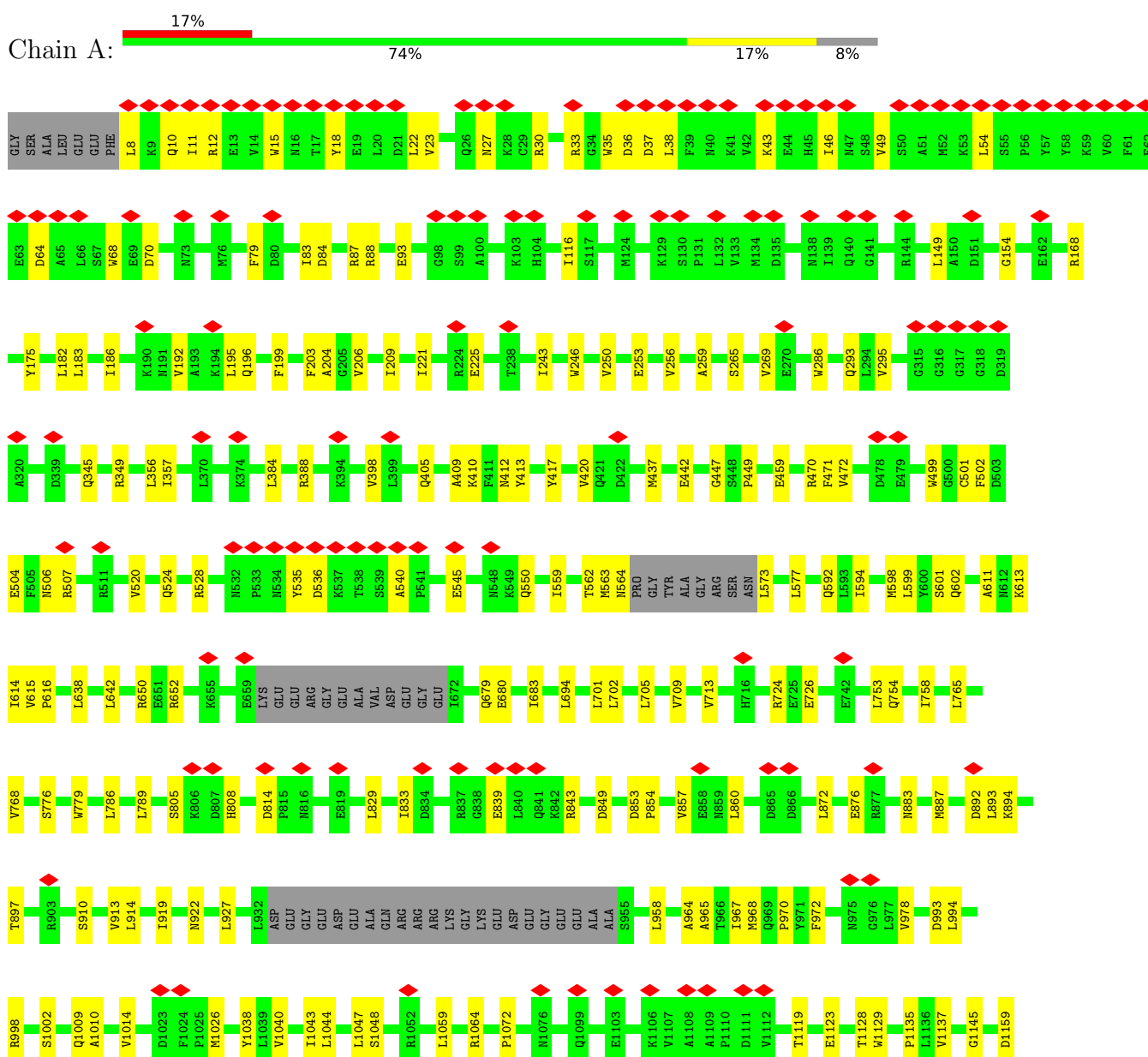


Mol	Chain	Residues	Atoms				AltConf	
3	A	1	Total	C	N	O	P	0
			31	10	5	13	3	

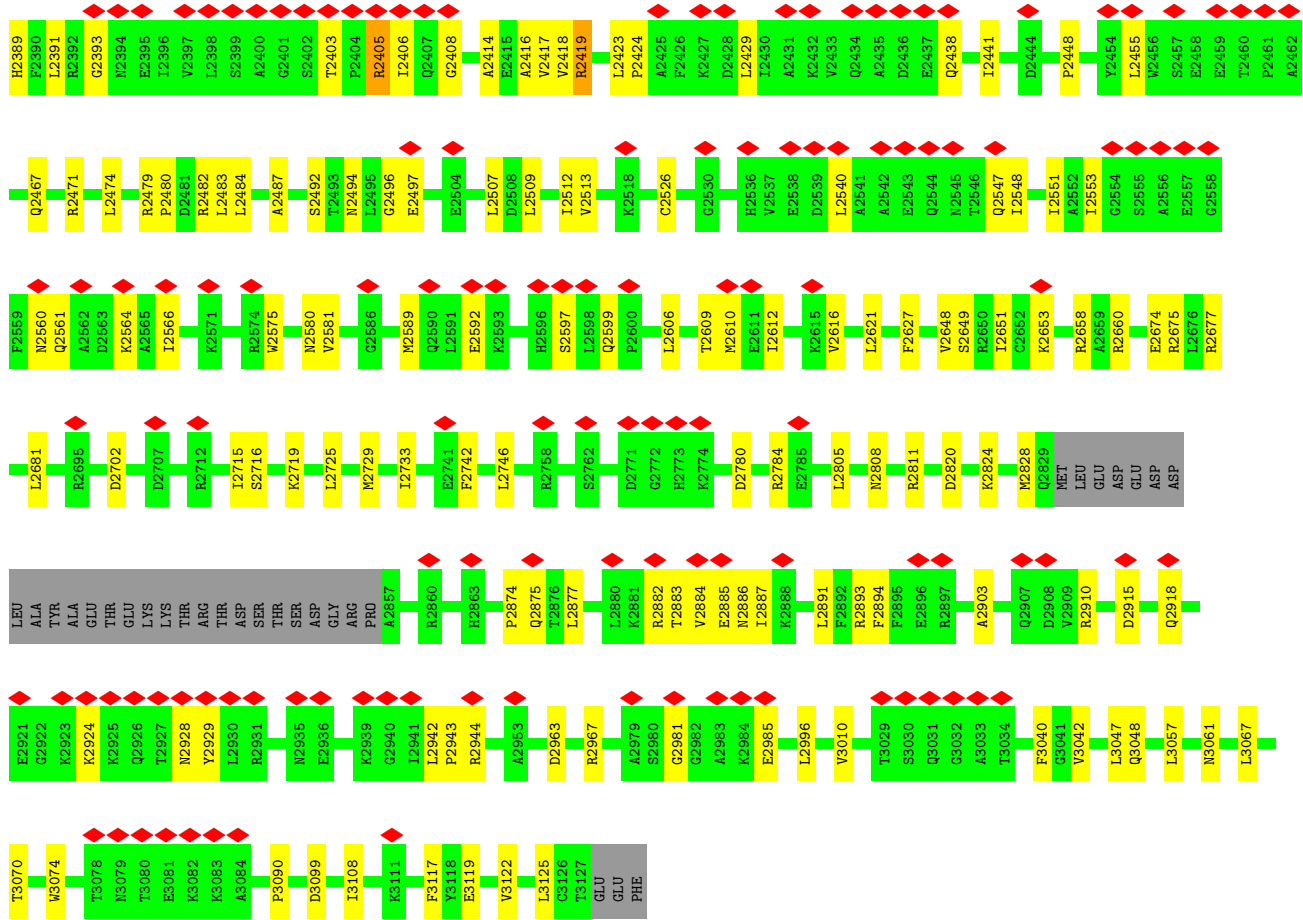
3 Residue-property plots

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: Cytoplasmic dynein 1 heavy chain 1, Serine-tRNA ligase



T2249	T2250	T2251	L2252	E2253	N2254	L2255	K2256	E2257	E2258	A2259	A2260	E2261	K2264	K2265	V2266	E2267	E2268	T2269	D2270	E2277	T2278	V2279	S2280	Q2281	S2299	L2306	Y2307	V2321	K2328	K2339	G2330	R2337	L2345	R2355	G2356	N2357	L2358	H2359	A2370	R2371	G2376	T2377	V2378	G2379	D2384	Q2388							
P2155	T2163	R2164	D2165	P2166	T2167	D2173	S2176	R2177	V2178	V2181	T2186	L2190	L2199	K2200	S2205	V2206	D2207	L2216	Q2217	G2218	E2219	F2220	Q2221	L2222	R2223	L2224	R2225	Q2226	L2227	E2228	K2229	S2230	L2231	R2232	Q2233	A2234	L2235	N2236	E2237	V2238	K2239	G2240	R2241	L2242	L2243	D2244	D2245	D2246	T2247	T2248			
G2076	Q2077	A2078	T2079	E2080	F2081	I2082	M2083	N2084	E2085	Y2086	K2087	D2088	R2089	K2090	R2093	L2097	D2098	D2099	A2100	F2101	R2102	E2106	S2107	A2108	L2109	F2110	G2111	G2112	V2120	N2128	N2132	R2133	E2134	V2135	R2136	R2137	T2138	G2139	G2140	R2141	V2142	L2143	I2144	T2145	L2146	G2147	D2148	Q2149	D2150	L2151	D2152	L2153	S2154
S1965	A1966	E1967	R1968	E1969	R1970	W1971	E1972	K1973	E1976	T1977	F1978	R1979	M1980	Q1981	M1982	S1983	T1984	I1985	I1996	F2002	D2003	M2006	L2018	T2023	R2026	R2031	L2035	E2040	R2041	L2042	R2043	W2044	Q2045	A2046	S2047	S2048	L2049	E2057	T2060	M2061	L2062	Y2068	F2069	L2070	S2075								
ALA	LYS	ASP	ASN	GLN	GLN	LYS	ALA	ASN	GLU	GLU	VAL	VAL	PRO	GLU	GLN	MET	ILE	ARG	ASP	GLU	LEU	GLU	ALA	SER	ILE	ALA	ILE	SER	GLU	ALA	ALA	LEU	VAL	GLU	GLU	VAL	ALA	V1953	V1954	N1955	R1956	S1957	T1958	A1959	L1960	L1961	K1962	S1963	L1964				
LEU	LYS	MET	VAL	LYS	ASP	GLN	LYS	GLN	GLU	GLU	ALA	GLU	GLN	GLY	GLU	GLU	TYR	GLU	GLU	ALA	ALA	GLY	GLU	VAL	ILE	ALA	LYS	LEU	GLN	ASP	GLU	GLU	ALA	GLU	VAL	ALA	LEU	LEU	VAL	GLN	ASN	GLU	GLU	GLN	GLU	GLU	GLU	VAL					
A1707	K1708	R1709	G1710	G1711	R1712	T1717	H1718	H1719	R1720	H1721	L1722	A1729	E1734	K1735	M1744	H1745	L1746	M1747	V1748	G1749	L1750	D1751	K1752	I1753	K1754	E1755	T1756	V1757	D1758	Q1759	V1760	E1761	E1762	L1763	R1764	R1765	ASP	LEU	ARG	ILE	LYS	SER	GLN	GLN	GLN	GLN	GLU	VAL	VAL				
S1616	S1617	E1618	G1619	L1620	K1621	D1622	R1623	A1624	A1625	T1626	S1627	L1630	F1631	M1632	R1633	C1634	E1635	L1636	H1637	W1638	K1657	M1658	D1659	L1660	E1661	K1662	P1663	Y1665	I1666	D1669	M1670	M1671	P1672	V1673	V1674	V1675	D1676	K1677	L1678	R1679	Q1680	P1681	R1685	E1686	A1687	I1688	V1689	M1690	S1691	V1695	H1696		
M1582	D1540	E1541	S1542	M1543	V1544	L1545	D1546	S1547	G1548	F1549	L1550	A1558	M1559	G1560	E1561	L1565	F1566	E1567	G1568	D1569	E1570	Y1571	T1573	L1574	M1575	T1576	Q1577	C1578	K1579	E1580	G1581	A1582	Q1583	K1584	E1585	G1586	L1587	M1588	L1589	D1590	S1591	H1592	E1593	E1594	L1595	Y1596	K1597	T1600	R1605	M1606	T1612		
I1406	D1407	R1408	A1411	M1412	S1413	I1416	K1424	D1425	R1435	K1439	F1445	E1448	E1449	L1450	D1451	V1452	L1456	I1467	D1468	R1469	I1470	F1471	R1472	L1478	L1479	R1493	W1497	M1498	M1499	Q1505	I1506	K1507	V1508	W1509	R1510	K1511	E1514	E1515	D1518	L1521	M1522	T1523	V1524										
P1305	R1308	E1312	P1313	E1327	R1328	Q1331	D1332	W1347	V1348	R1349	L1355	R1356	P1357	L1358	L1361	P1362	V1363	E1364	G1365	L1366	I1367	R1368	I1369	W1370	A1371	A1374	L1375	Q1379	D1380	R1381	L1382	V1383	E1384	D1385	E1386	E1387	R1388	R1389	W1390	T1391	D1392	R1393	P1394	L1395	D1396	T1397	L1400	L1303	I1304				
S1168	E1174	K1178	D1181	E1185	Y1186	H1187	R1188	V1198	D1209	E1210	I1211	M1212	L1213	P1214	D1215	K1218	Y1219	G1220	R1223	F1227	H1228	R1229	Q1230	M1231	R1239	D1242	L1248	F1253	C1257	M1258	D1262	R1265	V1276	P1277	V1278	D1282	R1302	L1400	L1303	I1304													



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	44752	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	36000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.661	Depositor
Minimum map value	-0.977	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.044	Depositor
Recommended contour level	0.35	Depositor
Map size (\AA)	413.64, 413.64, 413.64	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.149, 1.149, 1.149	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, ATP

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	0.26	0/23523	0.48	0/31883

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [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	23030	0	23109	344	0
2	A	81	0	36	3	0
3	A	31	0	12	0	0
All	All	23142	0	23157	345	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 7.

The worst 5 of 345 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:1579:LYS:O	1:A:1583:GLN:NE2	2.22	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2883:THR:HG21	1:A:2886:ASN:HB2	1.73	0.70
1:A:1145:GLY:HA2	2:A:3203:ADP:H5'2	1.72	0.70
1:A:994:LEU:HD23	1:A:998:ARG:HH21	1.55	0.70
1:A:2242:ILE:O	1:A:2245:ASP:HB2	1.93	0.69

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	2852/3130 (91%)	2724 (96%)	127 (4%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1416	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	2548/2770 (92%)	2544 (100%)	4 (0%)	93 98

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	922	ASN
1	A	2405	ARG
1	A	2419	ARG
1	A	2547	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	859	ASN
1	A	1016	GLN
1	A	1297	ASN
1	A	1583	GLN
1	A	1602	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ADP	A	3201	-	24,29,29	0.94	1 (4%)	29,45,45	1.49	4 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ADP	A	3204	-	24,29,29	0.93	1 (4%)	29,45,45	1.49	4 (13%)
2	ADP	A	3203	-	24,29,29	0.95	1 (4%)	29,45,45	1.38	4 (13%)
3	ATP	A	3202	-	26,33,33	0.60	0	31,52,52	0.74	2 (6%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ADP	A	3201	-	-	3/12/32/32	0/3/3/3
2	ADP	A	3204	-	-	3/12/32/32	0/3/3/3
2	ADP	A	3203	-	-	3/12/32/32	0/3/3/3
3	ATP	A	3202	-	-	4/18/38/38	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	3203	ADP	C5-C4	2.44	1.47	1.40
2	A	3201	ADP	C5-C4	2.41	1.47	1.40
2	A	3204	ADP	C5-C4	2.39	1.47	1.40

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	3201	ADP	PA-O3A-PB	-3.96	119.24	132.83
2	A	3204	ADP	PA-O3A-PB	-3.59	120.49	132.83
2	A	3204	ADP	N3-C2-N1	-3.27	123.56	128.68
2	A	3203	ADP	C3'-C2'-C1'	3.25	105.87	100.98
2	A	3204	ADP	C3'-C2'-C1'	3.24	105.85	100.98

There are no chirality outliers.

5 of 13 torsion outliers are listed below:

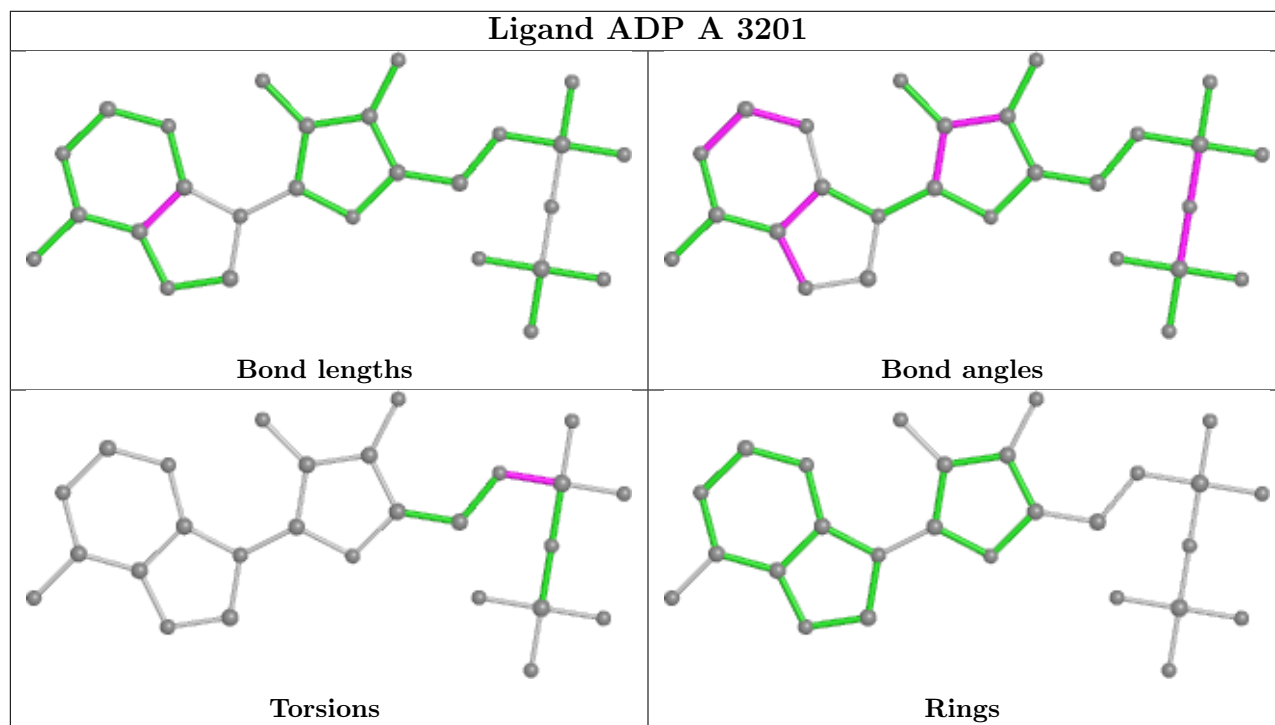
Mol	Chain	Res	Type	Atoms
2	A	3201	ADP	C5'-O5'-PA-O1A
2	A	3201	ADP	C5'-O5'-PA-O2A
2	A	3203	ADP	PA-O3A-PB-O2B
3	A	3202	ATP	C5'-O5'-PA-O1A
3	A	3202	ATP	C5'-O5'-PA-O2A

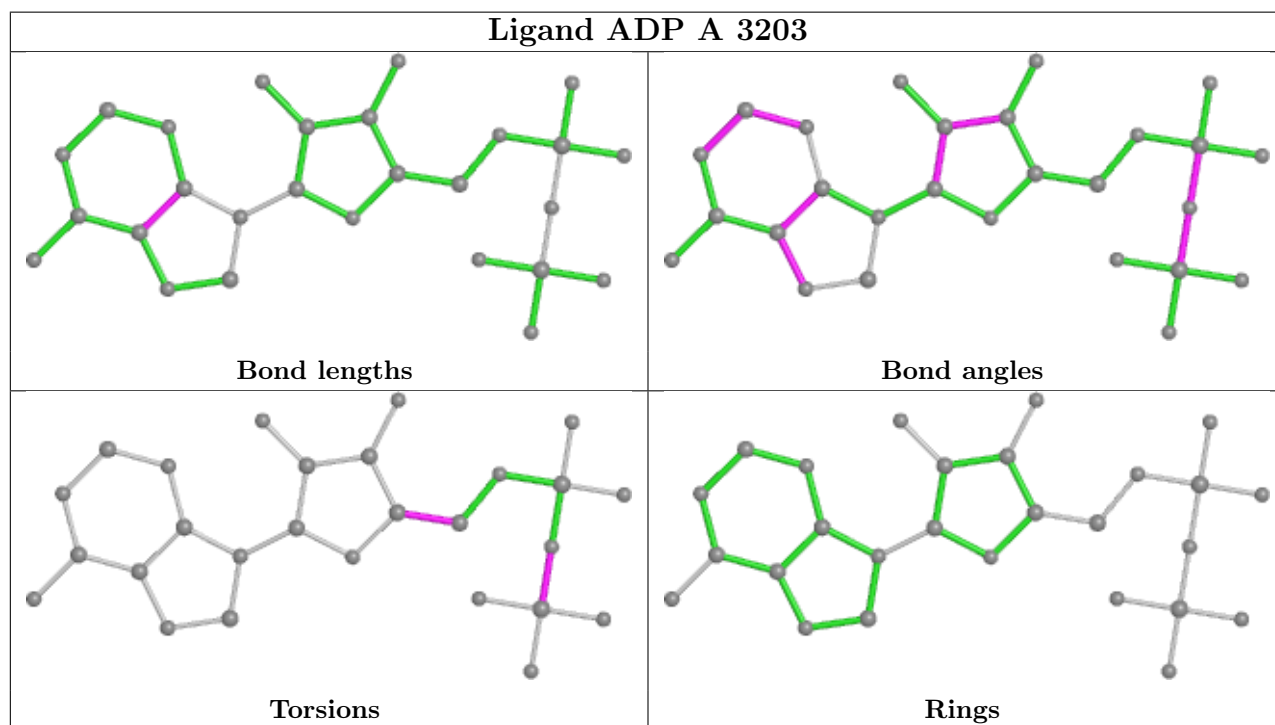
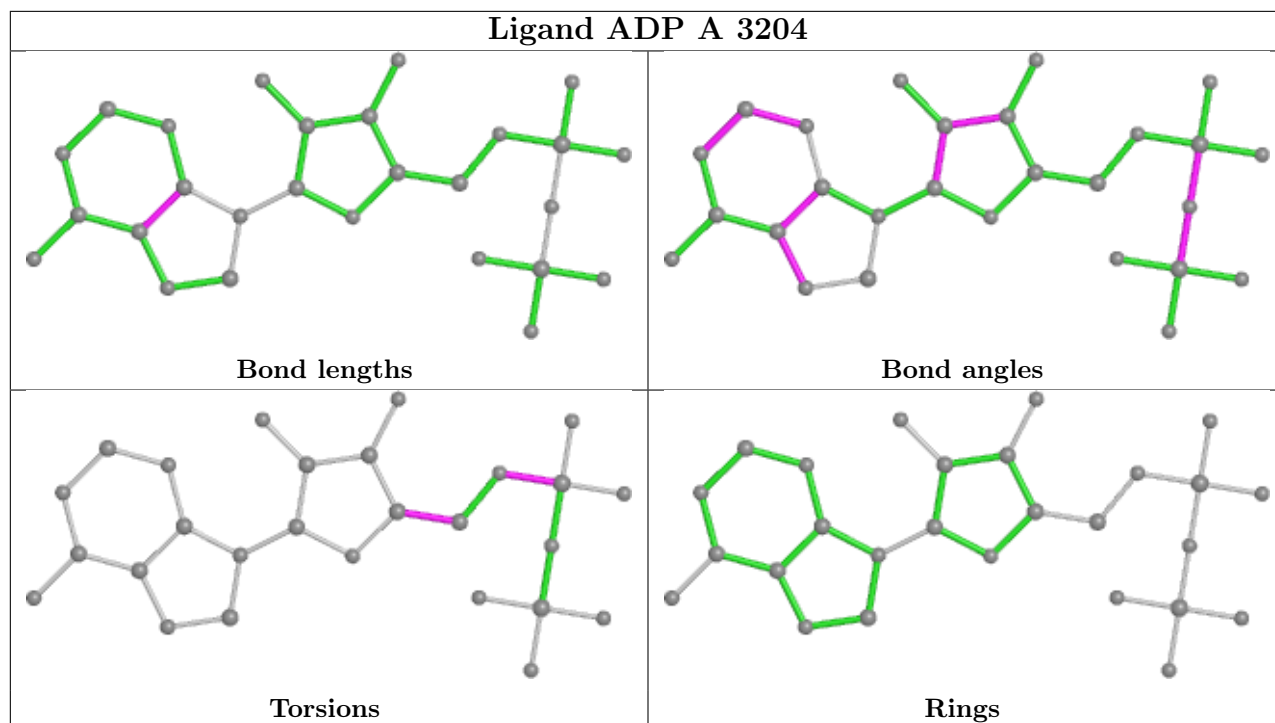
There are no ring outliers.

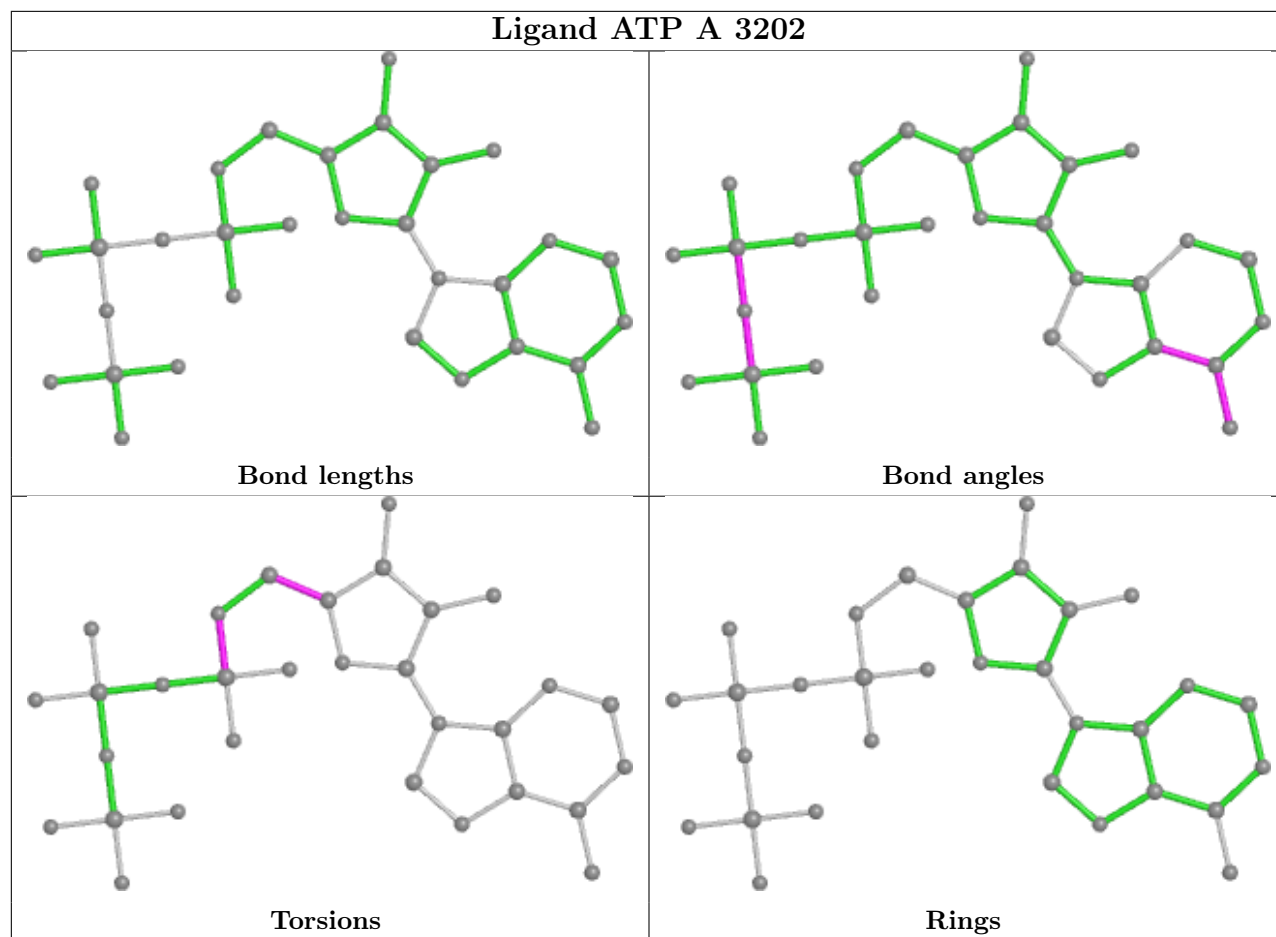
2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	3201	ADP	1	0
2	A	3203	ADP	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







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.

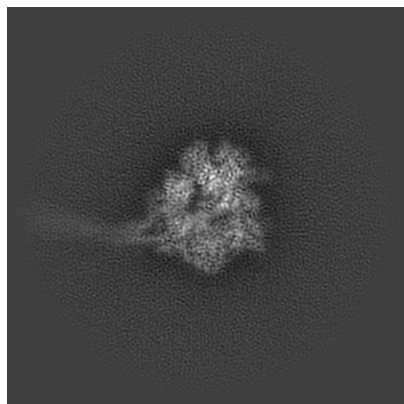
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-28999. These allow visual inspection of the internal detail of the map and identification of artifacts.

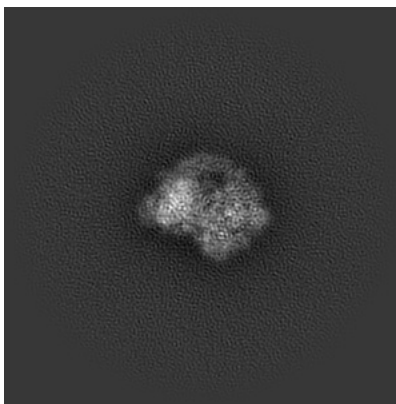
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

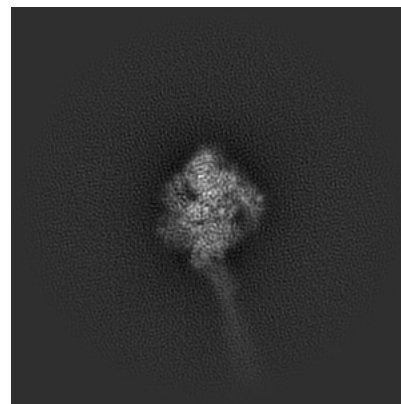
6.1.1 Primary map



X

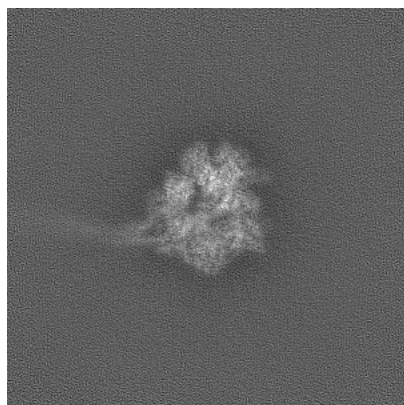


Y

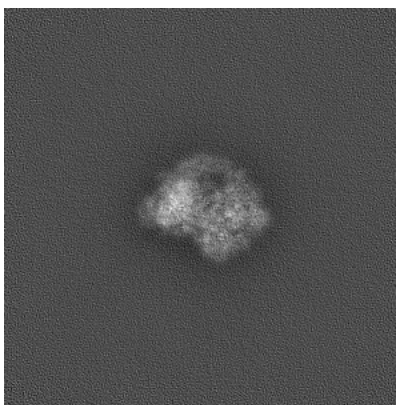


Z

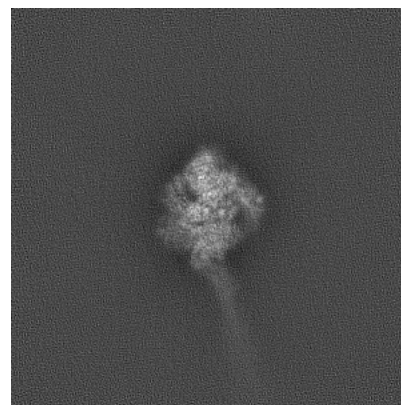
6.1.2 Raw map



X



Y

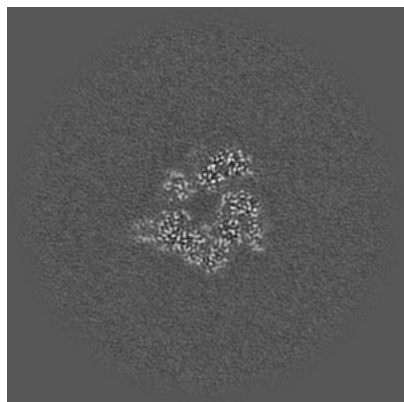


Z

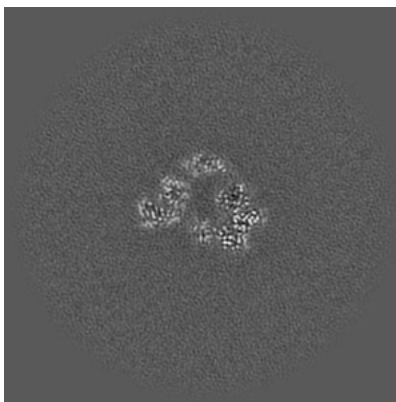
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 180

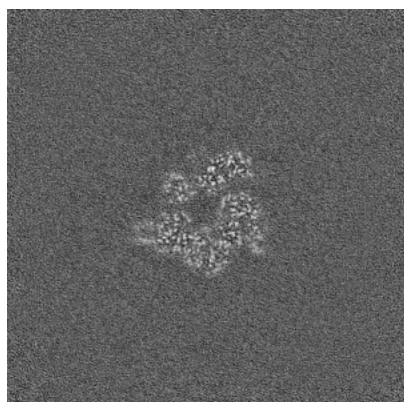


Y Index: 180

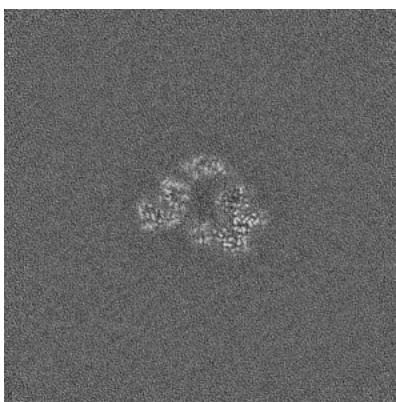


Z Index: 180

6.2.2 Raw map



X Index: 180



Y Index: 180

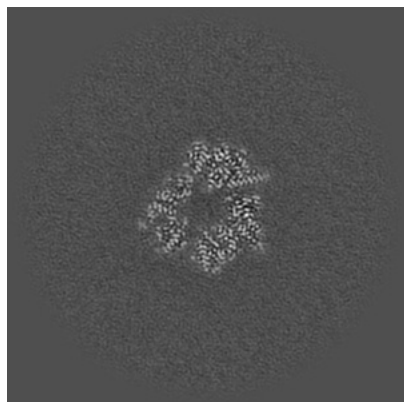


Z Index: 180

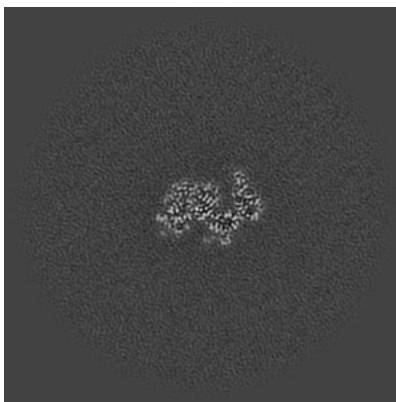
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

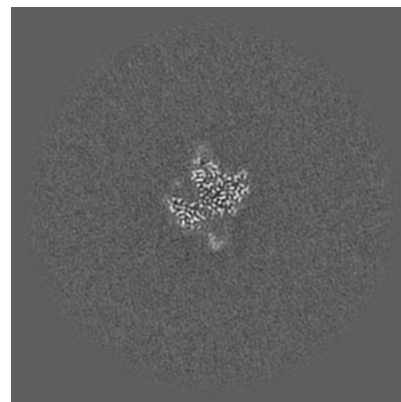
6.3.1 Primary map



X Index: 174

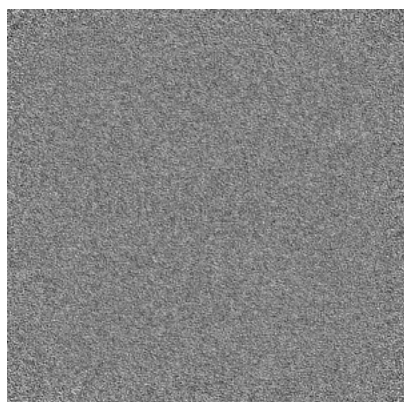


Y Index: 207

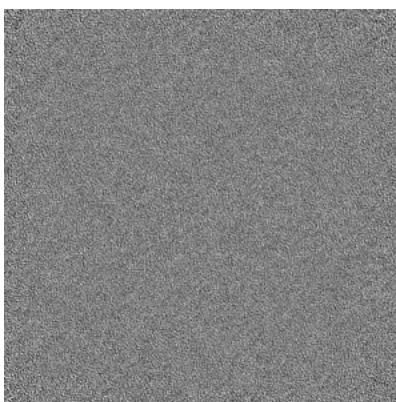


Z Index: 210

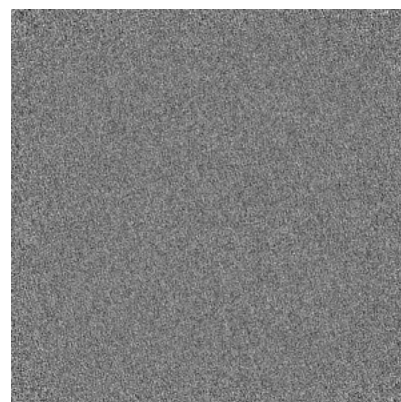
6.3.2 Raw map



X Index: 0



Y Index: 0

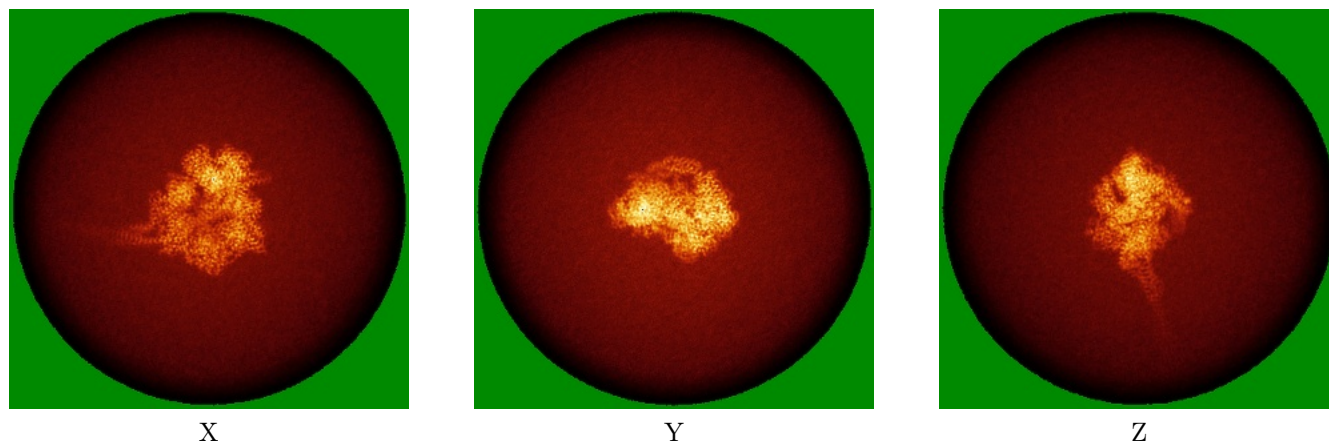


Z Index: 0

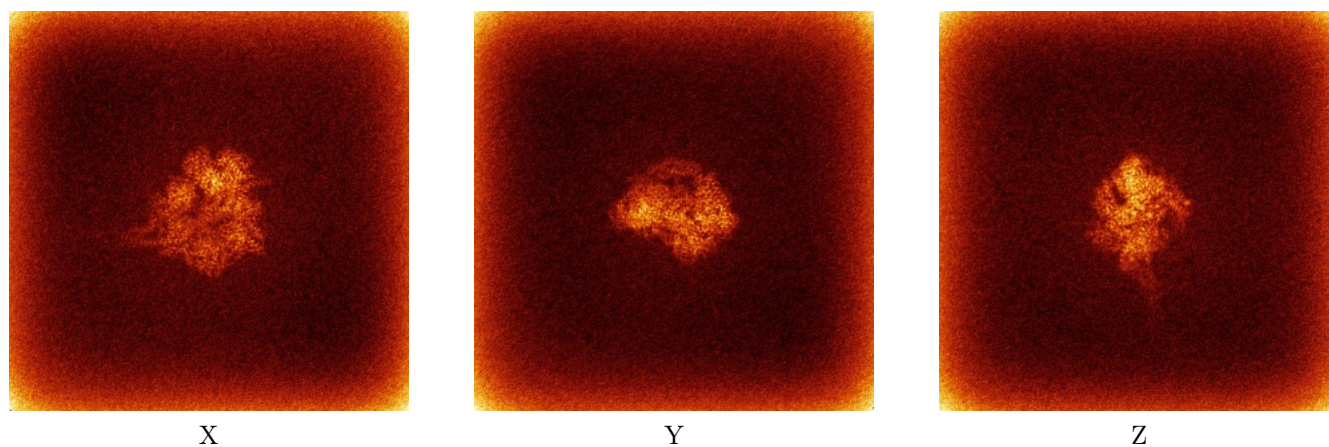
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



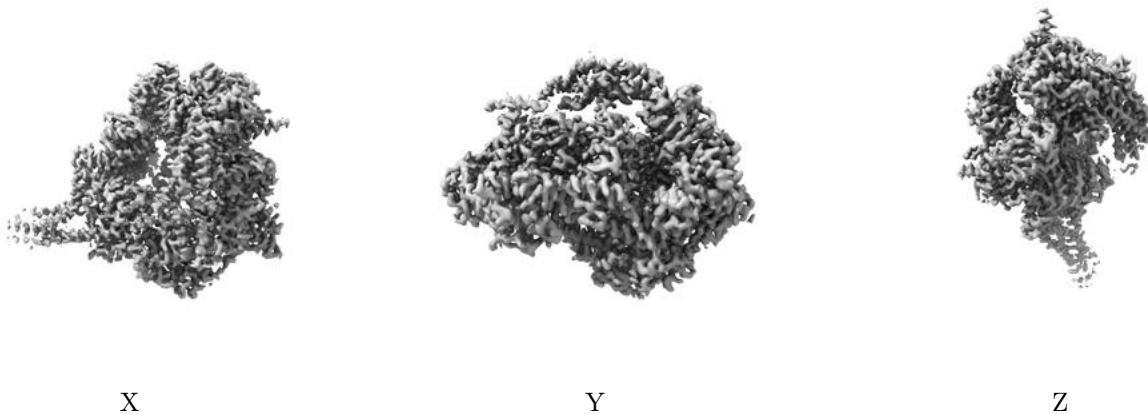
6.4.2 Raw map



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.

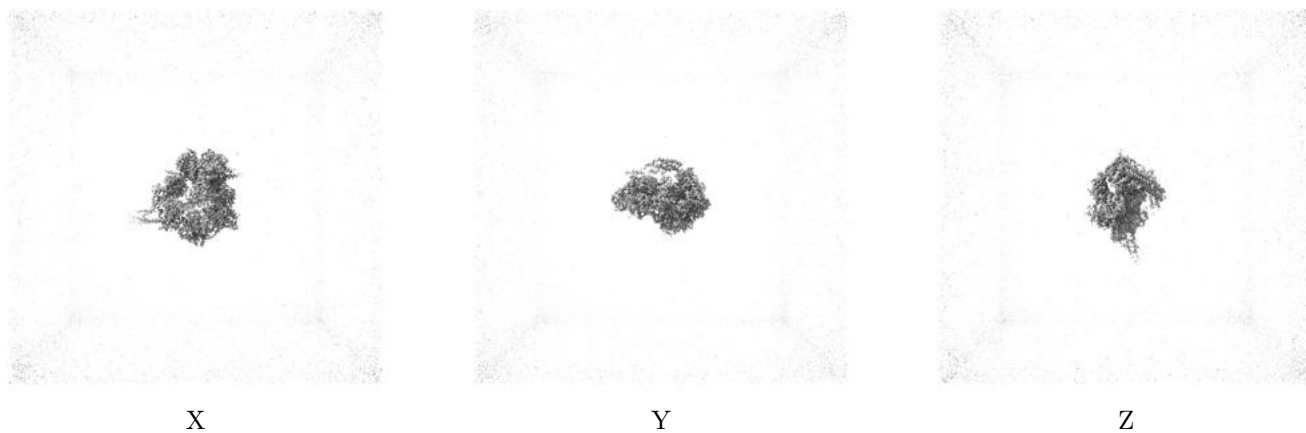
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.35. 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



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.

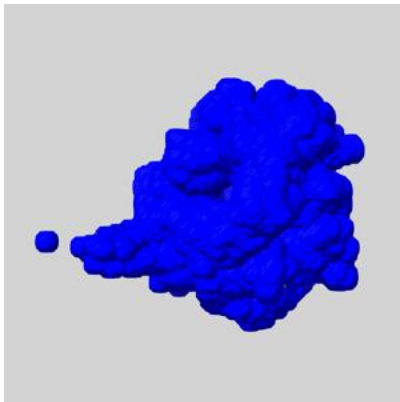
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

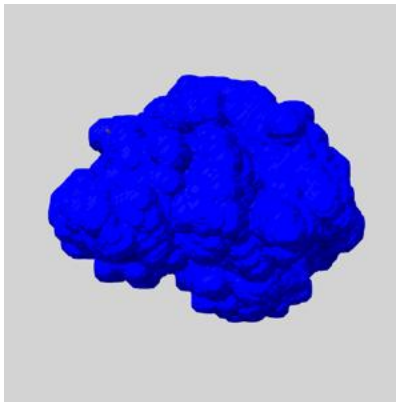
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

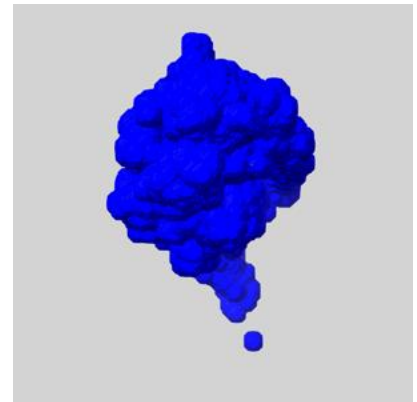
6.6.1 emd_28999_msk_1.map [i](#)



X



Y

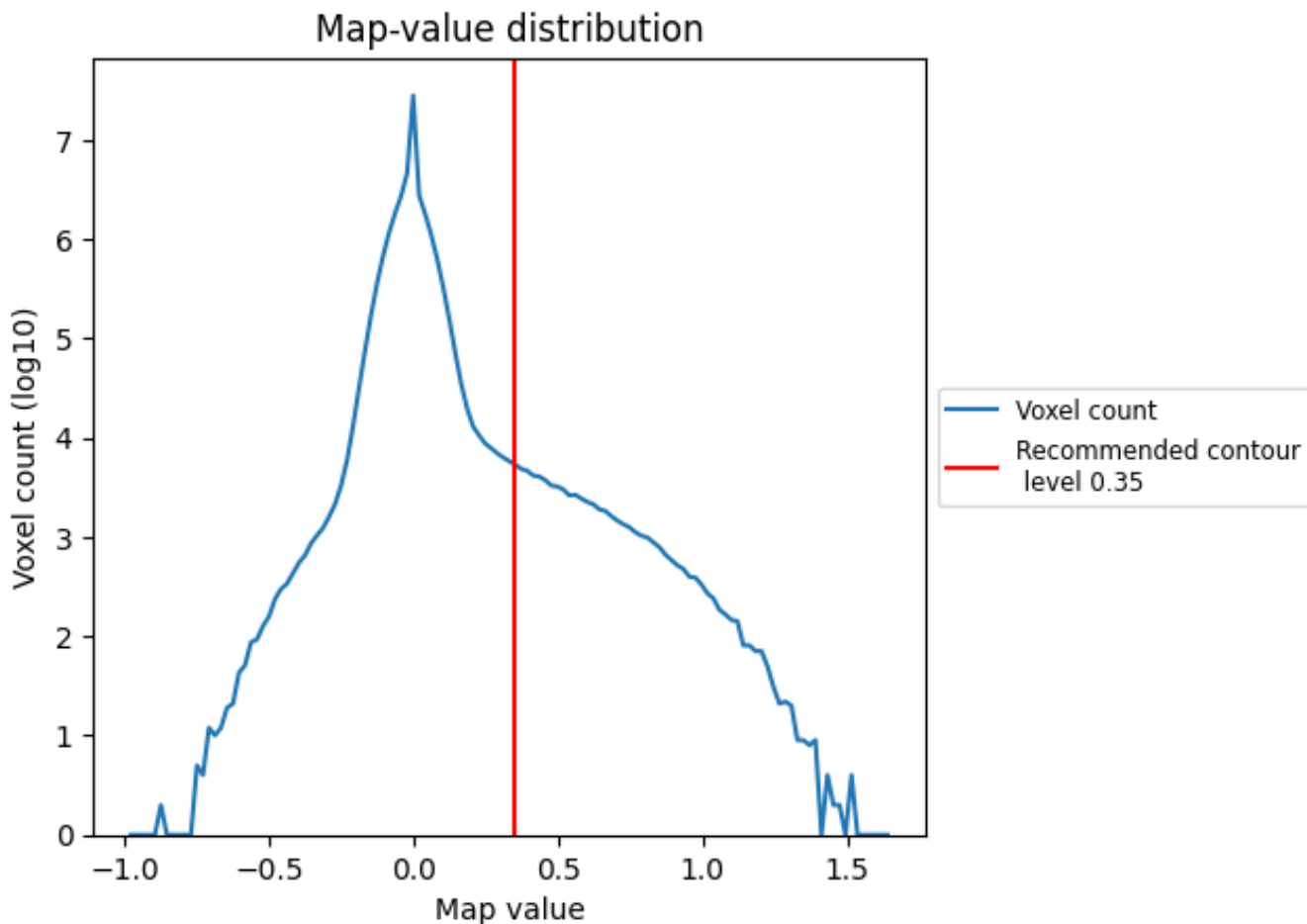


Z

7 Map analysis [i](#)

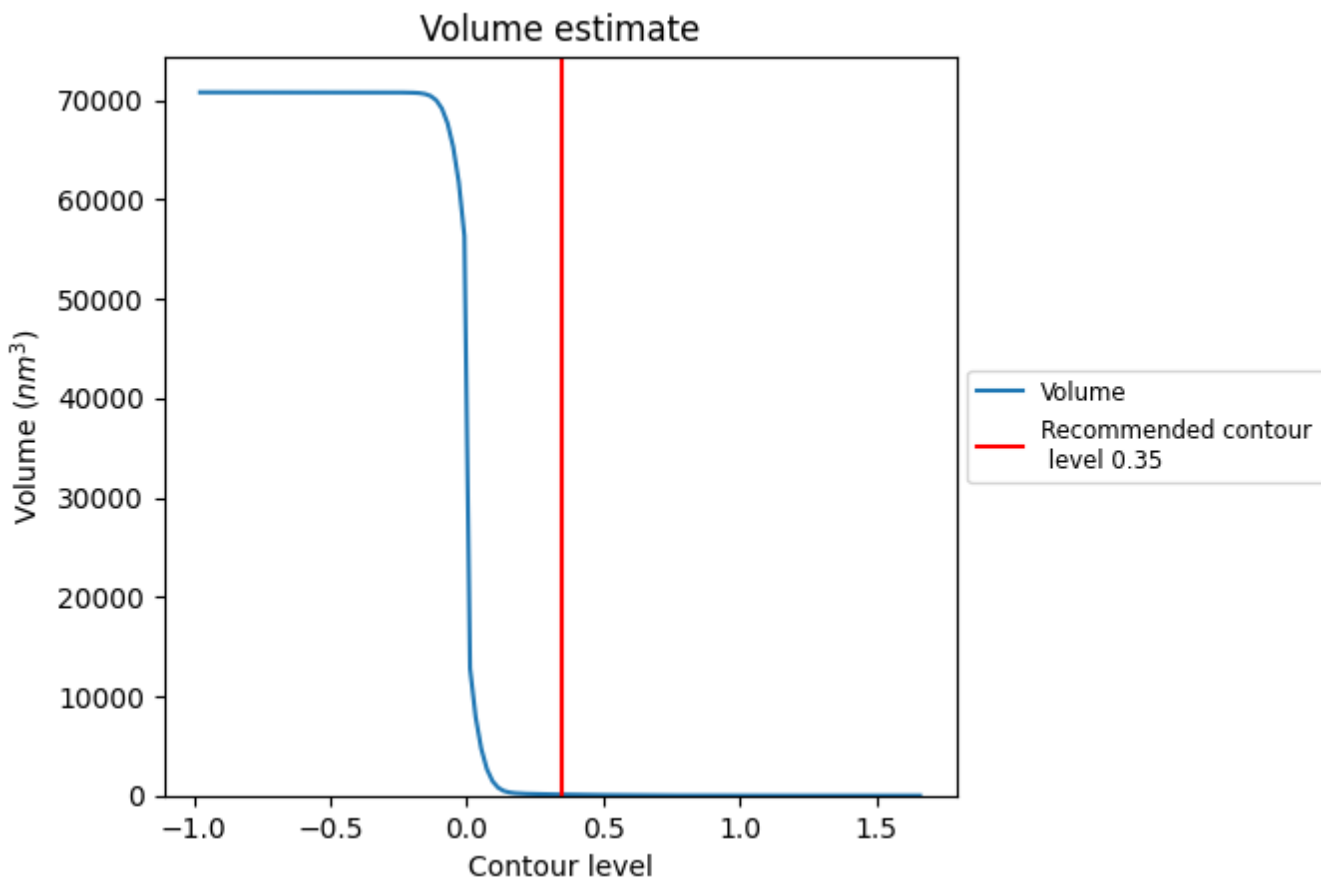
This section contains the results of statistical analysis of the map.

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.

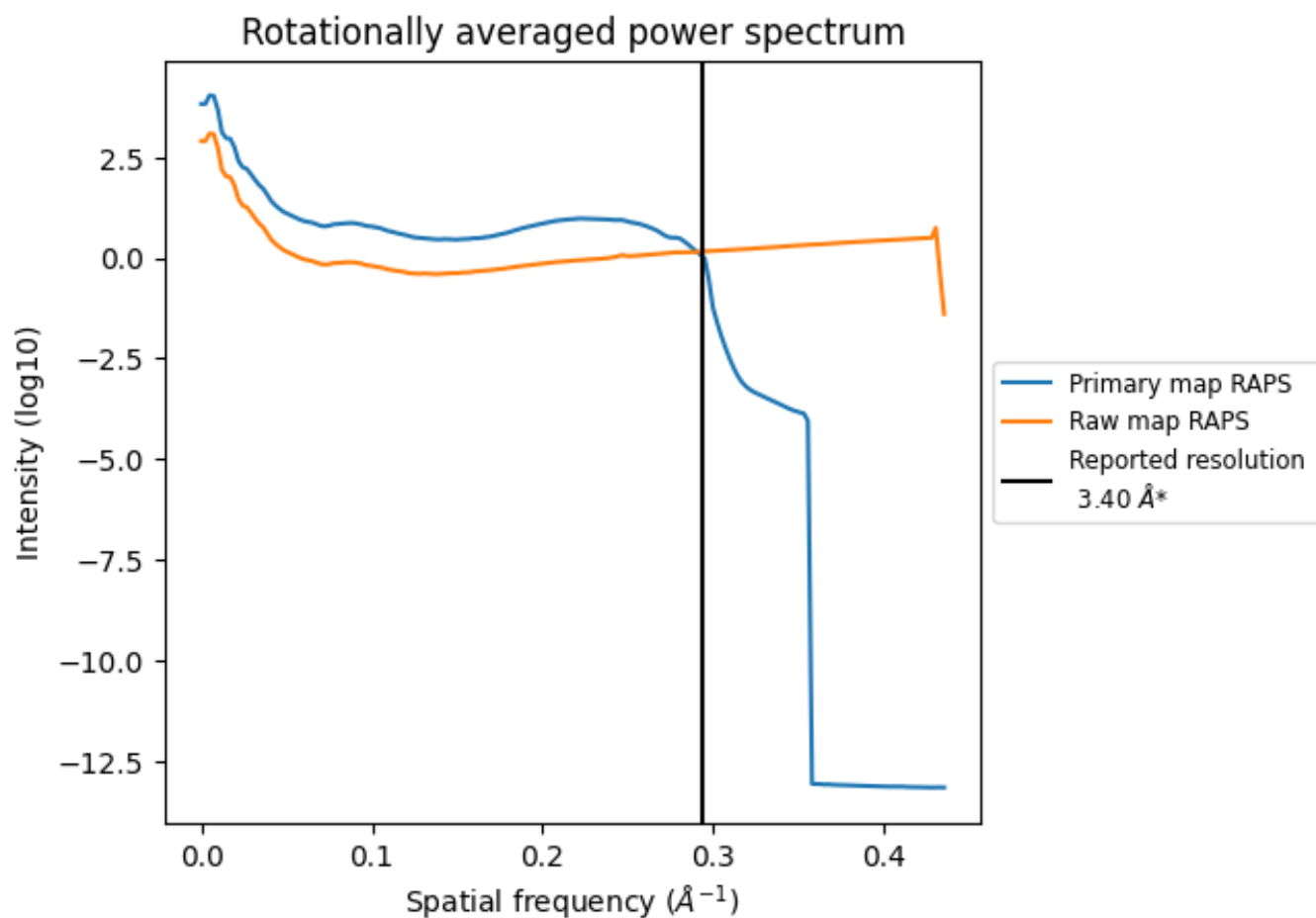
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 104 nm³; this corresponds to an approximate mass of 94 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](#)

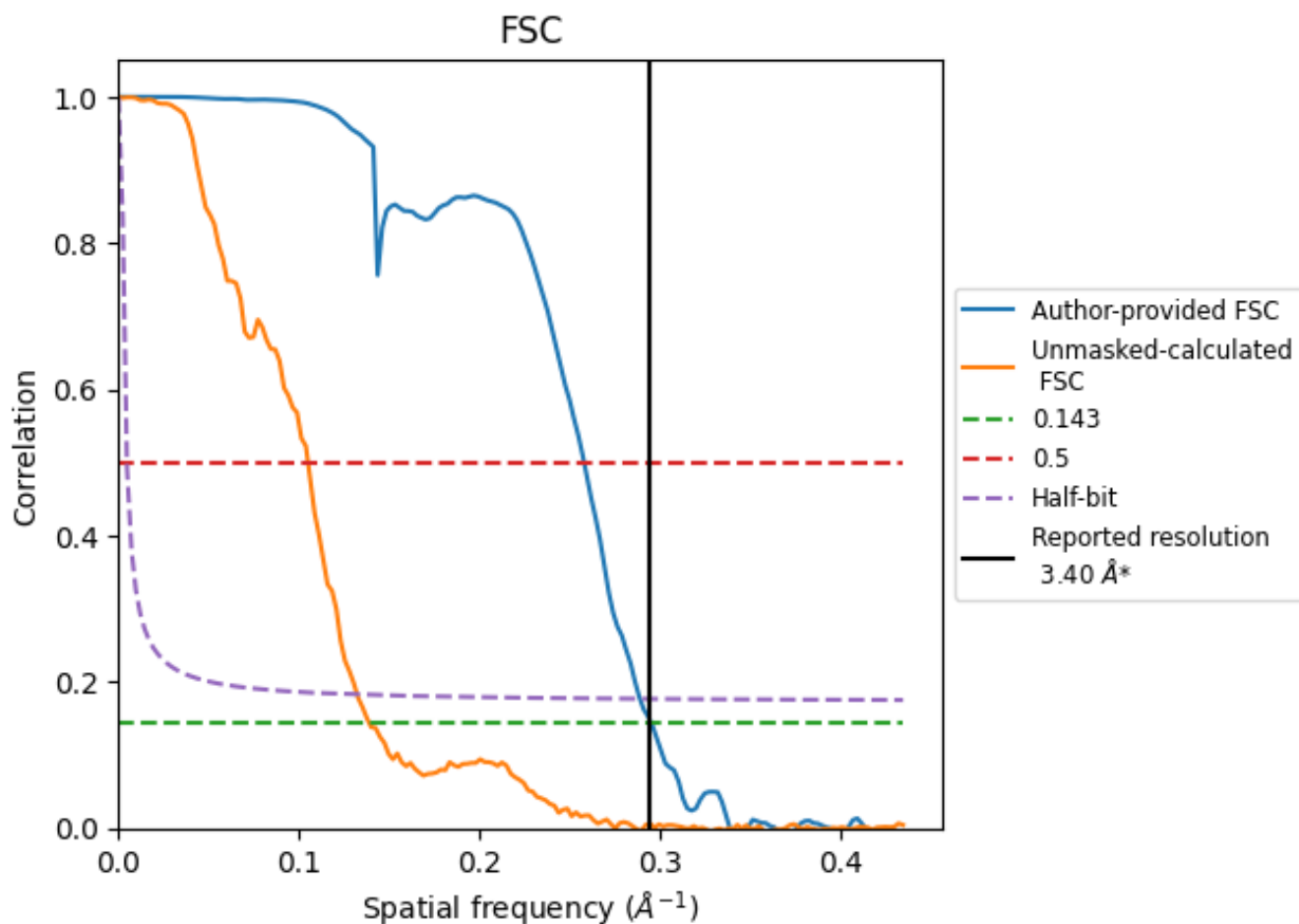


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

8.2 Resolution estimates [i](#)

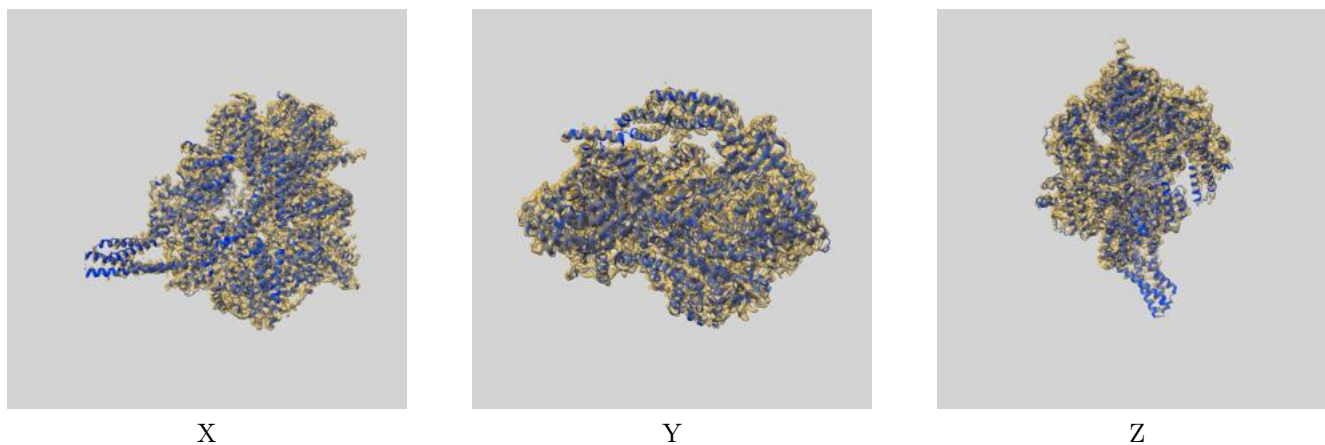
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.38	3.87	3.46
Unmasked-calculated*	7.18	9.51	7.55

*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 7.18 differs from the reported value 3.4 by more than 10 %

9 Map-model fit [i](#)

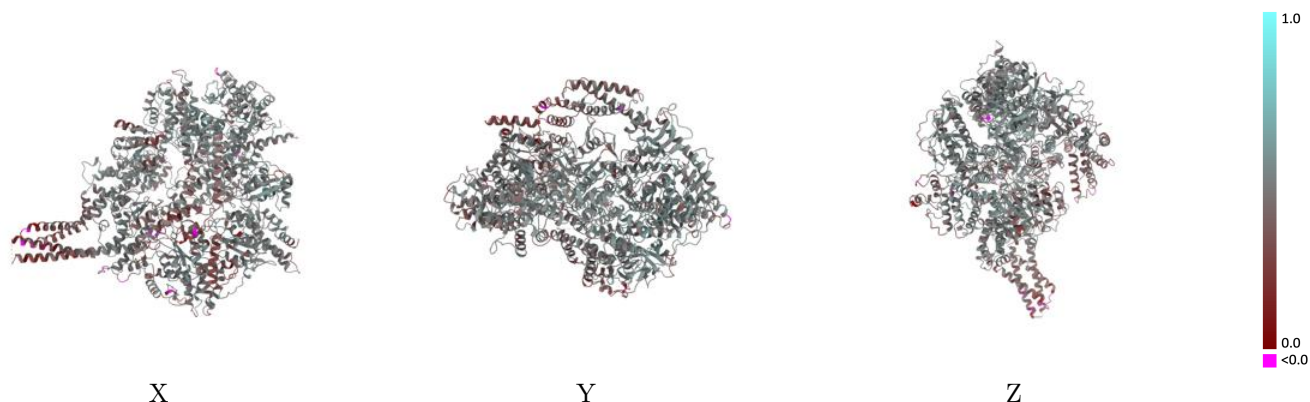
This section contains information regarding the fit between EMDB map EMD-28999 and PDB model 8FCY. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay [i](#)



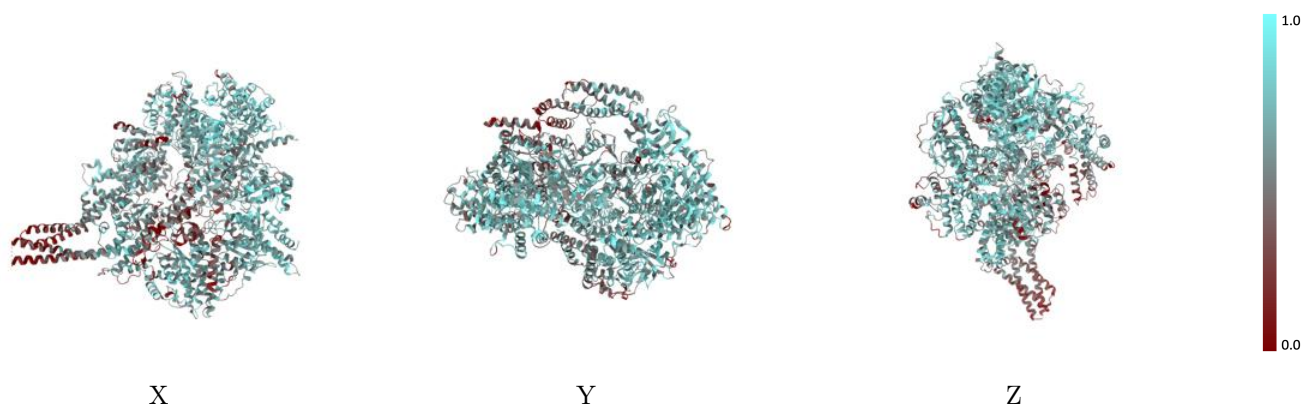
The images above show the 3D surface view of the map at the recommended contour level 0.35 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



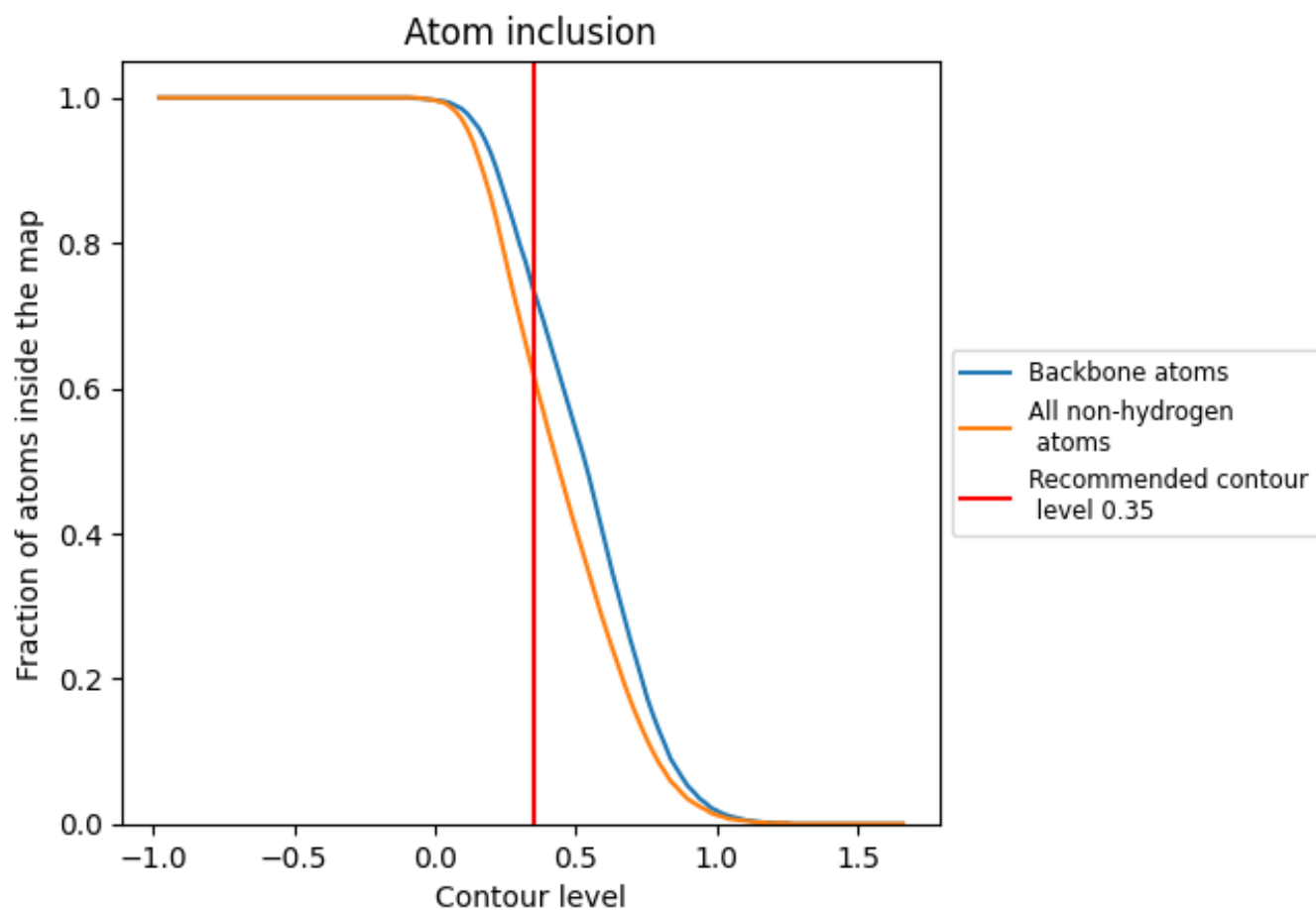
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.35).





9.4 Atom inclusion [i](#)



At the recommended contour level, 74% of all backbone atoms, 62% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.35) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6190	 0.4610
A	 0.6190	 0.4610

