



wwPDB EM Validation Summary Report ⓘ

Mar 12, 2026 – 06:17 PM UTC

PDB ID : 8VM0 / pdb_00008vm0
EMDB ID : EMD-43350
Title : Composite structure of human FASN with NADPH in State 4
Authors : Schultz, K.; Marmorstein, R.
Deposited on : 2024-01-12
Resolution : 3.30 Å (reported)
Based on initial model : 3HHD

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.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
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) : 2.49

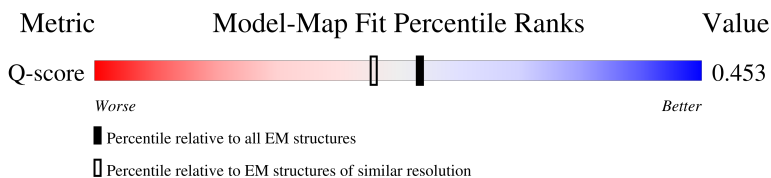
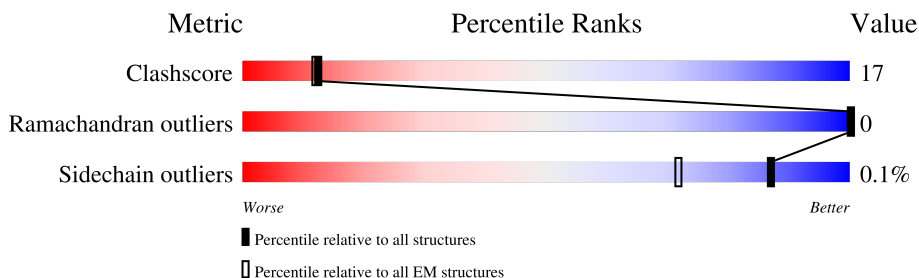
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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	15087 (2.80 - 3.80)

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	2553	 59% 22% 19%
1	B	2553	 58% 23% 19%

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 50709 atoms, of which 18827 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 Fatty acid synthase.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	2068	Total	C	H	N	O	S	0	0
			25176	10041	9343	2785	2934	73		
1	B	2071	Total	C	H	N	O	S	0	0
			25237	10054	9380	2789	2941	73		

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-31	MET	-	expression tag	UNP P49327
A	-30	SER	-	expression tag	UNP P49327
A	-29	TYR	-	expression tag	UNP P49327
A	-28	TYR	-	expression tag	UNP P49327
A	-27	ASP	-	expression tag	UNP P49327
A	-26	TYR	-	expression tag	UNP P49327
A	-25	LYS	-	expression tag	UNP P49327
A	-24	ASP	-	expression tag	UNP P49327
A	-23	ASP	-	expression tag	UNP P49327
A	-22	ASP	-	expression tag	UNP P49327
A	-21	ASP	-	expression tag	UNP P49327
A	-20	LYS	-	expression tag	UNP P49327
A	-19	ASP	-	expression tag	UNP P49327
A	-18	TYR	-	expression tag	UNP P49327
A	-17	ASP	-	expression tag	UNP P49327
A	-16	ILE	-	expression tag	UNP P49327
A	-15	PRO	-	expression tag	UNP P49327
A	-14	THR	-	expression tag	UNP P49327
A	-13	THR	-	expression tag	UNP P49327
A	-12	GLU	-	expression tag	UNP P49327
A	-11	ASN	-	expression tag	UNP P49327
A	-10	LEU	-	expression tag	UNP P49327
A	-9	TYR	-	expression tag	UNP P49327
A	-8	PHE	-	expression tag	UNP P49327
A	-7	GLN	-	expression tag	UNP P49327
A	-6	GLY	-	expression tag	UNP P49327

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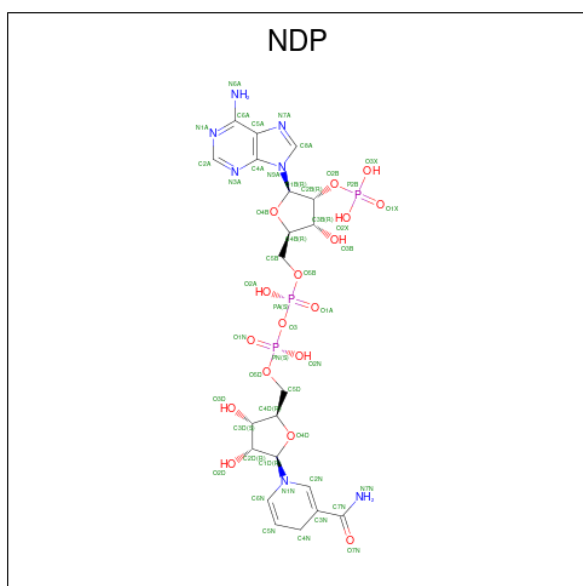
Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	ALA	-	expression tag	UNP P49327
A	-4	MET	-	expression tag	UNP P49327
A	-3	GLY	-	expression tag	UNP P49327
A	-2	SER	-	expression tag	UNP P49327
A	-1	GLY	-	expression tag	UNP P49327
A	0	ILE	-	expression tag	UNP P49327
A	1	PRO	-	expression tag	UNP P49327
A	1151	THR	LYS	conflict	UNP P49327
A	2512	LEU	-	expression tag	UNP P49327
A	2513	GLU	-	expression tag	UNP P49327
A	2514	HIS	-	expression tag	UNP P49327
A	2515	HIS	-	expression tag	UNP P49327
A	2516	HIS	-	expression tag	UNP P49327
A	2517	HIS	-	expression tag	UNP P49327
A	2518	HIS	-	expression tag	UNP P49327
A	2519	HIS	-	expression tag	UNP P49327
A	2520	HIS	-	expression tag	UNP P49327
A	2521	HIS	-	expression tag	UNP P49327
B	-31	MET	-	expression tag	UNP P49327
B	-30	SER	-	expression tag	UNP P49327
B	-29	TYR	-	expression tag	UNP P49327
B	-28	TYR	-	expression tag	UNP P49327
B	-27	ASP	-	expression tag	UNP P49327
B	-26	TYR	-	expression tag	UNP P49327
B	-25	LYS	-	expression tag	UNP P49327
B	-24	ASP	-	expression tag	UNP P49327
B	-23	ASP	-	expression tag	UNP P49327
B	-22	ASP	-	expression tag	UNP P49327
B	-21	ASP	-	expression tag	UNP P49327
B	-20	LYS	-	expression tag	UNP P49327
B	-19	ASP	-	expression tag	UNP P49327
B	-18	TYR	-	expression tag	UNP P49327
B	-17	ASP	-	expression tag	UNP P49327
B	-16	ILE	-	expression tag	UNP P49327
B	-15	PRO	-	expression tag	UNP P49327
B	-14	THR	-	expression tag	UNP P49327
B	-13	THR	-	expression tag	UNP P49327
B	-12	GLU	-	expression tag	UNP P49327
B	-11	ASN	-	expression tag	UNP P49327
B	-10	LEU	-	expression tag	UNP P49327
B	-9	TYR	-	expression tag	UNP P49327
B	-8	PHE	-	expression tag	UNP P49327

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-7	GLN	-	expression tag	UNP P49327
B	-6	GLY	-	expression tag	UNP P49327
B	-5	ALA	-	expression tag	UNP P49327
B	-4	MET	-	expression tag	UNP P49327
B	-3	GLY	-	expression tag	UNP P49327
B	-2	SER	-	expression tag	UNP P49327
B	-1	GLY	-	expression tag	UNP P49327
B	0	ILE	-	expression tag	UNP P49327
B	1	PRO	-	expression tag	UNP P49327
B	1151	THR	LYS	conflict	UNP P49327
B	2512	LEU	-	expression tag	UNP P49327
B	2513	GLU	-	expression tag	UNP P49327
B	2514	HIS	-	expression tag	UNP P49327
B	2515	HIS	-	expression tag	UNP P49327
B	2516	HIS	-	expression tag	UNP P49327
B	2517	HIS	-	expression tag	UNP P49327
B	2518	HIS	-	expression tag	UNP P49327
B	2519	HIS	-	expression tag	UNP P49327
B	2520	HIS	-	expression tag	UNP P49327
B	2521	HIS	-	expression tag	UNP P49327

- Molecule 2 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: $\text{C}_{21}\text{H}_{30}\text{N}_7\text{O}_{17}\text{P}_3$) (labeled as "Ligand of Interest" by depositor).

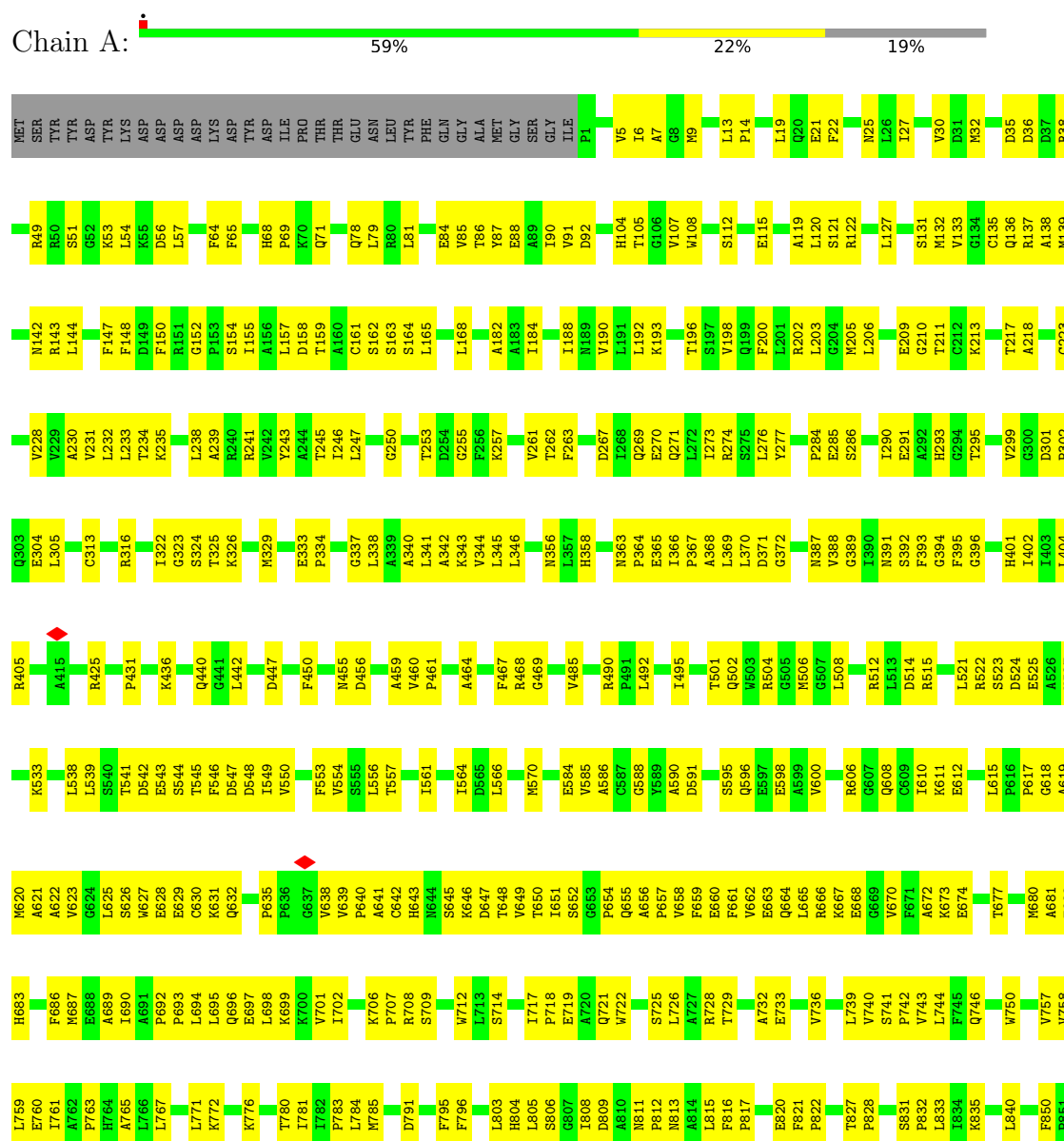


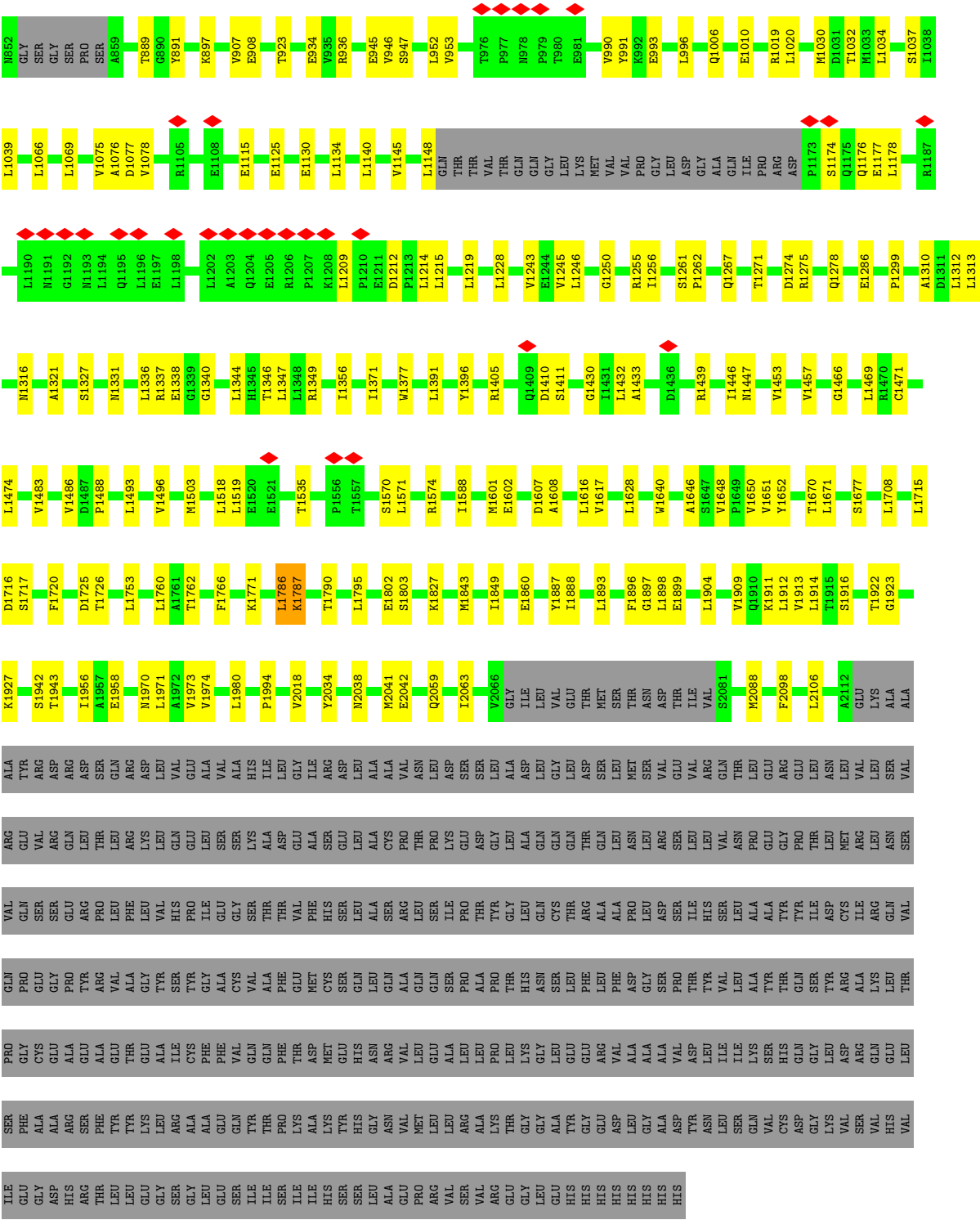
Mol	Chain	Residues	Atoms						AltConf
2	A	1	Total	C	H	N	O	P	0
			74	21	26	7	17	3	
2	A	1	Total	C	H	N	O	P	0
			74	21	26	7	17	3	
2	B	1	Total	C	H	N	O	P	0
			74	21	26	7	17	3	
2	B	1	Total	C	H	N	O	P	0
			74	21	26	7	17	3	

3 Residue-property plots

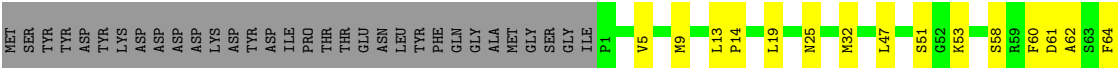
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Fatty acid synthase





● Molecule 1: Fatty acid synthase



L1400	R1404	I1413	V1417	K1429	G1430	I1431	S1437	S1438	R1439	A1445	I1446	S1451	G1452	V1453	V1457	G1466	M1467	R1468	L1469	R1470	C1471	L1474	E1485	V1486	D1487	S1490	D1500	L1501	N1504	E1521	R1552	Q1555	C1558	Q1562	V1566									
PR0	ARG	P1173	E1177	C1186	R1187	L1188	Q1189	L1190	N1191	G1192	N1193	L1194	Q1195	L1196	E1197	L1198	A1199	Q1200	V1201	L1202	A1203	E1205	P1207	K1208	L1209	P1210	L1214	L1215	L1218	L1228	V1242	V1245	L1246	H1249	G1250	H1251	L1252	I1256	L1265	Y1270	D1274	R1275		
Q1278	A1279	L1280	V1292	A1293	Q1294	W1297	D1298	P1299	A1300	D1301	S1305	A1306	L1312	L1313	V1314	C1315	N1316	C1317	S1327	N1331	M1332	V1333	G1339	H1345	L1348	R1349	G1354	D1355	I1356	Q1366	Y1367	G1368	Q1369	G1370	I1371	L1372	S1373	A1376	L1386	V1389	G1390	L1391	K1392	K1393
H804	L805	S806	N813	A814	P822	A823	P824	S831	P832	L833	A841	W842	W852	GLY	SER	GLY	SER	PRO	SER	A859	T879	L880	T898	L899	V912	V913	I924	L933	E934	V935	E939	E948	N949	V958	P972	T976	P977	N978	P979	T980	E981	P982	Y991	
Q1006	E1014	L1021	F1029	T1032	V1052	I1055	T1068	L1069	Q1070	D1071	K1072	A1073	Q1074	V1079	Q1109	Q1110	V1111	E1125	G1126	C1127	L1128	L1134	C1141	V1145	T1150	THR	VAL	THR	GLN	GLN	GLY	LEU	LYS	MET	VAL	VAL	PRO	GLY	LEU	ASP	GLY	ALA	GLN	ILE
PR0	ARG	P1173	E1177	C1186	R1187	L1188	Q1189	L1190	N1191	G1192	N1193	L1194	Q1195	L1196	E1197	L1198	A1199	Q1200	V1201	L1202	A1203	E1205	P1207	K1208	L1209	P1210	L1214	L1215	L1218	L1228	V1242	V1245	L1246	H1249	G1250	H1251	L1252	I1256	L1265	Y1270	D1274	R1275		
Q1278	A1279	L1280	V1292	A1293	Q1294	W1297	D1298	P1299	A1300	D1301	S1305	A1306	L1312	L1313	V1314	C1315	N1316	C1317	S1327	N1331	M1332	V1333	G1339	H1345	L1348	R1349	G1354	D1355	I1356	Q1366	Y1367	G1368	Q1369	G1370	I1371	L1372	S1373	A1376	L1386	V1389	G1390	L1391	K1392	K1393

VAL	THR	VAL	SER	VAL	SER	VAL	GLN	ALA	VAL	ALA	D2003	Q1595
ILE	GLY	PRO	SER	GLN	VAL	GLN	PRO	ARG	GLY	ALA	T2006	D1596
GLY	ALA	CYS	GLY	GLY	SER	SER	GLY	VAL	ARG	TYR	R2007	S1597
ASP	ALA	GLU	ARG	PRO	GLU	GLY	PRO	GLN	ASP	ARG	L2013	E1502
HIS	ALA	ALA	SER	TYR	ARG	GLY	TYR	LEU	ASP	ARG	V2018	F1603
THR	ALA	ALA	PHE	ARG	PRO	VAL	ARG	THR	SER	GLN	V2022	D1607
LEU	THR	THR	ALA	ALA	PHE	GLY	LEU	ARG	ARG	LYS	R1612	R1612
GLY	LYS	GLY	GLY	VAL	LEU	VAL	LEU	LEU	ASP	LEU	N2033	W1640
GLY	LEU	ILE	ARG	SER	HIS	SER	GLN	VAL	VAL	VAL	Y2034	W1640
GLY	ALA	CYS	TYR	TYR	PRO	GLY	GLY	GLY	GLY	GLY	M2041	V1650
GLY	ALA	PHE	ALA	GLY	ILE	LEU	LEU	VAL	VAL	VAL	E2042	S1677
SER	GLN	VAL	CYS	VAL	GLY	SER	CYS	SER	ALA	ALA	R2043	V1680
ILE	THR	GLN	VAL	VAL	SER	SER	LYS	HIS	HIS	HIS	R2048	G1681
ILE	THR	GLN	ALA	PHE	THR	THR	ALA	ILE	ILE	ILE	E2051	Q1682
ILE	LYS	THR	ALA	MET	PHE	VAL	GLY	GLY	GLY	ILE	Q2059	Q1714
HIS	LYS	MET	CYS	GLY	HIS	SER	SER	GLY	ARG	ASP	W2060	L1743
SER	THR	GLY	HIS	GLN	SER	LEU	LEU	LEU	LEU	LEU	G2061	R1765
LEU	GLY	ASN	GLY	GLN	ALA	ALA	CYS	CYS	ALA	ALA	I2063	I1769
ALA	ASN	ARG	GLN	GLN	ARG	PRO	VAL	VAL	VAL	VAL	V2066	S1775
ALA	VAL	VAL	ALA	GLN	LEU	THR	THR	ASN	ASN	LEU	GLY	H1792
PRO	MET	LEU	LEU	GLN	SER	PRO	ILE	LYS	ASP	ILE	THR	C1828
GLU	LEU	ALA	ARG	PRO	ILE	PRO	PRO	GLY	SER	LEU	THR	E1837
GLY	LYS	THR	LYS	THR	GLY	THR	THR	GLY	LEU	ALA	THR	E1862
LEU	GLY	GLY	ASN	ASN	LEU	GLN	GLN	GLY	LEU	LEU	ASP	G1867
GLU	ALA	LEU	SER	SER	CYS	GLN	GLN	GLY	GLY	THR	THR	A1868
HIS	THR	GLY	PHE	ARG	THR	ARG	ALA	GLN	SER	ASP	ASP	K1869
HIS	ARG	VAL	LEU	ALA	ALA	ALA	LEU	LEU	THR	ILE	THR	I1889
HIS	VAL	VAL	ASP	ASP	PRO	ILE	LEU	VAL	VAL	VAL	P2085	F1896
HIS	ASP	VAL	LEU	GLY	ASP	SER	VAL	ARG	ARG	GLN	M2088	L1912
HIS	GLY	ALA	ALA	GLY	LEU	LEU	ASN	THR	THR	THR	C2091	V1968
HIS	ALA	ALA	THR	THR	ALA	GLY	PRO	GLY	GLY	GLY	L2097	N1970
HIS	ASP	THR	THR	GLN	TYR	GLY	GLY	ARG	ARG	ARG	F2098	L1971
HIS	GLY	GLN	ASP	GLN	TYR	ILE	PRO	THR	LEU	LEU	L2106	E1981
LYS	LYS	TYR	ARG	TYR	ASP	ASP	THR	MET	VAL	LEU	E2113	S1997
VAL	VAL	ASP	ALA	ARG	ILE	ILE	ARG	VAL	VAL	LEU	LYS	N2001
VAL	GLN	GLY	LYS	ARG	GLN	GLY	LEU	ASN	SER	SER	ALA	L2002

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	114182	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	52.4	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.728	Depositor
Minimum map value	-0.169	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.027	Depositor
Recommended contour level	0.182	Depositor
Map size (Å)	384.84, 384.84, 384.84	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.069, 1.069, 1.069	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: NDP

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	0.17	0/16198	0.30	2/22023 (0.0%)
1	B	0.19	0/16222	0.33	0/22055
All	All	0.18	0/32420	0.31	2/44078 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1786	LEU	N-CA-C	-6.68	104.00	111.28
1	A	1787	LYS	N-CA-C	-5.11	102.72	110.28

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	15833	9343	15809	537	0
1	B	15857	9380	15826	556	0
2	A	96	52	52	1	0
2	B	96	52	52	3	0
All	All	31882	18827	31739	1077	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 17.

The worst 5 of 1077 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:165:LEU:HD12	1:A:392:SER:CB	1.74	1.17
1:A:165:LEU:HD12	1:A:392:SER:OG	1.52	1.07
1:A:803:LEU:HD11	1:A:808:ILE:HD12	1.41	1.00
1:A:628:GLU:HA	1:A:631:LYS:HE2	1.40	0.98
1:A:165:LEU:HG	1:A:337:GLY:HA3	1.45	0.97

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	2060/2553 (81%)	2006 (97%)	54 (3%)	0	100	100
1	B	2063/2553 (81%)	2009 (97%)	54 (3%)	0	100	100
All	All	4123/5106 (81%)	4015 (97%)	108 (3%)	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	1705/2117 (80%)	1705 (100%)	0	100	100
1	B	1708/2117 (81%)	1706 (100%)	2 (0%)	88	90
All	All	3413/4234 (81%)	3411 (100%)	2 (0%)	87	90

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	580	HIS
1	B	1828	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 63 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1815	GLN
1	B	1278	GLN
1	B	199	GLN
1	B	1195	GLN
1	B	1845	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 oligosaccharides 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	NDP	A	2601	-	51,52,52	0.48	0	71,80,80	0.62	0
2	NDP	B	2602	-	51,52,52	0.49	0	71,80,80	0.72	1 (1%)
2	NDP	A	2602	-	51,52,52	0.50	0	71,80,80	0.64	1 (1%)
2	NDP	B	2601	-	51,52,52	0.51	0	71,80,80	0.68	1 (1%)

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	NDP	A	2601	-	-	12/34/77/77	0/5/5/5
2	NDP	B	2602	-	-	6/34/77/77	0/5/5/5
2	NDP	A	2602	-	-	11/34/77/77	0/5/5/5
2	NDP	B	2601	-	-	13/34/77/77	0/5/5/5

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2602	NDP	P2B-O2B-C2B	-3.77	113.37	123.43
2	B	2601	NDP	P2B-O2B-C2B	-3.74	113.44	123.43
2	A	2602	NDP	P2B-O2B-C2B	-3.23	114.81	123.43

There are no chirality outliers.

5 of 42 torsion outliers are listed below:

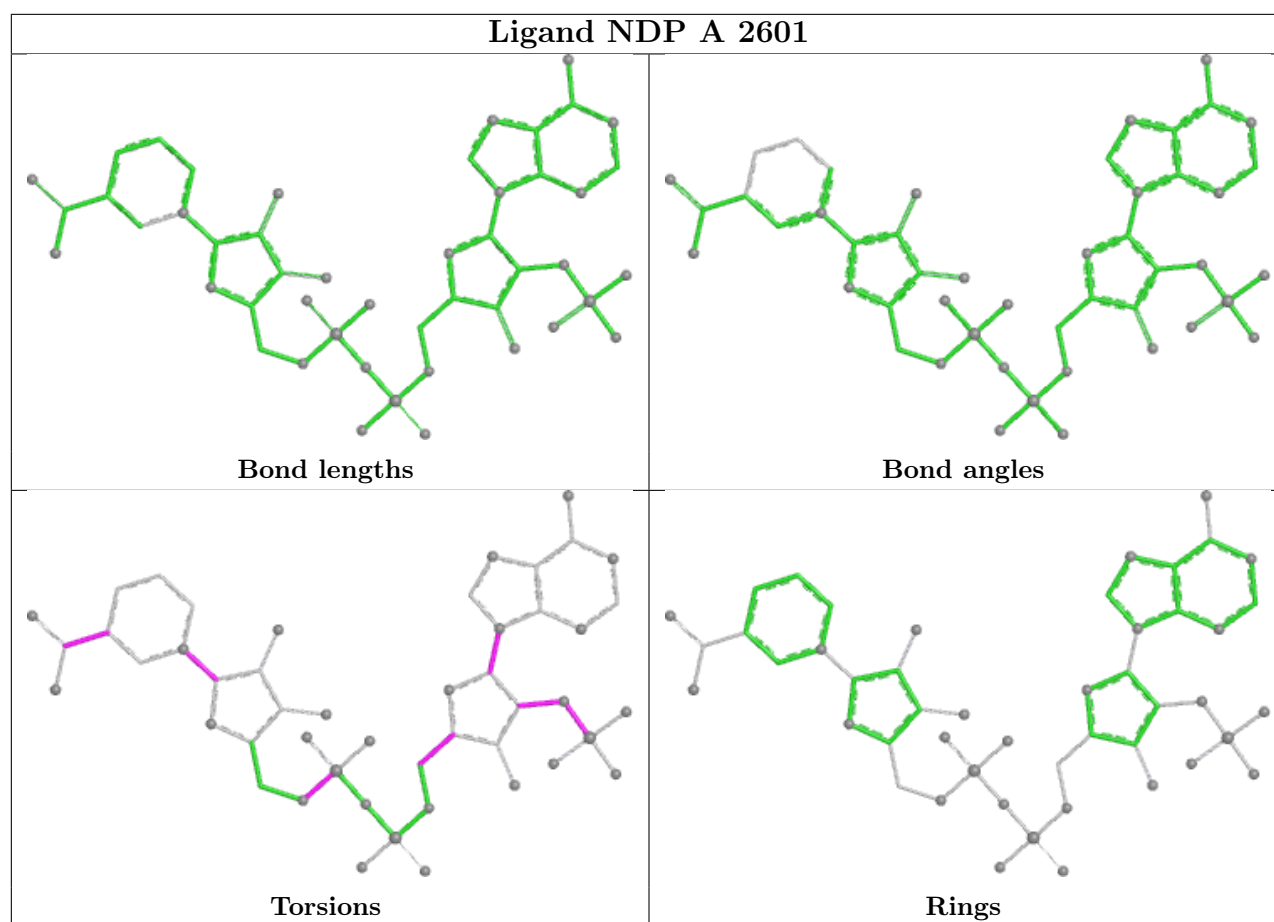
Mol	Chain	Res	Type	Atoms
2	A	2601	NDP	C5D-O5D-PN-O3
2	A	2601	NDP	C5D-O5D-PN-O1N
2	A	2601	NDP	C2N-C3N-C7N-O7N
2	A	2602	NDP	C5B-O5B-PA-O2A
2	A	2602	NDP	C5B-O5B-PA-O3

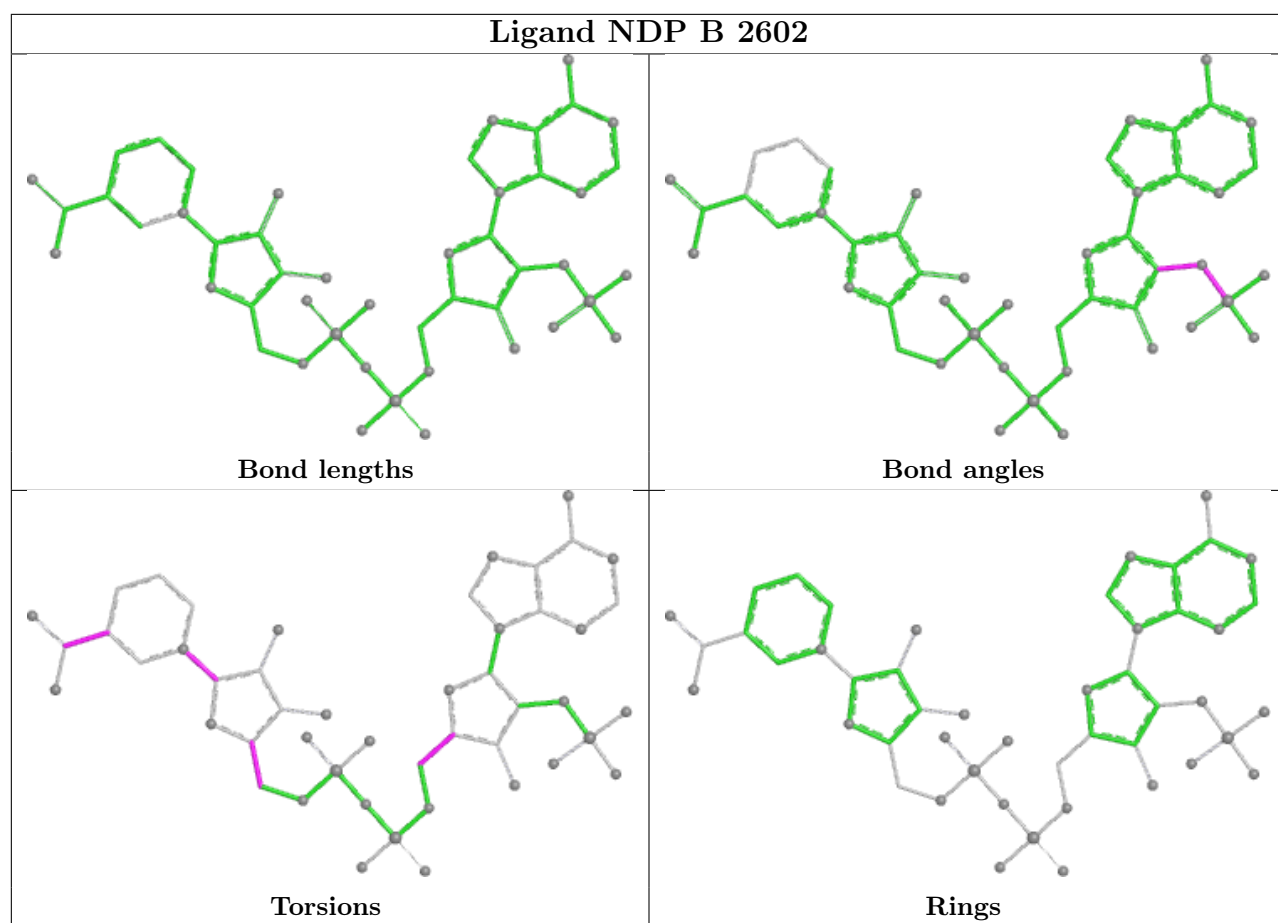
There are no ring outliers.

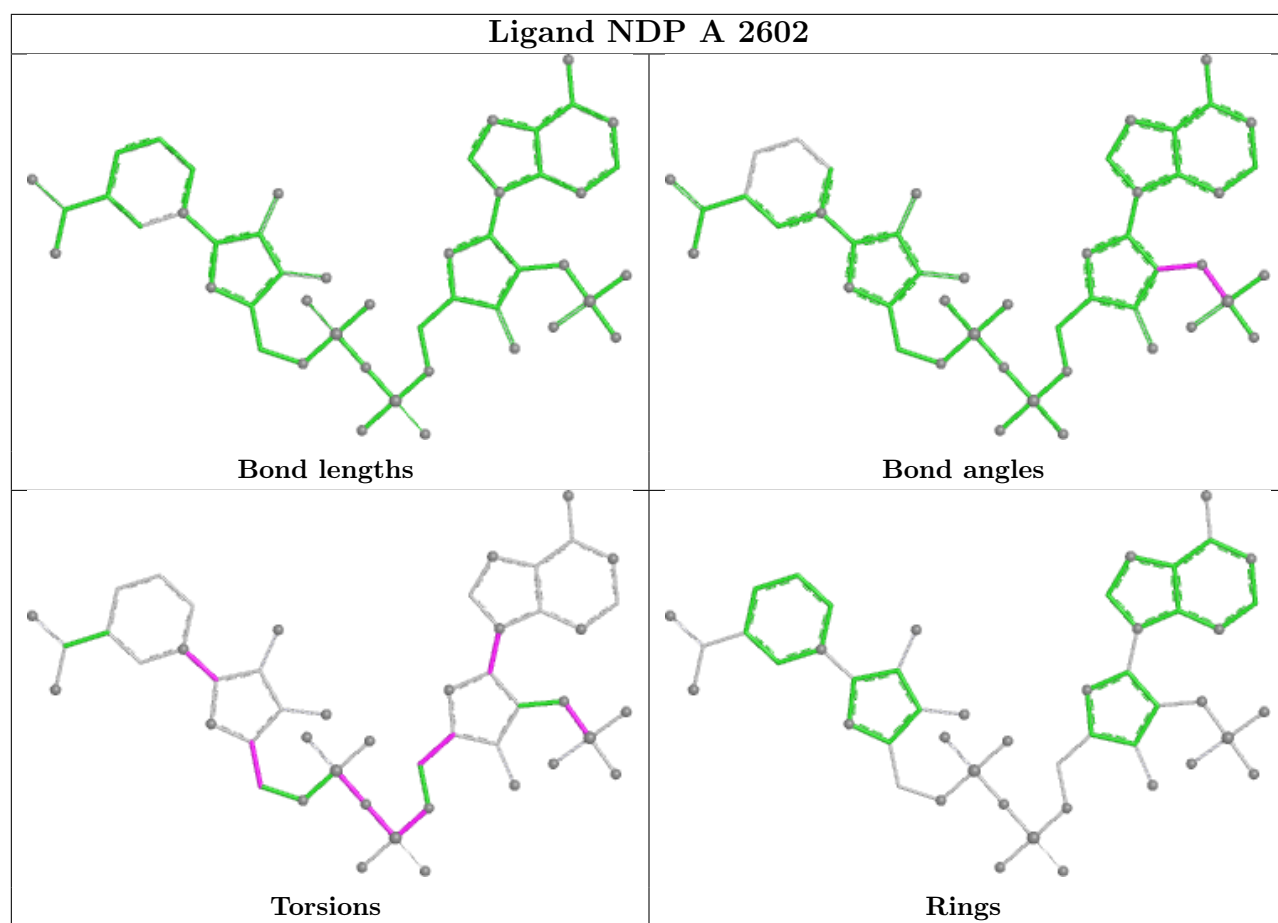
3 monomers are involved in 4 short contacts:

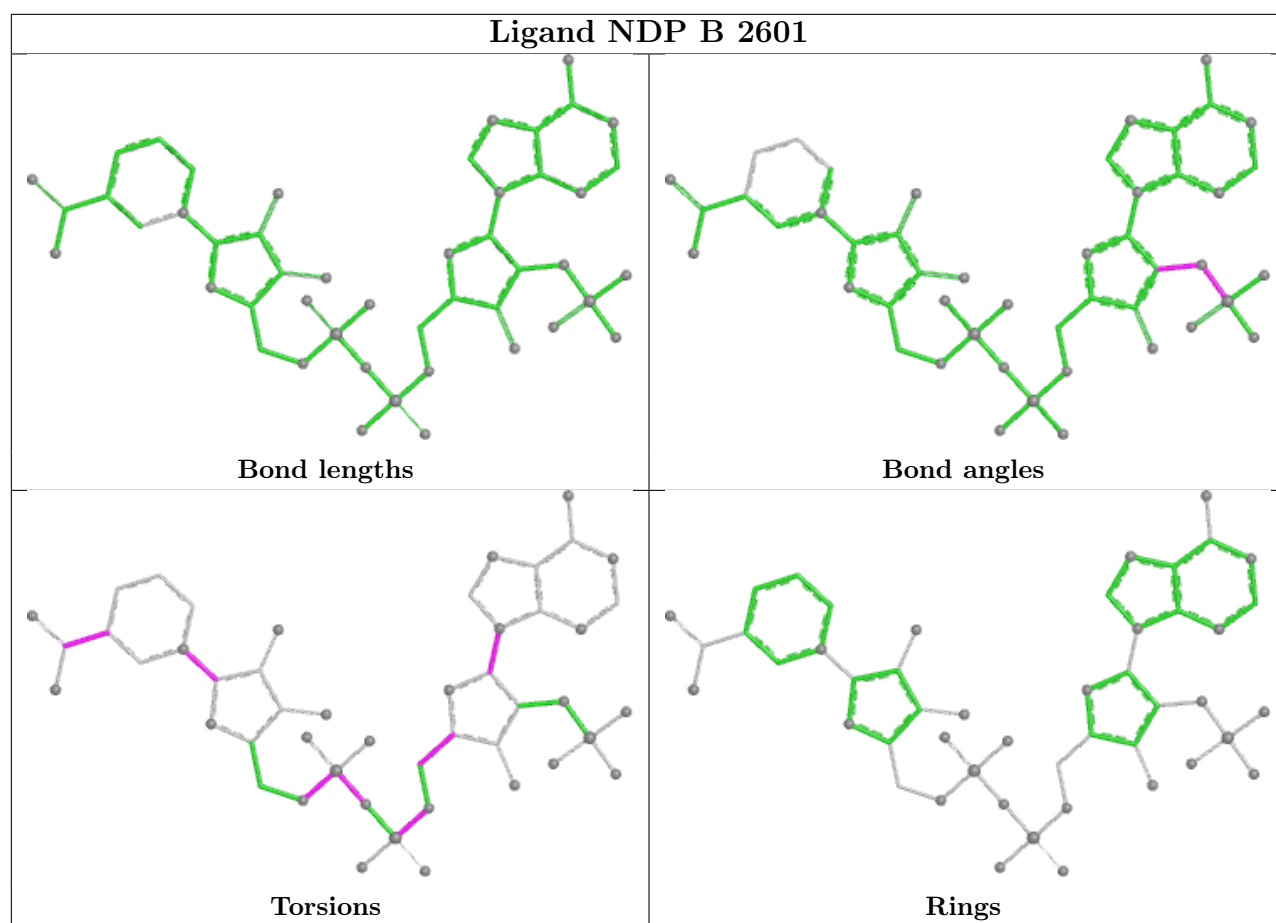
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2602	NDP	1	0
2	A	2602	NDP	1	0
2	B	2601	NDP	2	0

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-43350. These allow visual inspection of the internal detail of the map and identification of artifacts.

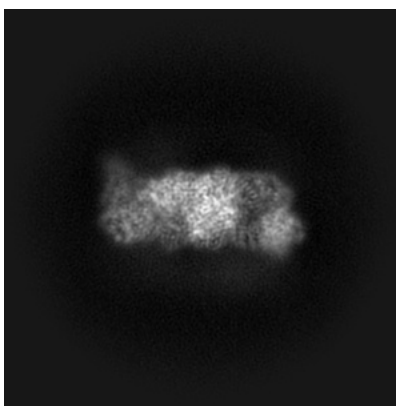
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

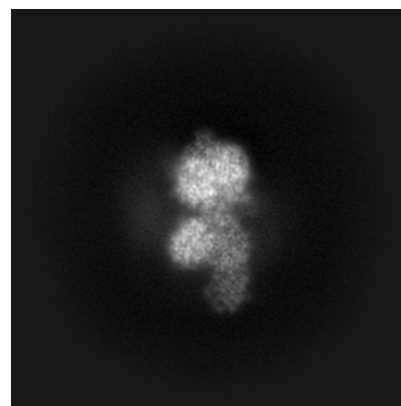
6.1.1 Primary map



X

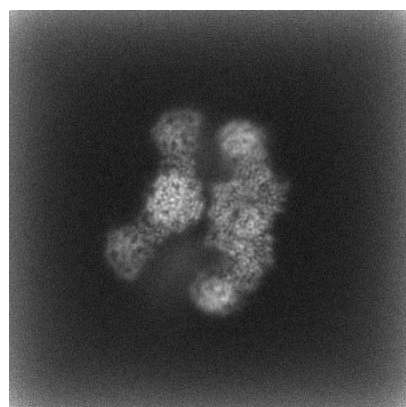


Y

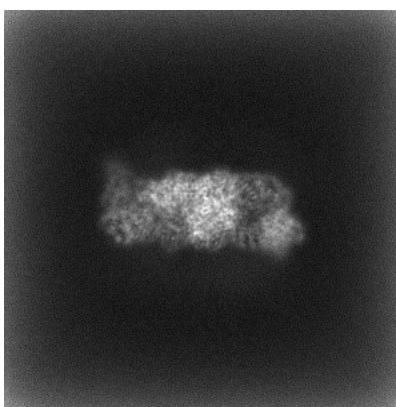


Z

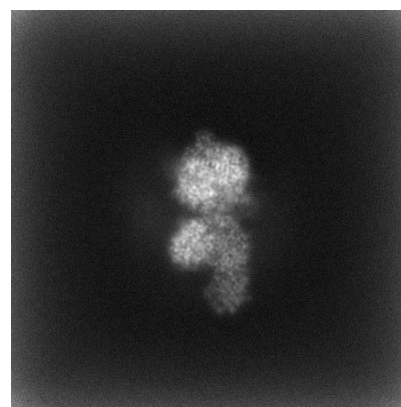
6.1.2 Raw map



X



Y

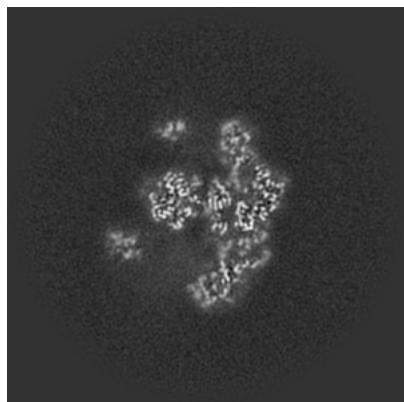


Z

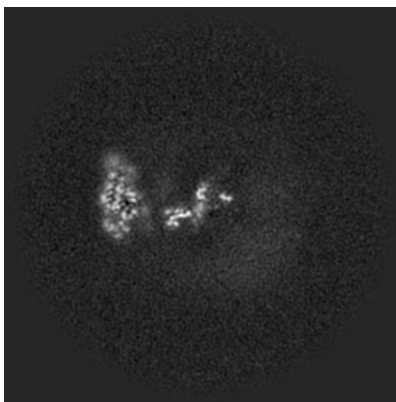
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

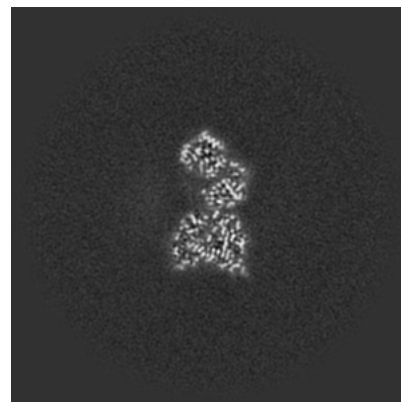
6.2.1 Primary map



X Index: 180

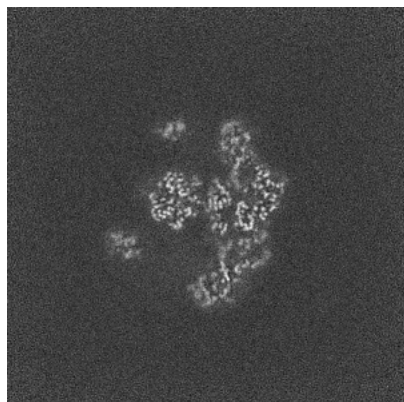


Y Index: 180



Z Index: 180

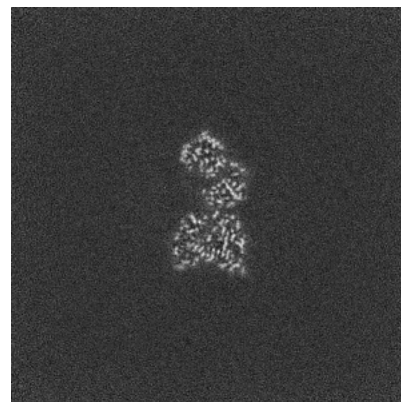
6.2.2 Raw map



X Index: 180



Y Index: 180

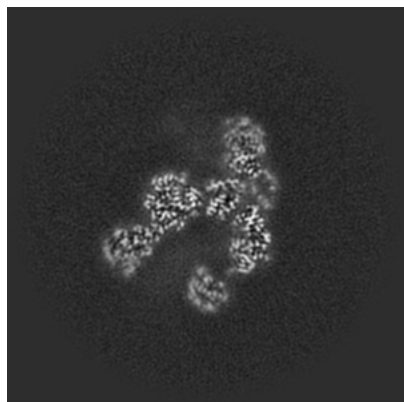


Z Index: 180

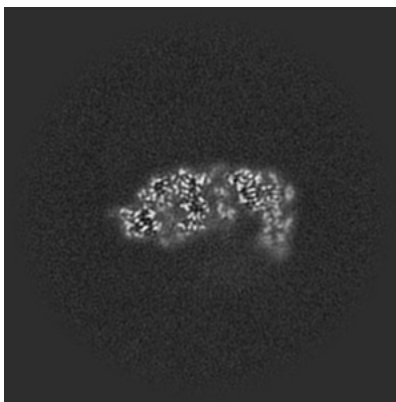
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

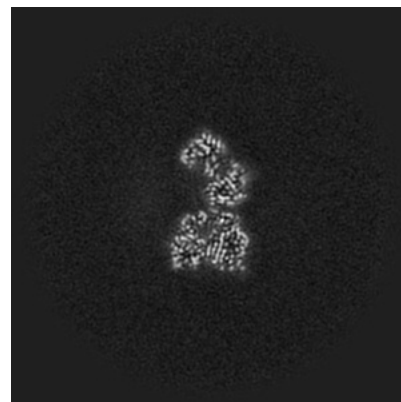
6.3.1 Primary map



X Index: 190

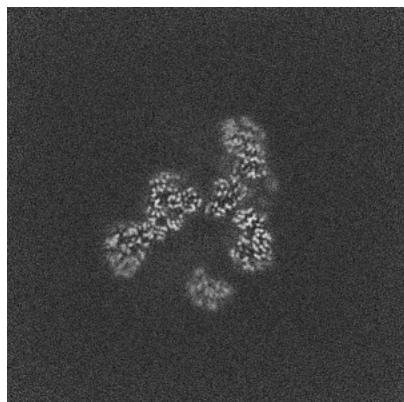


Y Index: 214

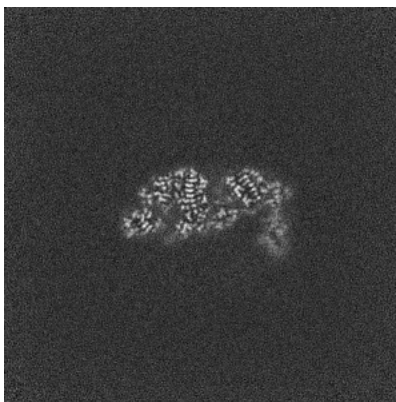


Z Index: 182

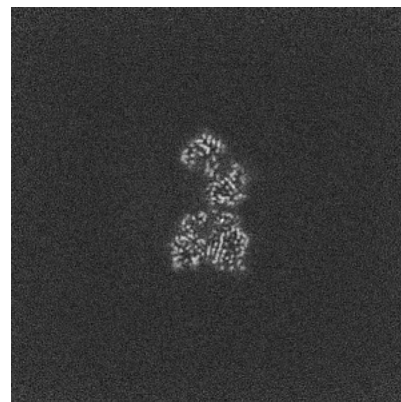
6.3.2 Raw map



X Index: 194



Y Index: 218

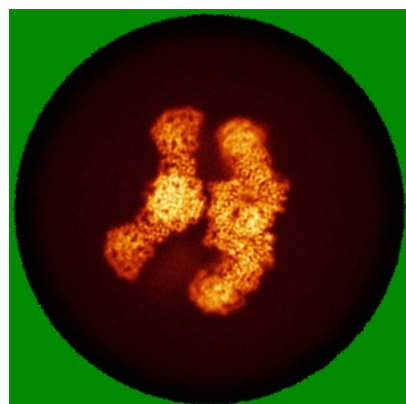


Z Index: 182

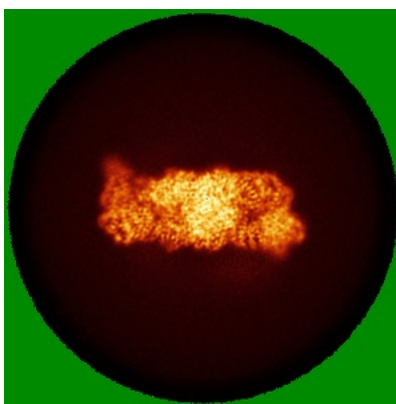
The images above show the largest variance slices of the map in three orthogonal directions.

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

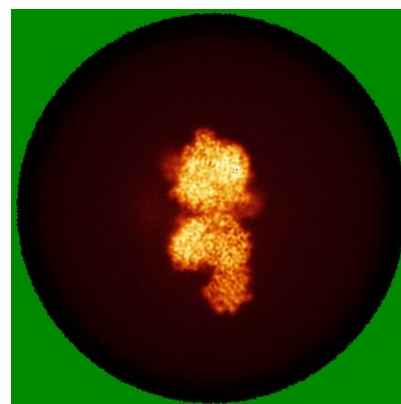
6.4.1 Primary map



X

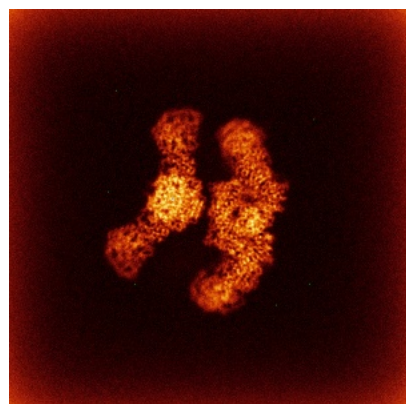


Y

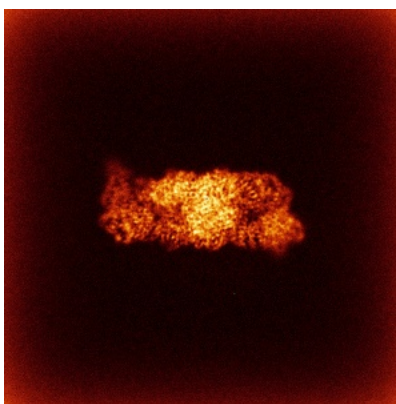


Z

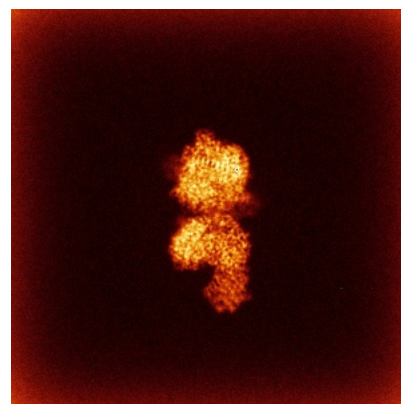
6.4.2 Raw map



X



Y

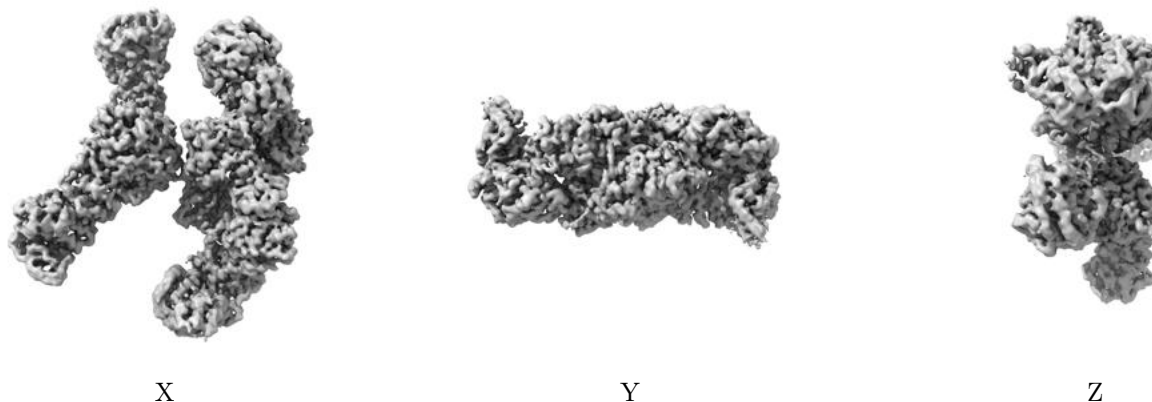


Z

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

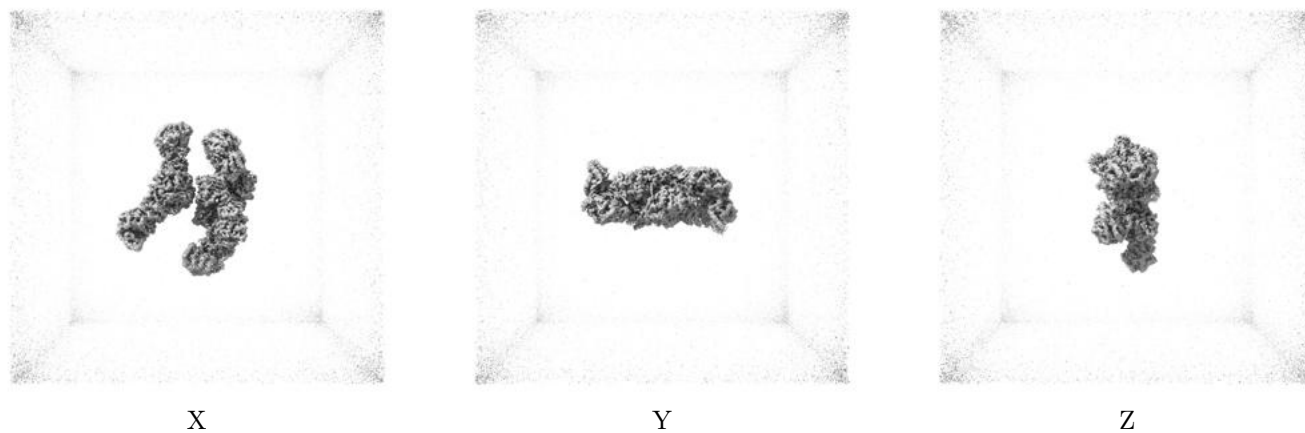
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.182. 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.

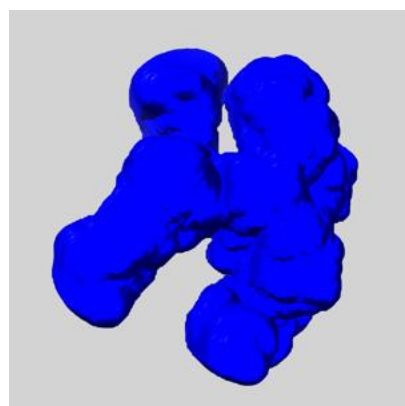
6.6 Mask visualisation [i](#)

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

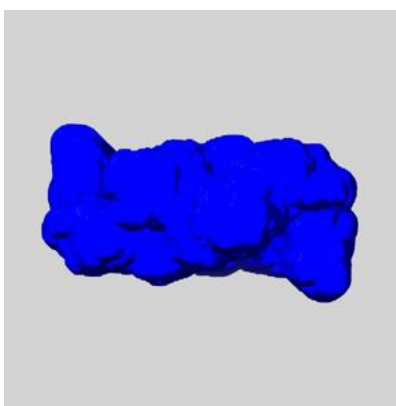
A mask typically either:

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

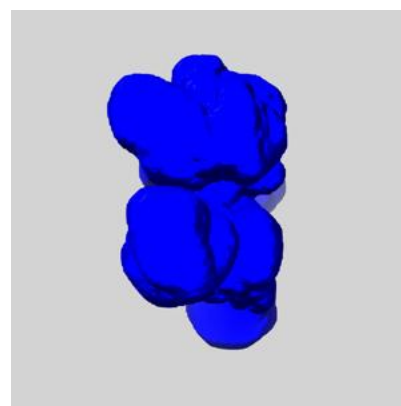
6.6.1 emd_43350_msk_1.map [i](#)



X



Y

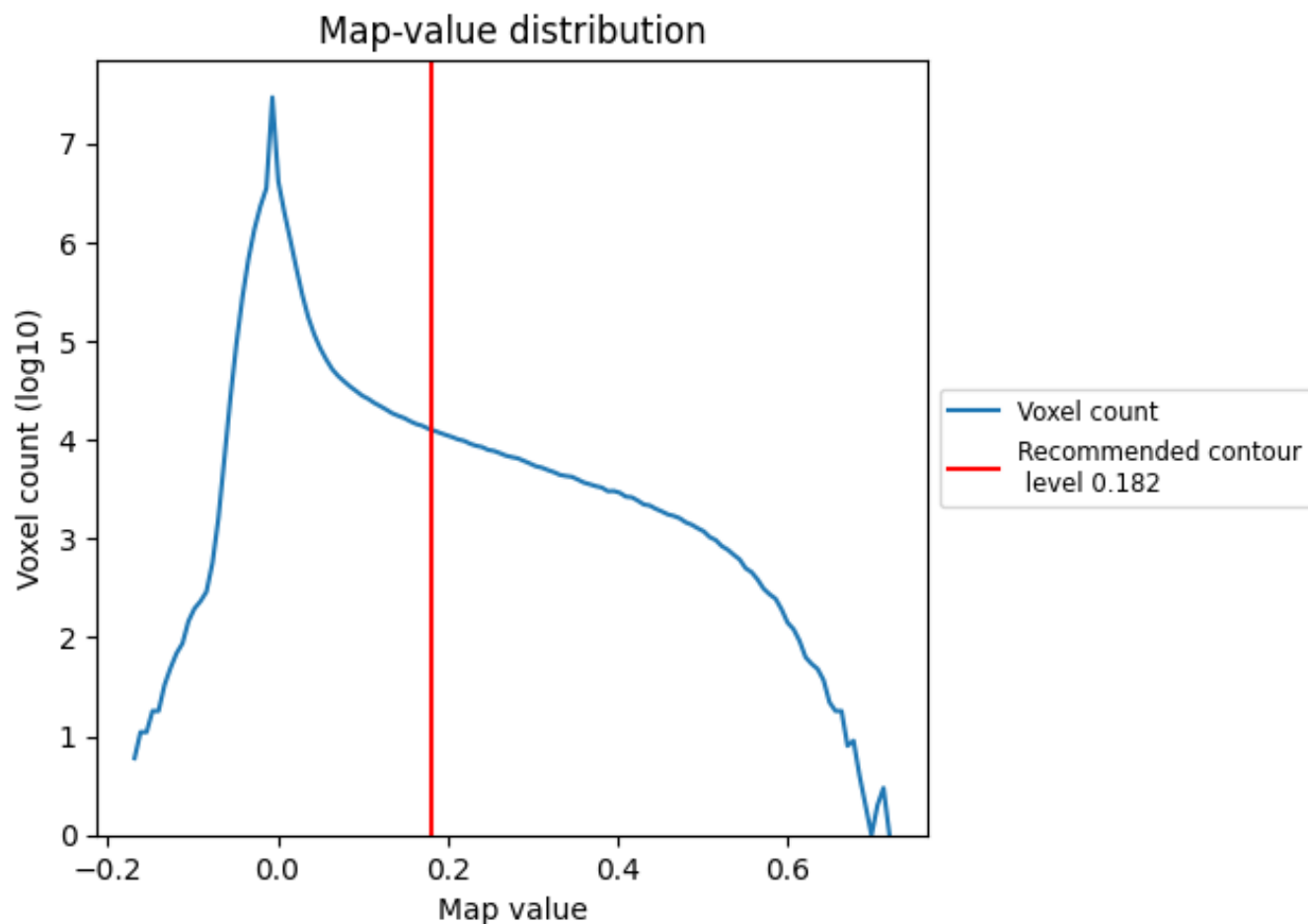


Z

7 Map analysis [i](#)

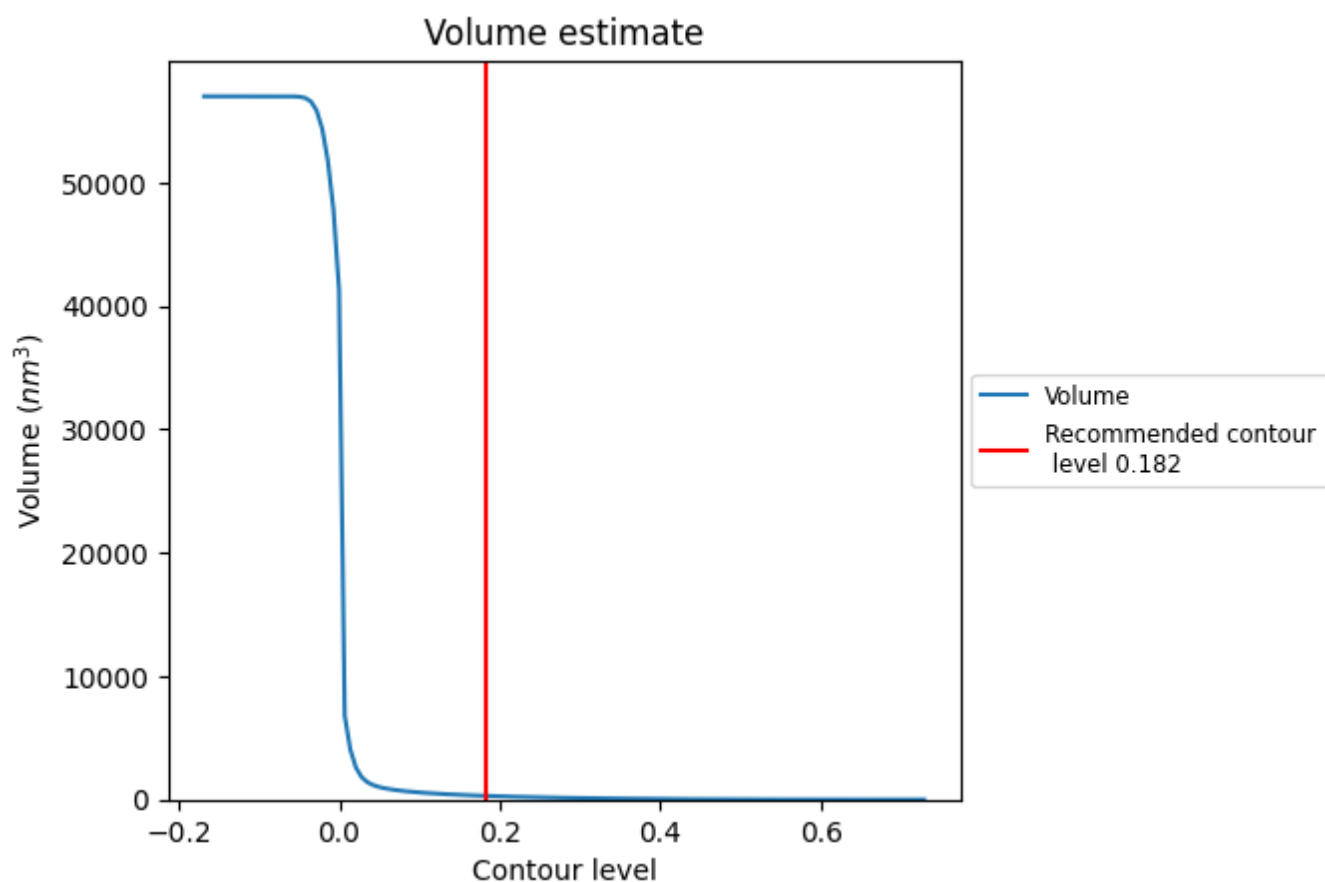
This section contains the results of statistical analysis of the map.

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.

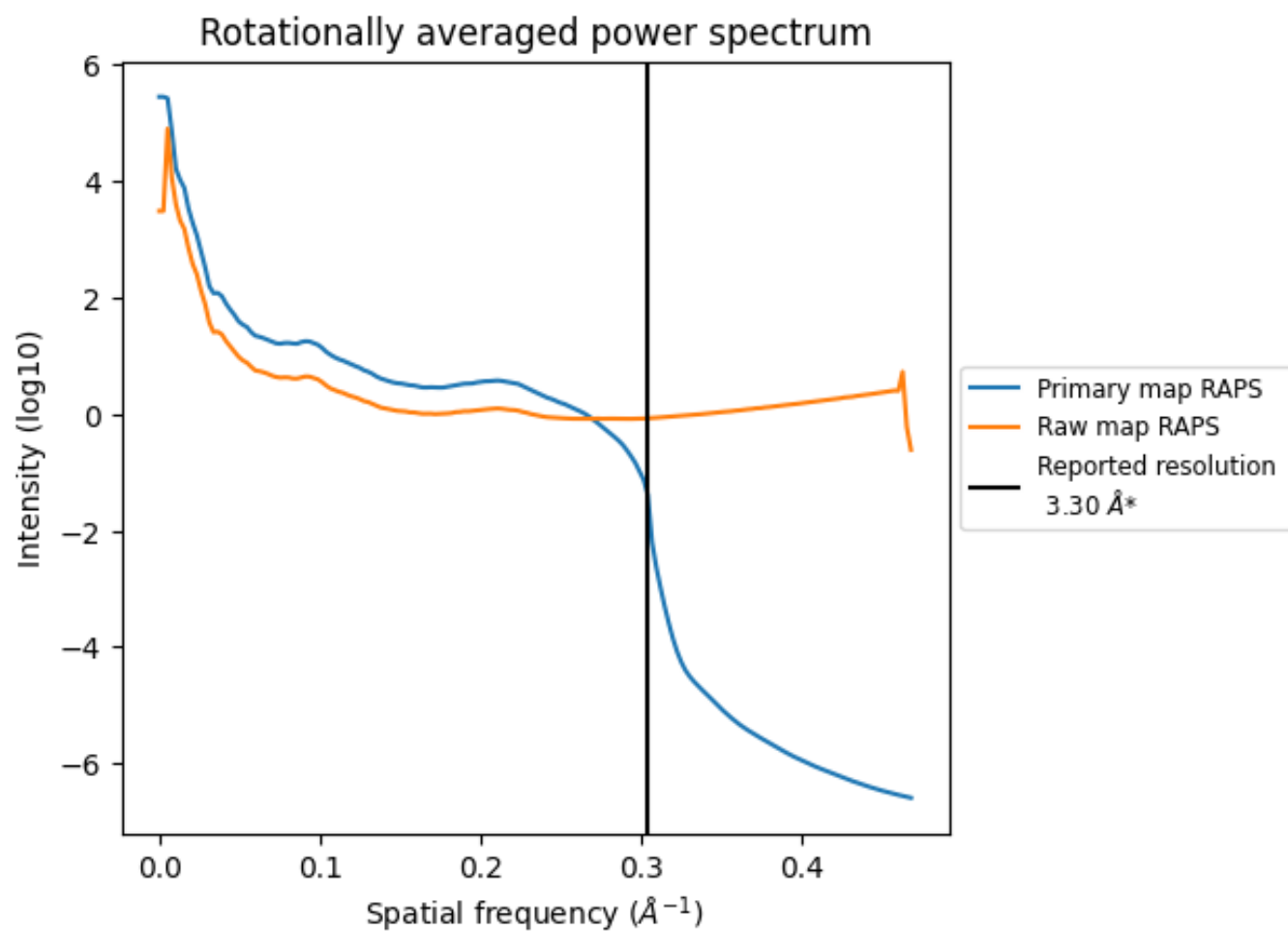
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 301 nm³; this corresponds to an approximate mass of 272 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 ⓘ

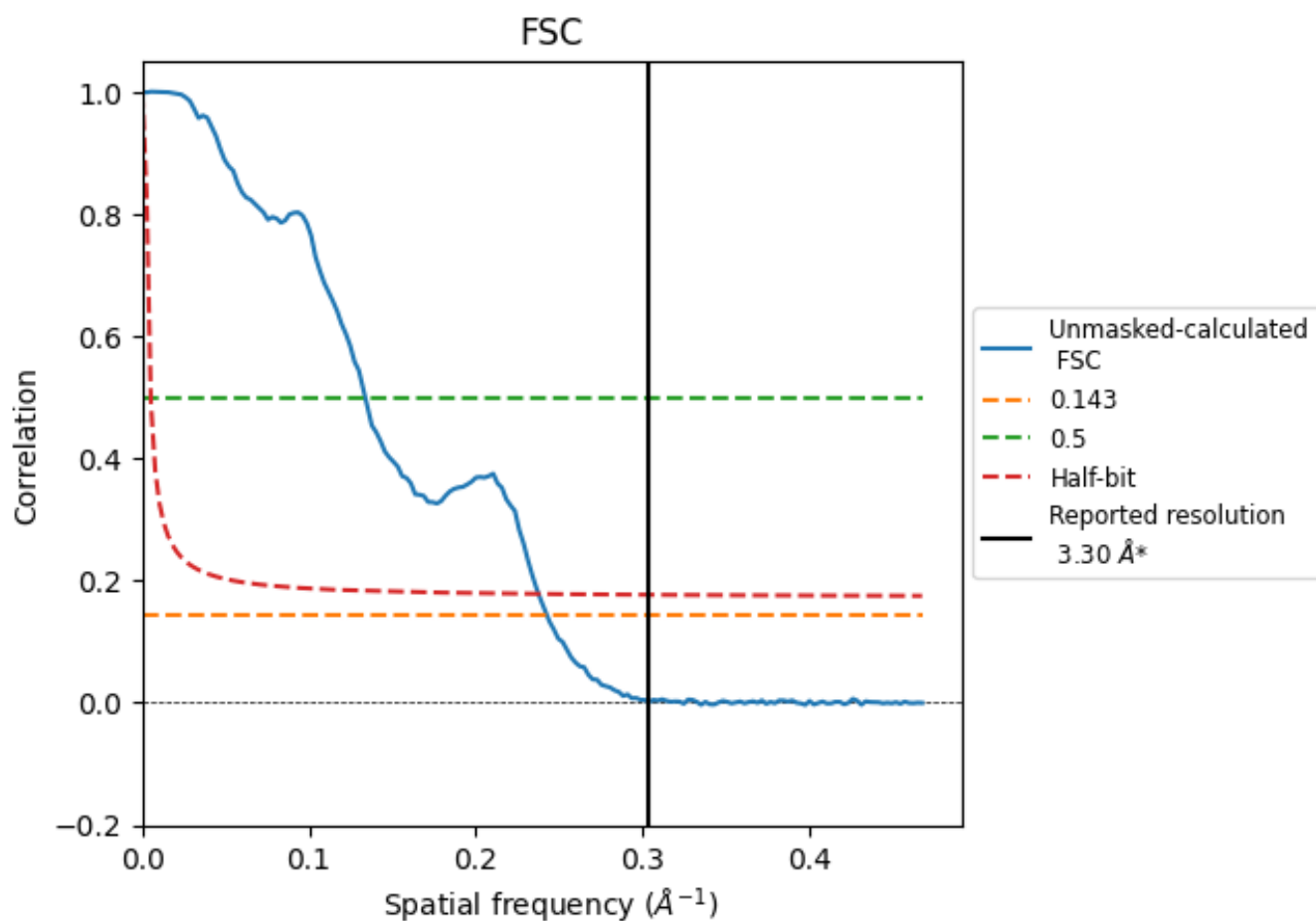


*Reported resolution corresponds to spatial frequency of 0.303 \AA^{-1}

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 0.303 Å⁻¹

8.2 Resolution estimates [i](#)

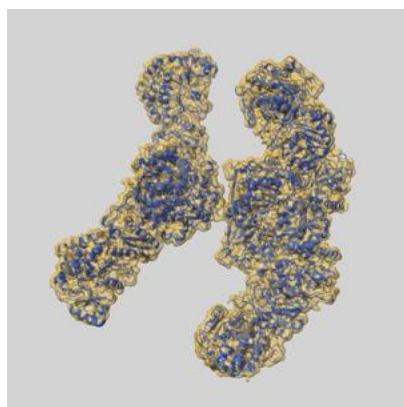
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.12	7.48	4.21

*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 4.12 differs from the reported value 3.3 by more than 10 %

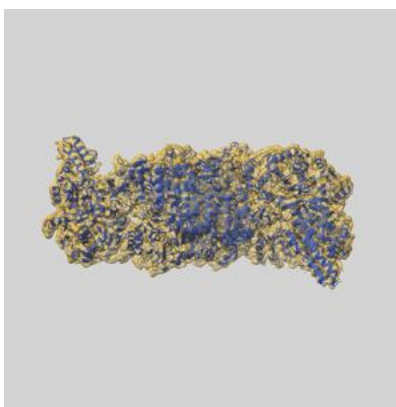
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-43350 and PDB model 8VM0. Per-residue inclusion information can be found in [section 3](#) on [page 7](#).

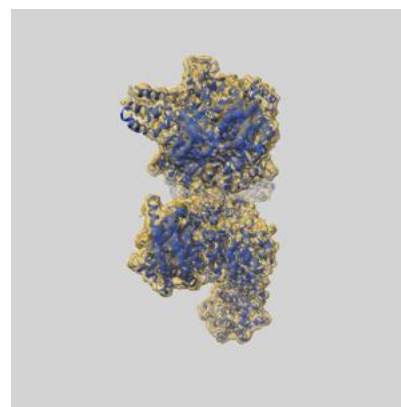
9.1 Map-model overlay [i](#)



X



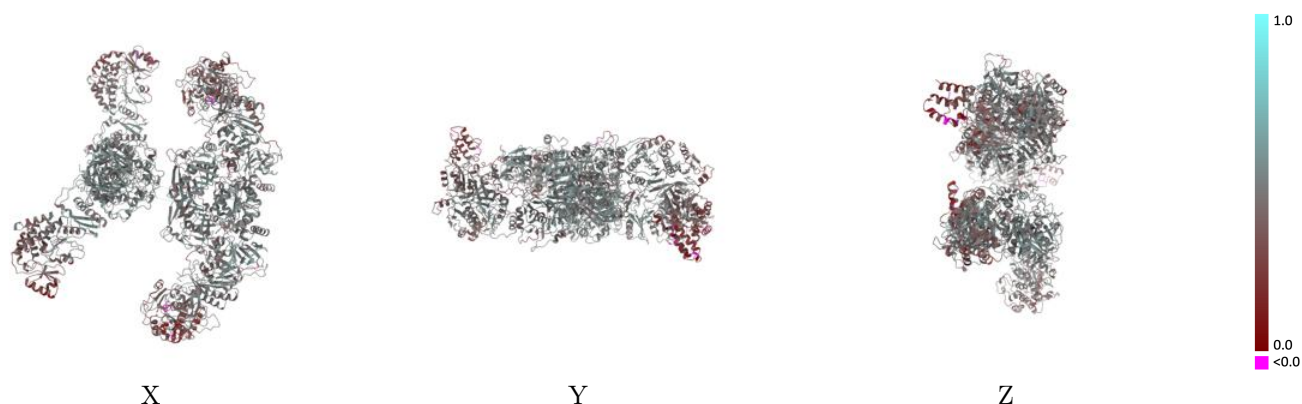
Y



Z

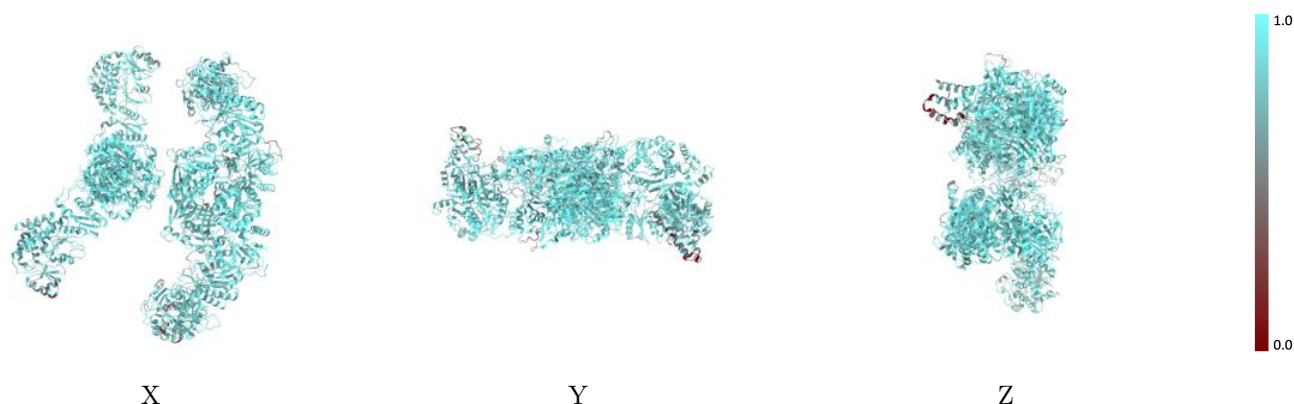
The images above show the 3D surface view of the map at the recommended contour level 0.182 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



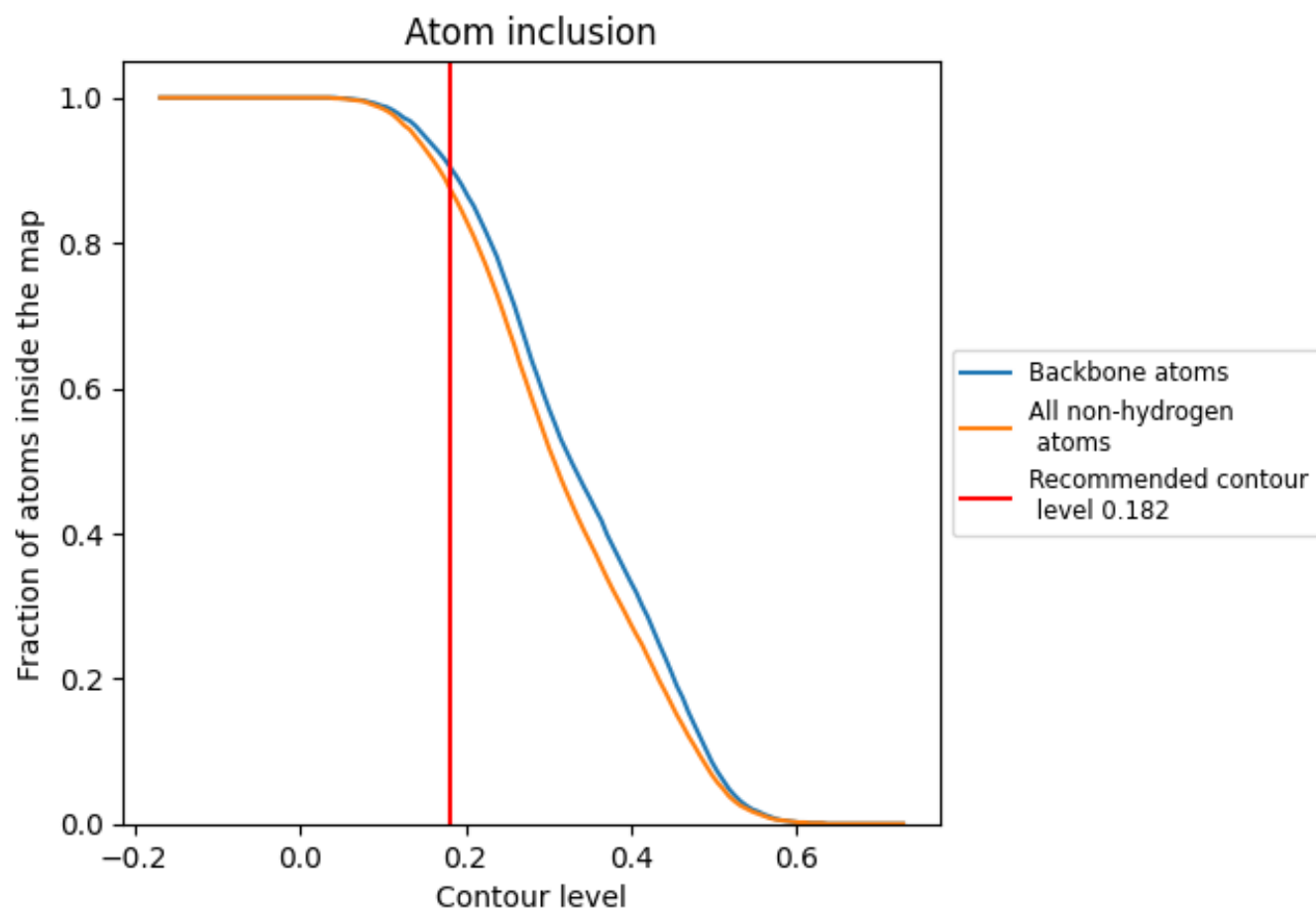
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.182).

9.4 Atom inclusion [i](#)



At the recommended contour level, 90% of all backbone atoms, 87% 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 (0.182) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.8730	<div></div> 0.4530
A	<div></div> 0.8790	<div></div> 0.4560
B	<div></div> 0.8660	<div></div> 0.4510

