



wwPDB EM Validation Summary Report ⓘ

Dec 18, 2022 – 01:34 am GMT

PDB ID : 6ZWM
EMDB ID : EMD-11488
Title : cryo-EM structure of human mTOR complex 2, overall refinement
Authors : Scaiola, A.; Mangia, F.; Inseng, S.; Boehringer, D.; Ban, N.; Maier, T.
Deposited on : 2020-07-28
Resolution : 3.20 Å (reported)

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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.dev43
Mogul : 1.8.4, 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) : 2.31.3

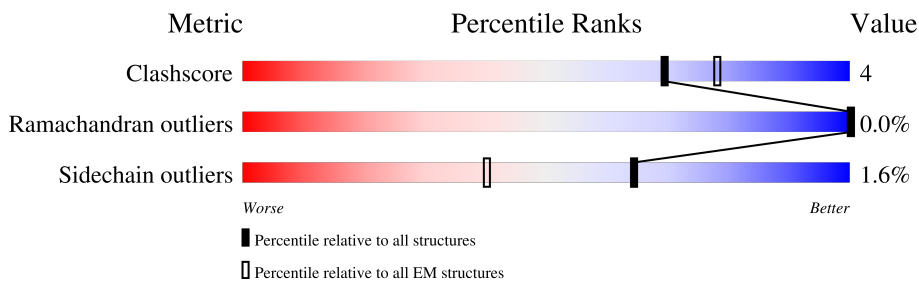
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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	2549	15% (red), 78% (green), 8% (yellow), 14% (grey)
1	B	2549	17% (red), 79% (green), 7% (yellow), 14% (grey)
2	C	326	17% (red), 79% (green), 19% (yellow), 5% (grey)
2	D	326	9% (red), 81% (green), 17% (yellow), 5% (grey)
3	E	1708	15% (red), 57% (green), 8% (yellow), 35% (grey)
3	F	1708	5% (red), 58% (green), 7% (yellow), 35% (grey)
4	G	522	10% (red), 18% (green), 81% (grey)
4	H	522	5% (red), 17% (green), 81% (grey)

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 56947 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 Serine/threonine-protein kinase mTOR.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2184	Total	C	N	O	S	0	0
			16337	10356	2906	2977	98		
1	B	2185	Total	C	N	O	S	0	0
			16304	10330	2904	2972	98		

- Molecule 2 is a protein called Target of rapamycin complex subunit LST8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	319	Total	C	N	O	S	0	0
			2465	1533	437	477	18		
2	D	319	Total	C	N	O	S	0	0
			2465	1533	437	477	18		

- Molecule 3 is a protein called Rapamycin-insensitive companion of mTOR.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	E	1117	Total	C	N	O	S	0	0
			8931	5689	1584	1611	47		
3	F	1117	Total	C	N	O	S	0	0
			8931	5689	1584	1611	47		

- Molecule 4 is a protein called Target of rapamycin complex 2 subunit MAPKAP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	G	98	Total	C	N	O	S	0	0
			655	399	125	127	4		
4	H	98	Total	C	N	O	S	0	0
			655	399	125	127	4		

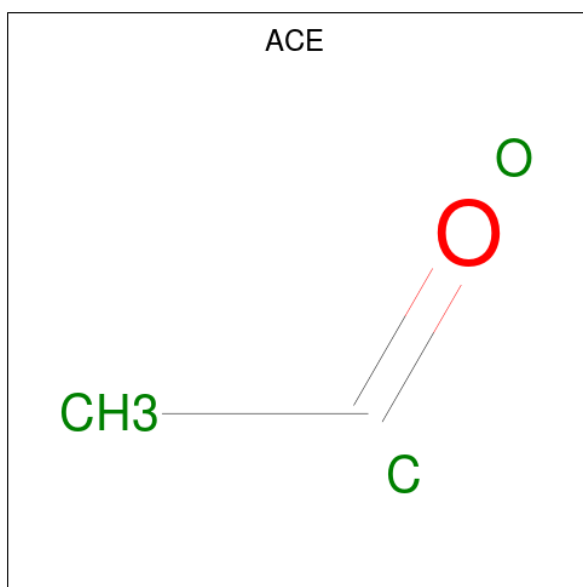
- Molecule 5 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (three-letter code: AGS) (formula: C₁₀H₁₆N₅O₁₂P₃S) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	O	P	0
			36	6	24	6	
6	B	1	Total	C	O	P	0
			36	6	24	6	

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
7	E	1	Total	Zn	0
			1	1	
7	F	1	Total	Zn	0
			1	1	

- Molecule 8 is ACETYL GROUP (three-letter code: ACE) (formula: C₂H₄O).

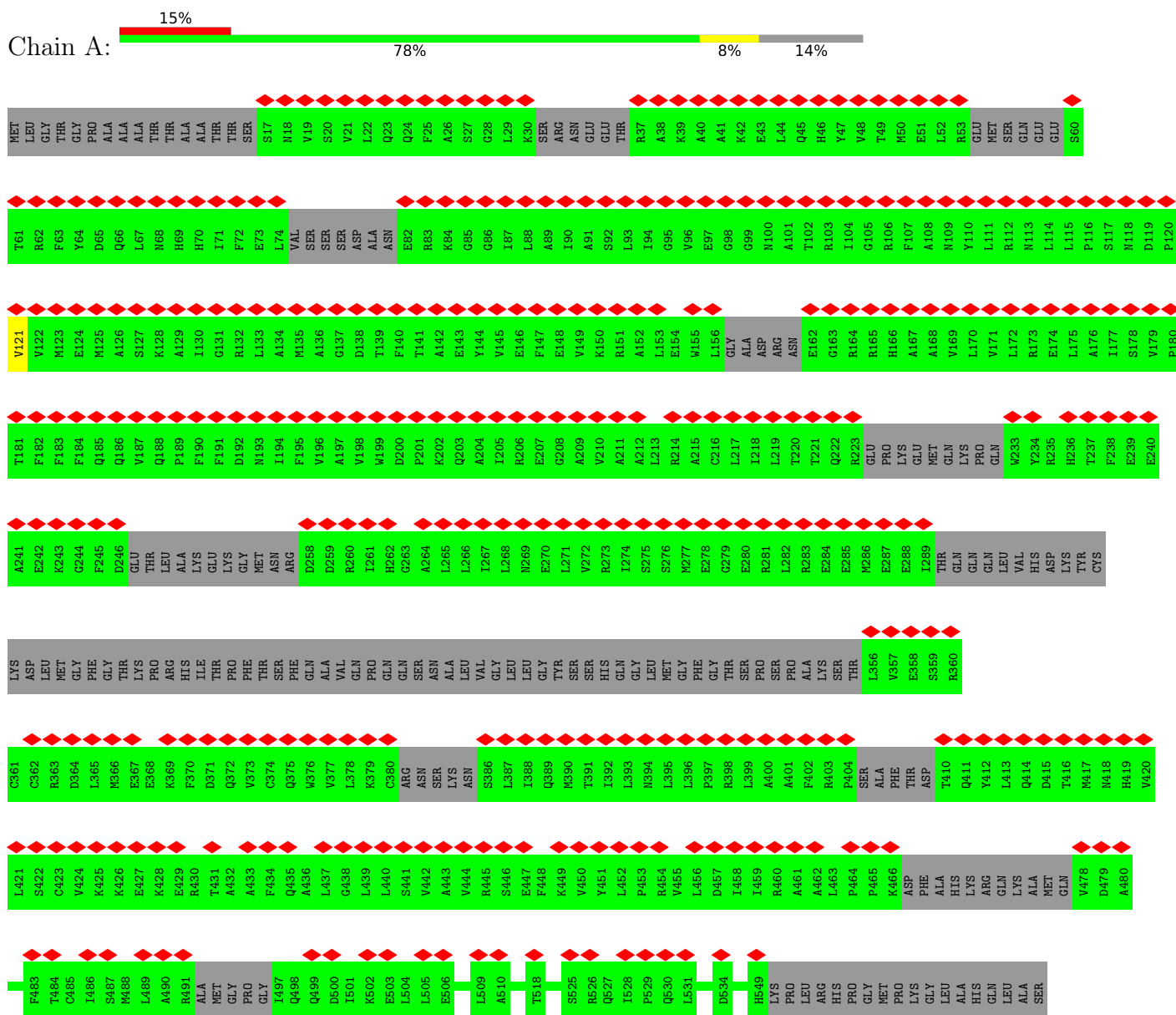


Mol	Chain	Residues	Atoms			AltConf
8	G	1	Total	C	O	0
			3	2	1	
8	H	1	Total	C	O	0
			3	2	1	

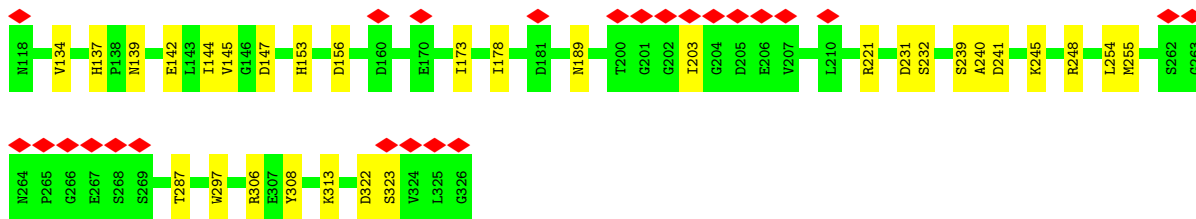
3 Residue-property plots

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.

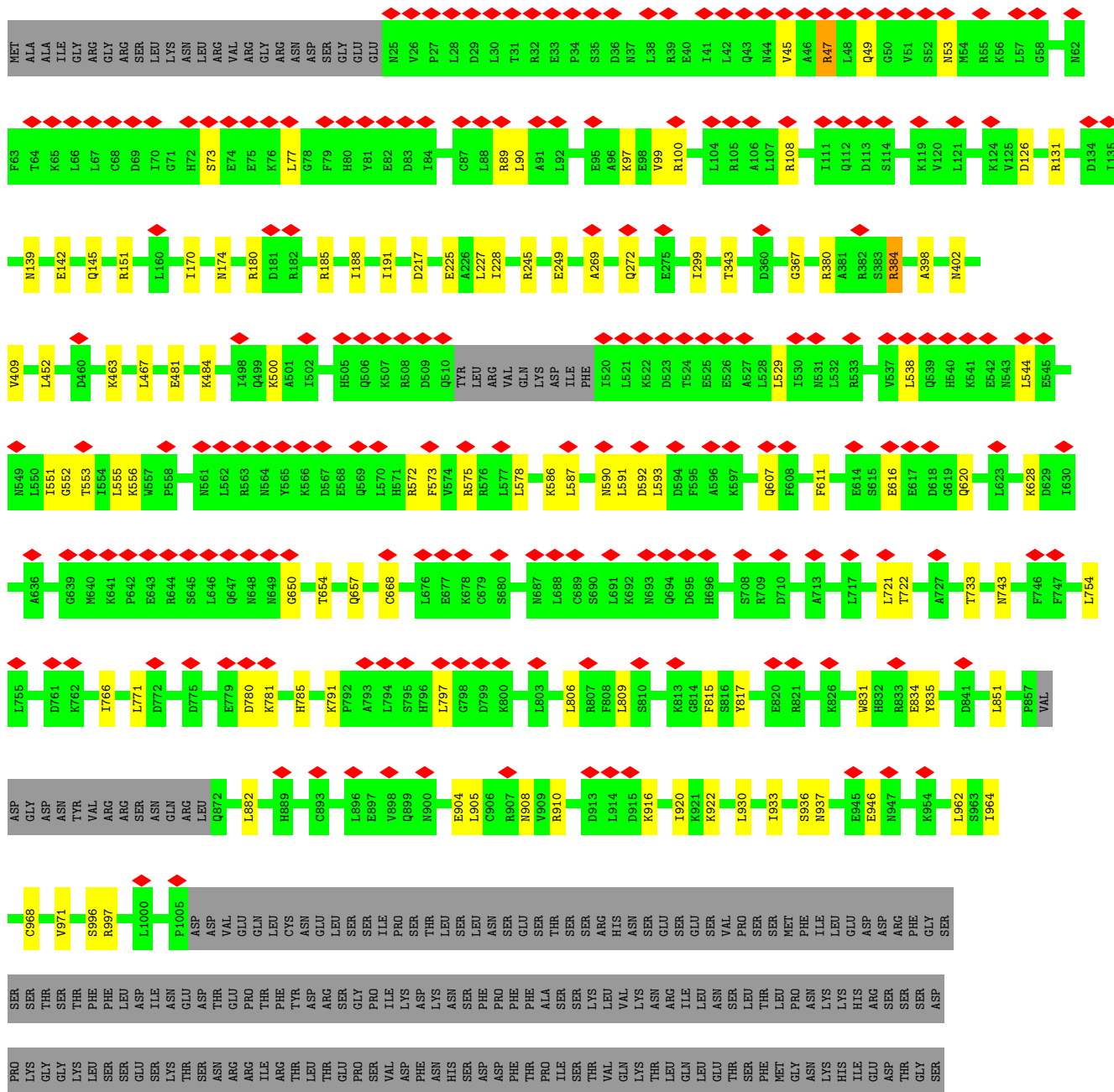
- Molecule 1: Serine/threonine-protein kinase mTOR



T61	R62	F63	Y64	D65	Q66	L67	N68	H69	H70	I71	F72	E73	L74	VAL	SER	SER	SER	SER	ASP	ASP	ALA	ASN	E82	R83	K84	G85	G86	I87	L88	A89	I90	A91	S92	L93	I94	G95	V96	E97	G98	G99	N100	A101	R103	I104	G105	R106	F107	A108	N109	Y110	L111	R112	N113	L114	L115	P116	S117	D119	P120
V121	V122	M123	E124	M125	A126	S127	K128	A129	I130	G131	R132	L133	A134	M135	A136	G137	D138	T139	F140	T141	A142	E143	Y144	V145	A146	F147	E148	I149	K150	R151	A152	L153	E154	W155	L156	GLY	ALA	ASP	ARG	ASN	E162	G163	R164	R165	H166	A167	A168	V169	L170	V171	L172	R173	E174	L175	A176	I177	S178	V179	P180
T181	F182	F183	F184	Q185	Q186	V187	Q188	P189	F190	F191	D192	N193	I194	F195	V196	A197	V198	W199	D200	P201	K202	Q203	A204	I205	R206	E207	G208	A209	V210	A211	A212	L213	R214	A215	C216	L217	I218	L219	T220	Q221	R222	R223	GLU	PRO	LYS	GLU	MET	GLN	PRO	GLN	W233	Y234	R235	E174	H236	T237	F238	E239	E240
A241	E242	K243	G244	L245	D246	GLU	THR	LEU	ALA	LYS	GLU	GLY	MET	ASN	D258	D259	R260	I261	H262	G263	A264	L265	L266	I267	L268	N269	E270	L271	V272	R273	I274	S275	S276	M277	E278	G279	E280	R281	L282	R283	E284	E285	M286	E287	E288	I289	THR	GLN	GLN	LEU	VAL	HIS	ASP	LYS	TYR	CYS			
LYS	ASP	LEU	MET	GLY	PHE	GLY	THR	PRO	ARG	ALA	LYS	ILE	THR	PRO	PHE	THR	SER	SER	PHE	GLN	ALA	VAL	GLY	LEU	LEU	GLY	TYR	SER	SER	HIS	GLN	GLY	LYS	MET	PHE	GLY	THR	PRO	SER	PRO	PRO	ALA	LYS	SER	THR	L356	V357	E358	S359	R360									
C361	C362	R363	D364	L365	M366	E367	E368	K369	F370	D371	Q372	V373	C374	Q375	W376	V377	L378	K379	C380	ARG	ASN	LYS	VAL	GLY	L387	I388	Q389	M390	T391	I392	L393	N394	L395	L396	P397	R398	L399	A400	A401	F402	R403	P404	SER	ALA	PHE	THR	ASP	T410	Q411	Y412	L413	Q414	D415	T416	M417	M418	H419	V420	
L421	S422	C423	V424	K425	K426	E427	K428	E429	R430	T431	A432	F433	Q435	A436	L437	G438	L439	L440	S441	V442	A443	V444	R445	S446	E447	F448	K449	V450	Y451	L452	P453	R454	V455	L456	D457	T458	I459	R460	A461	A462	L463	P464	P465	K466	ASP	PHE	ALA	HIS	LYS	ARG	GLN	LYS	ALA	MET	GLN	V478	D479	A480	
T481	V482	F483	T484	C485	I486	S487	M488	L489	A490	B491	ALA	GLY	PRO	GLY	T497	Q498	Q499	D500	I501	K502	E503	L504	L505	E506	P507	M508	L509	A510	V511	G512	L513	S514	P515	T518	D523	L524	S525	A526	Q527	L528	P529	Q530	L531	K532	K533	D534	I535	G538	M542	L545	V546	L547	M548						
H549	LYS	PRO	LEU	ARG	HIS	PRO	GLY	MET	PRO	ALA	ALA	HIS	GLN	LEU	ALA	SER	PRO	THR	LEU	PRO	GLU	ALA	SER	D578	G590	S591	F592	E593	F594	S719	S720	P723	L724	F725	V726	M727	L738	E751	V761	R766	L767	I768	L775	L776	L779	L780	L781	ILE	HIS										
LEU	ILE	SER	GLY	HIS	ALA	VAL	V644	S645	D646	V652	L656	L659	V662	L676	L679	D684	L687	Q694	E709	L710	R717	L718	S720	P723	M724	F725	V726	M727	L738	E751	V761	R766	L767	I768	L775	L776	L779	L780	L781	ILE	HIS																		
D785	F786	ASP	PRO	ASP	PRO	H791	P792	G793	V794	V798	T801	L805	F821	D830	S831	S832	L833	L834	A835	Y853	V854	P857	Y858	R859	K860	T863	L872	L888	F889	L890	A893	L903	GLY	MET	ILE	ASP	GLN	SER	ARG	ASP	ALA	ALA	VAL	SER	LEU														
SER	GLU	SER	LYS	SER	ALA	LEU	ASP	SER	S927	D928	K985	C1004	R1009	R1028	P1029	Y1030	M1031	D1032	E1033	I1034	V1035	T1036	M1044	S1047	I1048	Q1049	L1069	R1072	I1075	L1079	L1097	L1107	L1113	P1116	P1117	I1118	V1119	T1138	D1150	S1153	R1238																		
SER	GLY	GLN	ASP	ALA	LEU	ALA	SER	PRO	PRO	VAL	THR	GLY	PRO	LYS	LYS	HIS	VAL	THR	I1263	K1267	G1270	A1271	R1274	V1275	S1276	K1277	S1295	A1307	A1314	S1324	Q1348	T1354	L1372	P1373	L1416	N1420	N1421	K1422	Q1425	Y1435																			



• Molecule 3: Rapamycin-insensitive companion of mTOR



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	293038	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	70	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	3.323	Depositor
Minimum map value	-1.756	Depositor
Average map value	-0.002	Depositor
Map value standard deviation	0.077	Depositor
Recommended contour level	0.375	Depositor
Map size (Å)	430.08, 430.08, 430.08	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.344, 1.344, 1.344	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: AGS, IHP, ZN, ACE

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	0.27	0/16632	0.49	3/22593 (0.0%)
1	B	0.26	0/16598	0.47	3/22552 (0.0%)
2	C	0.28	0/2523	0.58	0/3438
2	D	0.27	0/2523	0.58	0/3438
3	E	0.28	0/9092	0.53	1/12300 (0.0%)
3	F	0.26	0/9092	0.50	1/12300 (0.0%)
4	G	0.27	0/660	0.54	0/900
4	H	0.25	0/660	0.50	0/900
All	All	0.27	0/57780	0.50	8/78421 (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
3	E	0	1

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1107	LEU	CA-CB-CG	6.75	130.82	115.30
1	A	1107	LEU	CA-CB-CG	6.75	130.82	115.30
3	F	38	LEU	CA-CB-CG	6.51	130.28	115.30
3	E	529	LEU	CA-CB-CG	6.08	129.28	115.30
1	B	659	LEU	CA-CB-CG	5.74	128.49	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	E	367	GLY	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	16337	0	15369	110	0
1	B	16304	0	15298	97	0
2	C	2465	0	2351	33	0
2	D	2465	0	2351	33	0
3	E	8931	0	9080	80	0
3	F	8931	0	9080	69	0
4	G	655	0	519	2	0
4	H	655	0	519	6	0
5	A	31	0	12	1	0
5	B	31	0	12	0	0
5	E	31	0	12	1	0
5	F	31	0	12	1	0
6	A	36	0	6	2	0
6	B	36	0	6	2	0
7	E	1	0	0	0	0
7	F	1	0	0	0	0
8	G	3	0	3	0	0
8	H	3	0	3	0	0
All	All	56947	0	54633	413	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 4.

The worst 5 of 413 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)
3:E:552:GLY:O	3:E:556:LYS:HB2	1.75	0.87
3:E:920:ILE:HG23	3:E:964:ILE:HD11	1.75	0.69
1:A:1211:VAL:HA	3:E:553:THR:HG21	1.75	0.67
3:E:555:LEU:HD11	3:E:607:GLN:HG3	1.76	0.66
2:D:134:VAL:HG12	2:D:145:VAL:HG12	1.82	0.62

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	2143/2549 (84%)	2080 (97%)	62 (3%)	1 (0%)	100	100
1	B	2145/2549 (84%)	2071 (97%)	73 (3%)	1 (0%)	100	100
2	C	317/326 (97%)	299 (94%)	18 (6%)	0	100	100
2	D	317/326 (97%)	291 (92%)	26 (8%)	0	100	100
3	E	1103/1708 (65%)	1066 (97%)	37 (3%)	0	100	100
3	F	1103/1708 (65%)	1067 (97%)	36 (3%)	0	100	100
4	G	94/522 (18%)	86 (92%)	8 (8%)	0	100	100
4	H	94/522 (18%)	85 (90%)	9 (10%)	0	100	100
All	All	7316/10210 (72%)	7045 (96%)	269 (4%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	121	VAL
1	A	121	VAL

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	1563/2220 (70%)	1541 (99%)	22 (1%)	67	86

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	1552/2220 (70%)	1524 (98%)	28 (2%)	59	82
2	C	269/276 (98%)	260 (97%)	9 (3%)	38	71
2	D	269/276 (98%)	262 (97%)	7 (3%)	46	76
3	E	987/1539 (64%)	977 (99%)	10 (1%)	76	90
3	F	987/1539 (64%)	976 (99%)	11 (1%)	73	88
4	G	50/471 (11%)	49 (98%)	1 (2%)	55	80
4	H	50/471 (11%)	48 (96%)	2 (4%)	31	66
All	All	5727/9012 (64%)	5637 (98%)	90 (2%)	64	84

5 of 90 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	306	ARG
3	E	611	PHE
2	D	27	TRP
2	D	308	TYR
3	E	1516	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 60 such sidechains are listed below:

Mol	Chain	Res	Type
2	C	41	GLN
3	F	848	ASN
3	E	219	GLN
3	F	539	GLN
4	G	107	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](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 for Mogul analysis.

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
6	IHP	B	2602	-	36,36,36	1.47	3 (8%)	54,60,60	1.03	5 (9%)
8	ACE	H	601	4	1,2,2	0.70	0	1,1,1	0.30	0
5	AGS	E	4802	-	26,33,33	1.89	6 (23%)	26,52,52	2.07	7 (26%)
8	ACE	G	601	4	1,2,2	0.79	0	1,1,1	0.23	0
5	AGS	A	2601	-	26,33,33	1.84	6 (23%)	26,52,52	2.05	7 (26%)
5	AGS	B	2601	-	26,33,33	1.85	6 (23%)	26,52,52	2.03	7 (26%)
5	AGS	F	4802	-	26,33,33	1.89	6 (23%)	26,52,52	2.11	7 (26%)
6	IHP	A	2602	-	36,36,36	1.47	3 (8%)	54,60,60	1.04	5 (9%)

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
6	IHP	B	2602	-	-	8/30/54/54	0/1/1/1
5	AGS	E	4802	-	-	1/17/38/38	0/3/3/3
5	AGS	A	2601	-	-	5/17/38/38	0/3/3/3
5	AGS	B	2601	-	-	5/17/38/38	0/3/3/3
5	AGS	F	4802	-	-	1/17/38/38	0/3/3/3
6	IHP	A	2602	-	-	8/30/54/54	0/1/1/1

The worst 5 of 30 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	4802	AGS	C2-N3	5.06	1.40	1.32
5	F	4802	AGS	C2-N3	5.04	1.40	1.32
5	A	2601	AGS	C2-N3	5.01	1.40	1.32
5	B	2601	AGS	C2-N3	4.96	1.40	1.32
5	E	4802	AGS	O4'-C1'	4.45	1.47	1.41

The worst 5 of 38 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	2601	AGS	N3-C2-N1	-6.93	117.85	128.68
5	F	4802	AGS	N3-C2-N1	-6.92	117.86	128.68
5	B	2601	AGS	N3-C2-N1	-6.92	117.87	128.68
5	E	4802	AGS	N3-C2-N1	-6.88	117.93	128.68
5	F	4802	AGS	PA-O3A-PB	-3.45	120.98	132.83

There are no chirality outliers.

5 of 28 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	2601	AGS	PB-O3B-PG-O3G
5	B	2601	AGS	PB-O3B-PG-O3G
5	E	4802	AGS	C5'-O5'-PA-O1A
5	F	4802	AGS	C5'-O5'-PA-O1A
5	A	2601	AGS	PA-O3A-PB-O3B

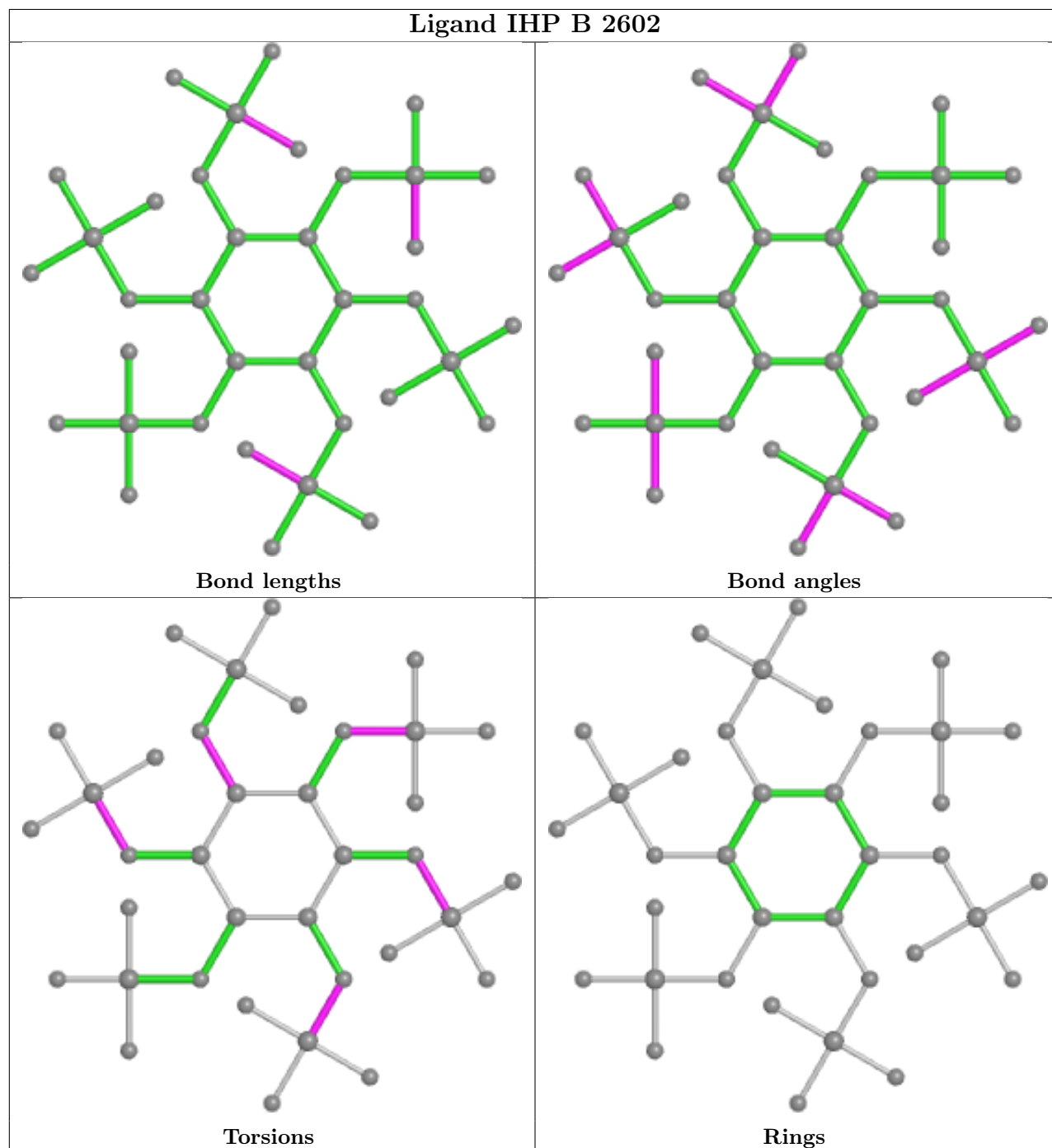
There are no ring outliers.

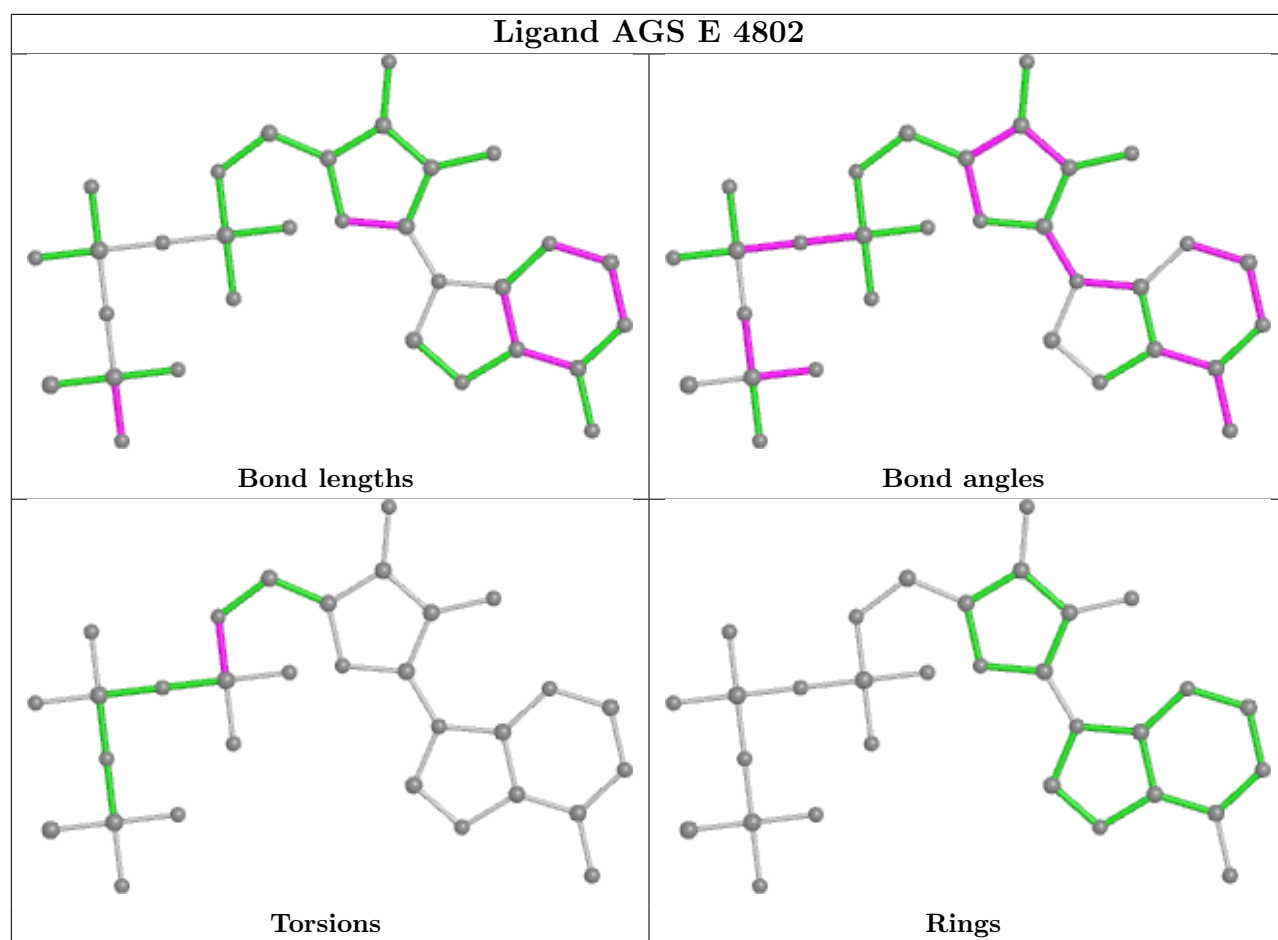
5 monomers are involved in 7 short contacts:

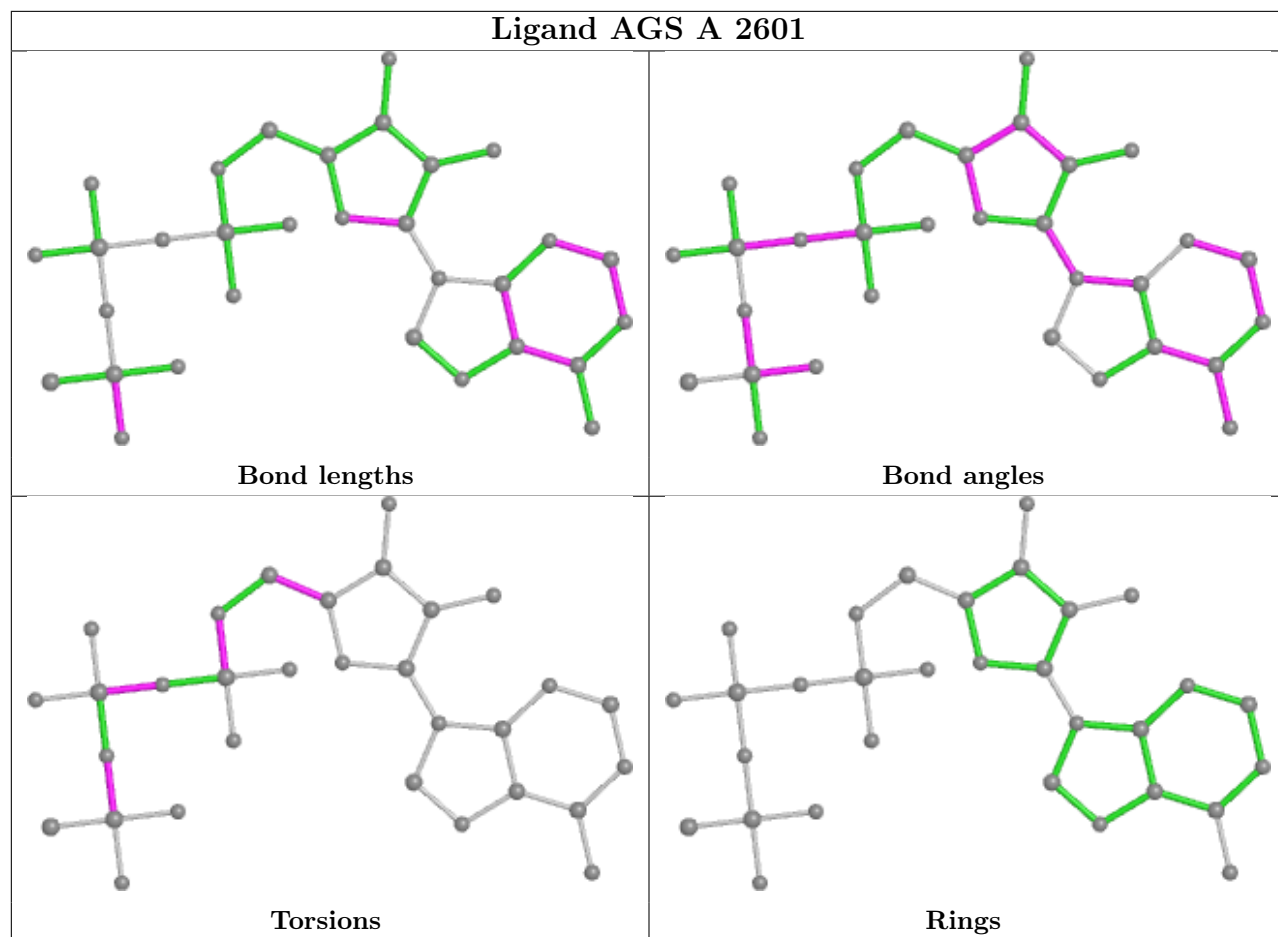
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	2602	IHP	2	0
5	E	4802	AGS	1	0
5	A	2601	AGS	1	0
5	F	4802	AGS	1	0
6	A	2602	IHP	2	0

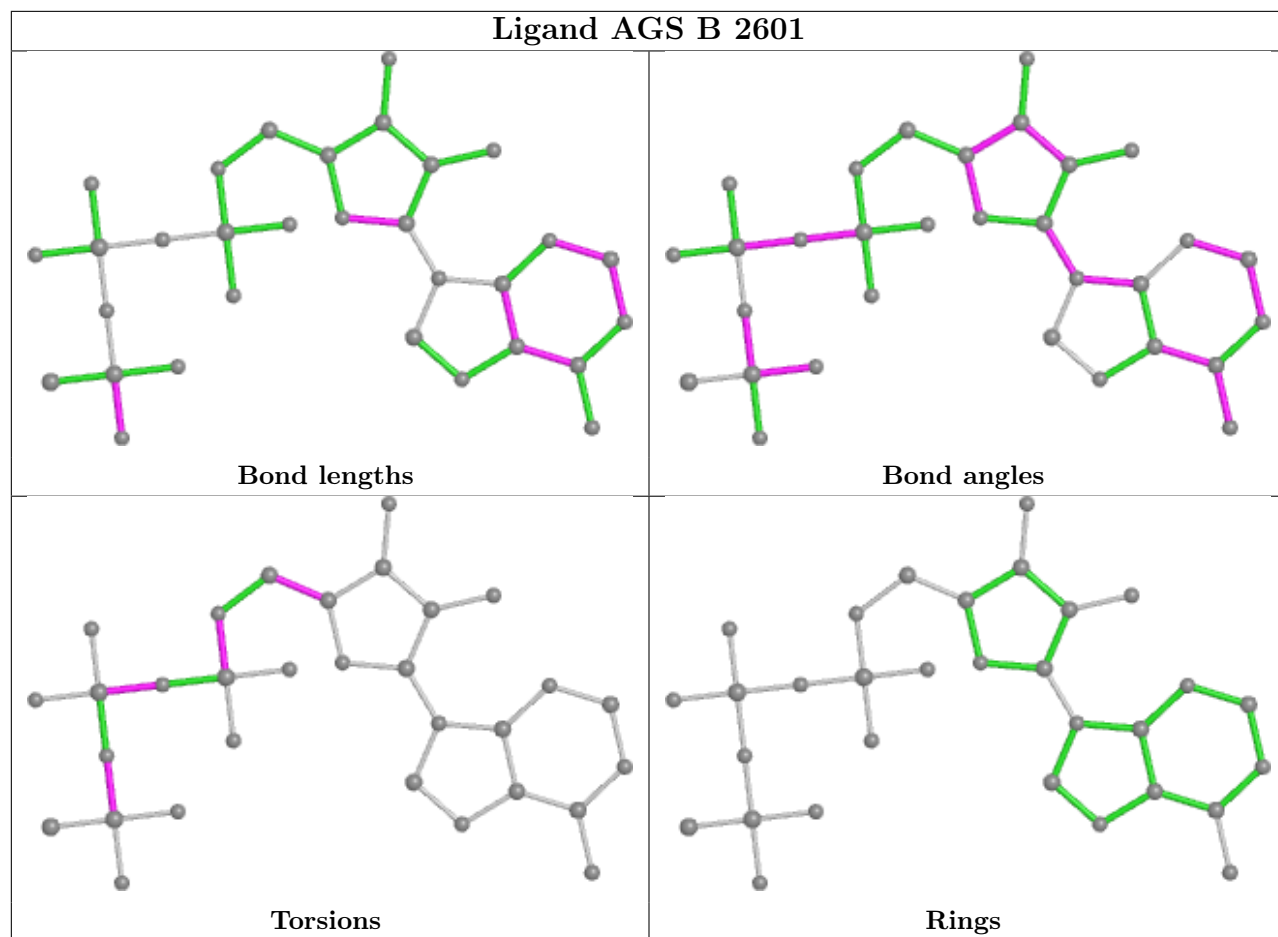
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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

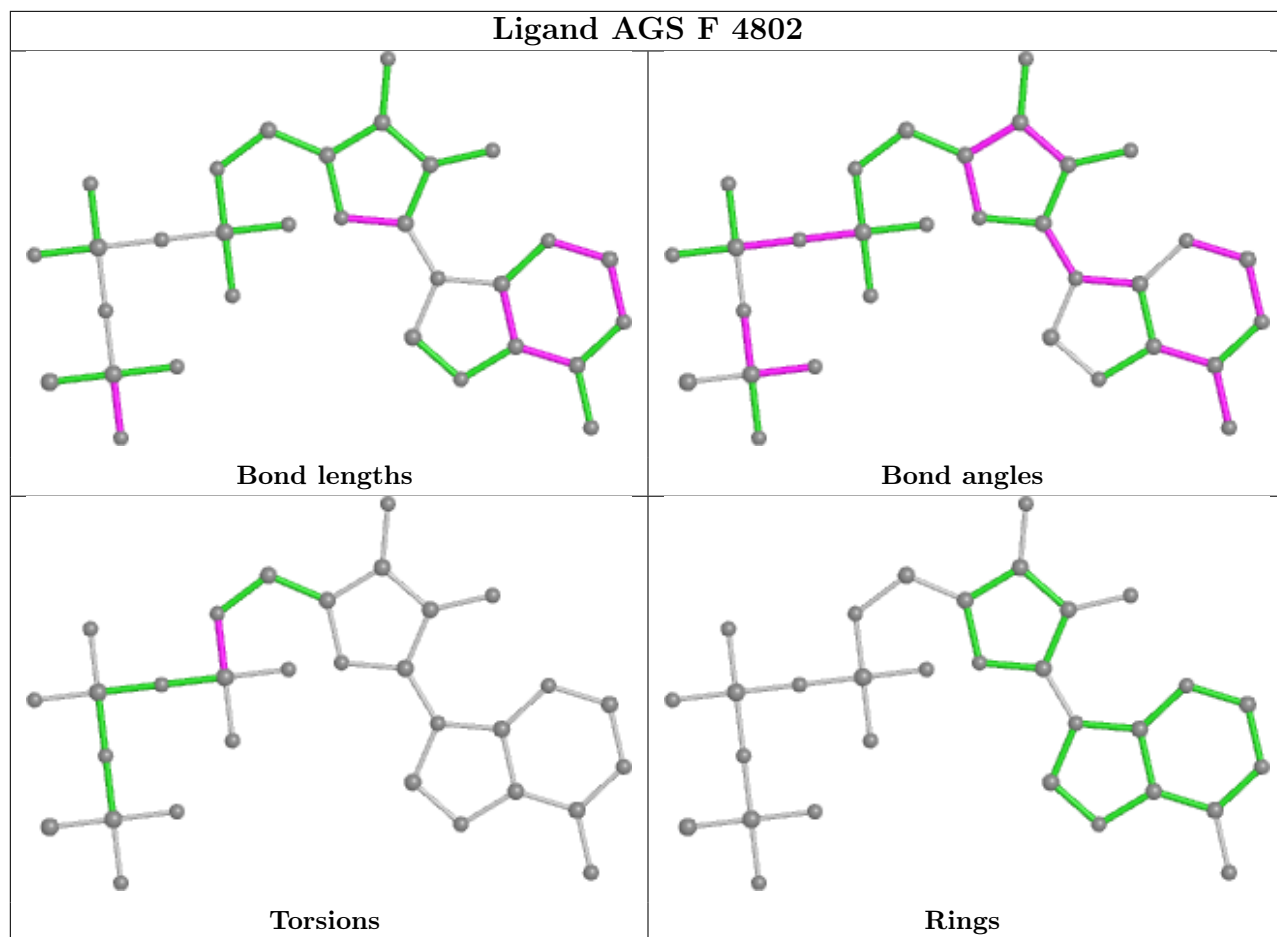
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

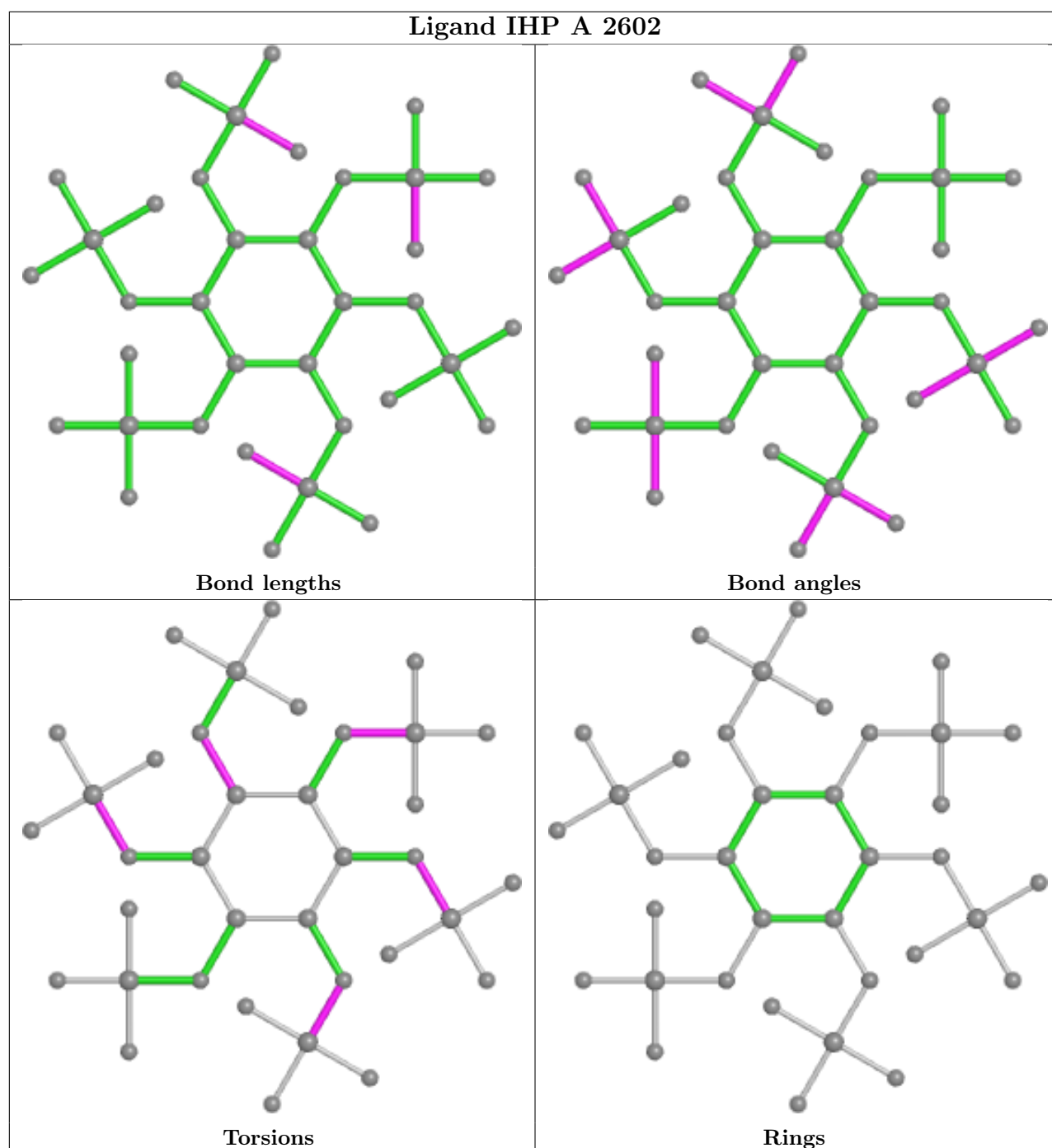












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

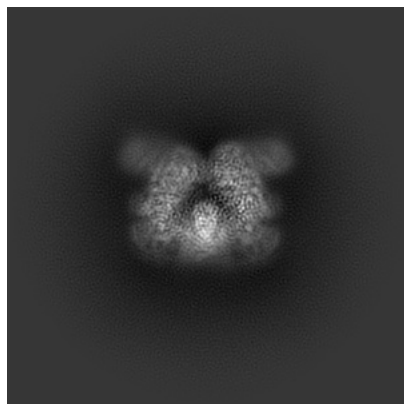
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11488. These allow visual inspection of the internal detail of the map and identification of artifacts.

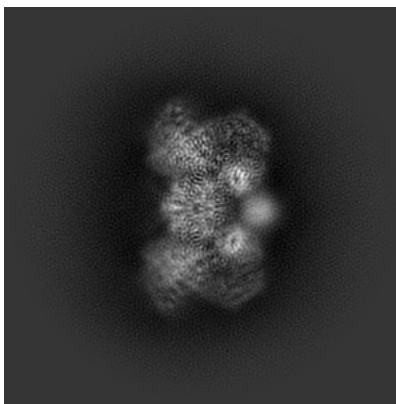
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

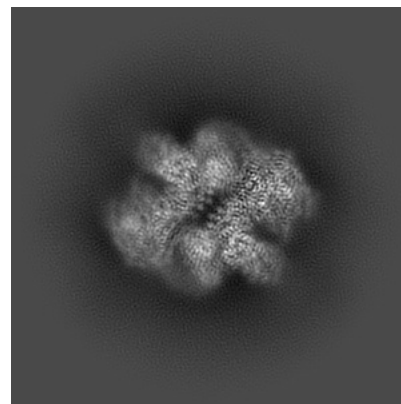
6.1.1 Primary map



X

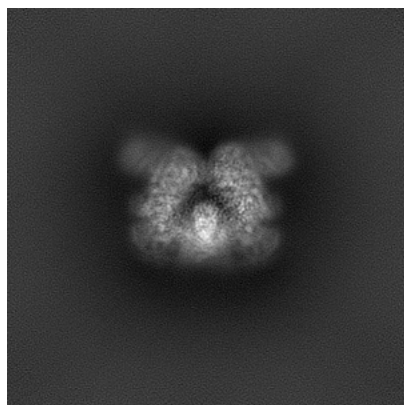


Y

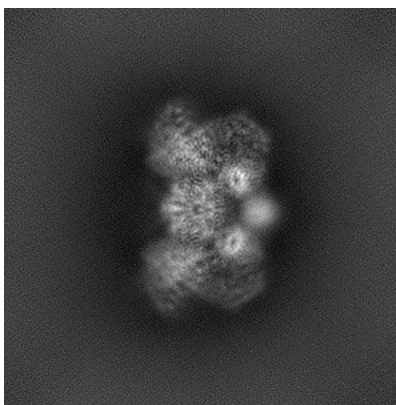


Z

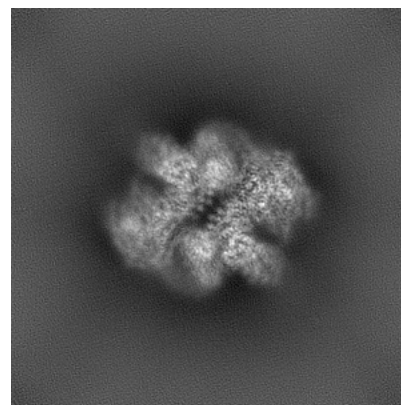
6.1.2 Raw map



X



Y

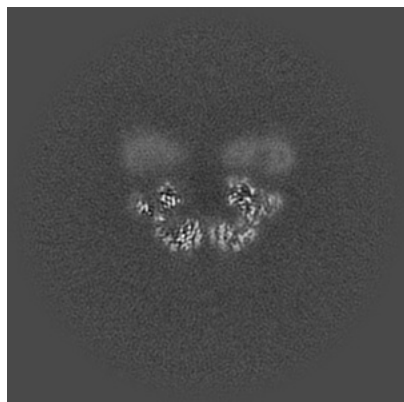


Z

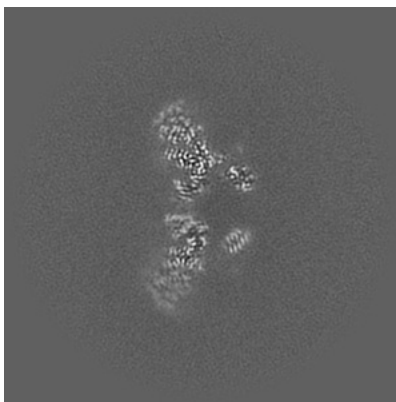
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

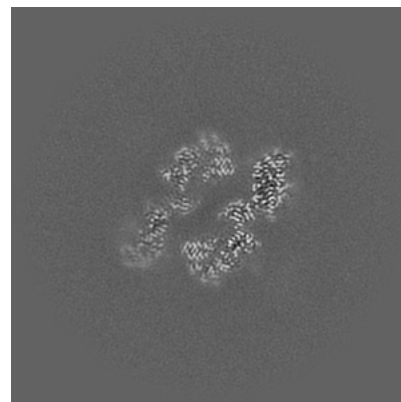
6.2.1 Primary map



X Index: 160

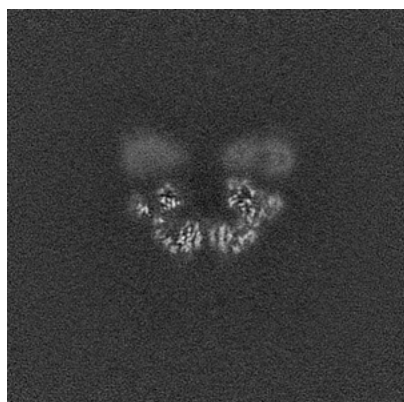


Y Index: 160



Z Index: 160

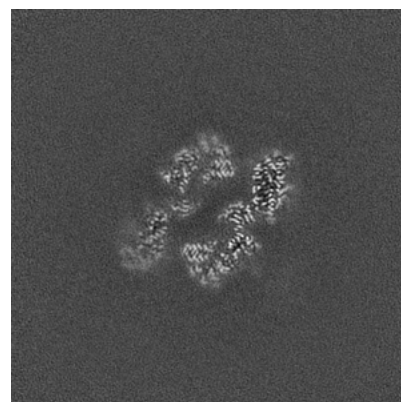
6.2.2 Raw map



X Index: 160



Y Index: 160

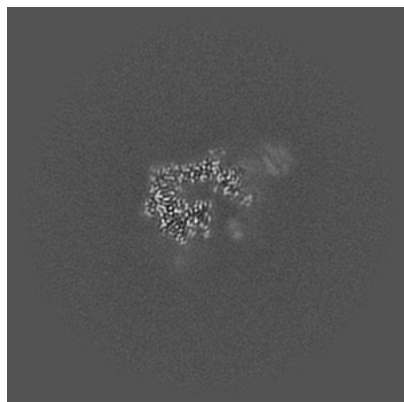


Z Index: 160

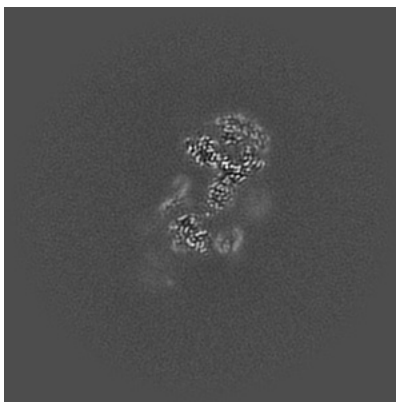
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

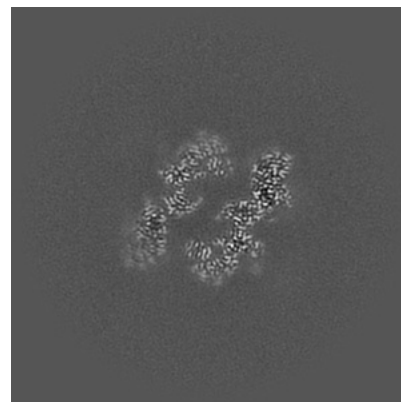
6.3.1 Primary map



X Index: 179

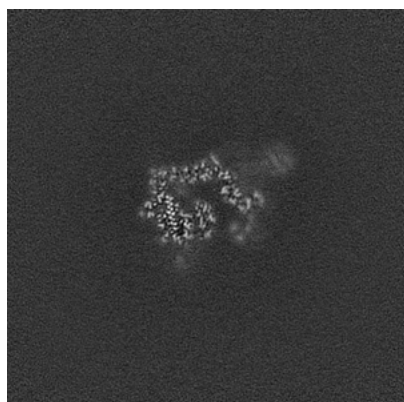


Y Index: 182

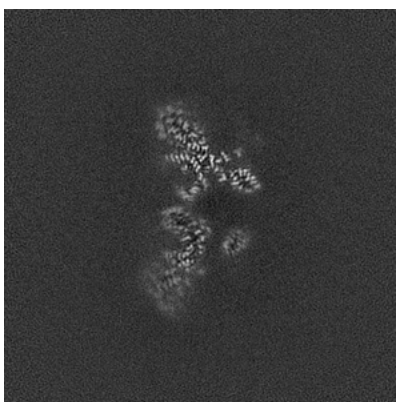


Z Index: 157

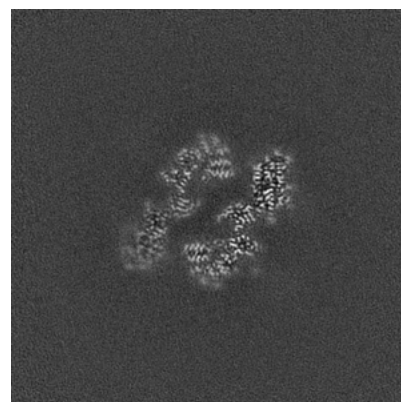
6.3.2 Raw map



X Index: 176



Y Index: 163



Z Index: 159

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

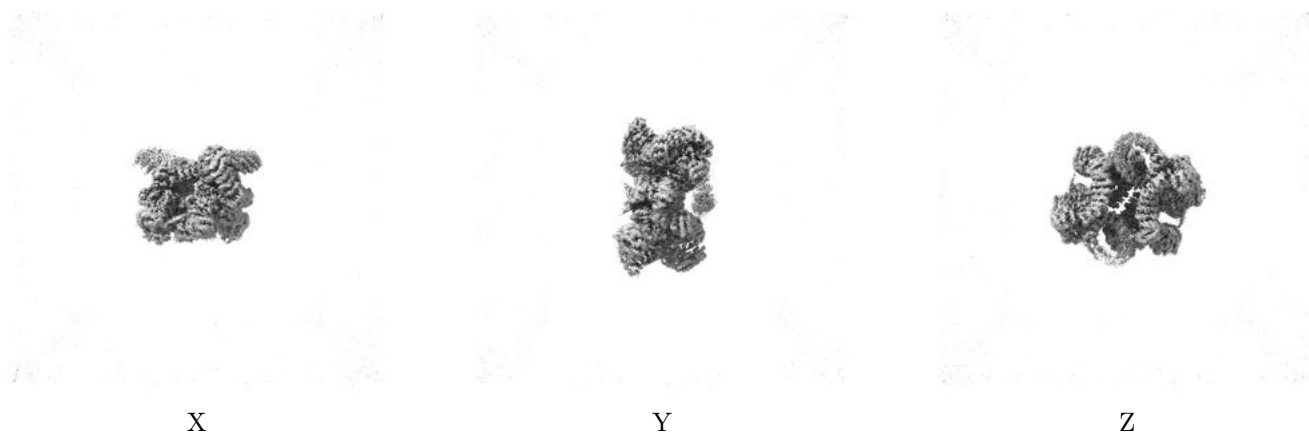
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.375. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 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.

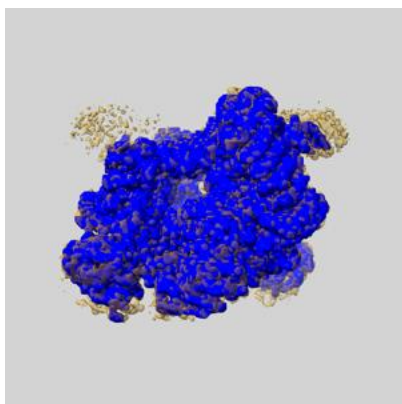
6.5 Mask visualisation [i](#)

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

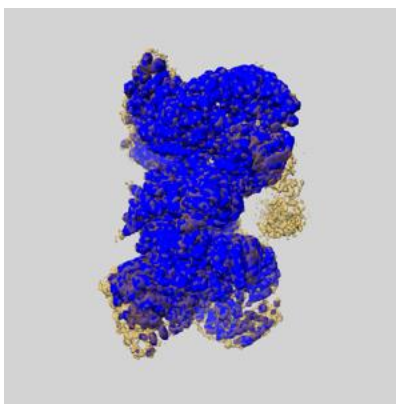
A mask typically either:

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

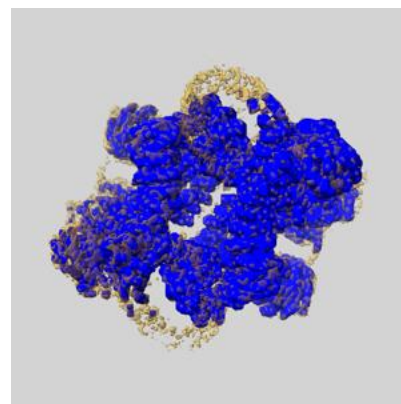
6.5.1 emd_11488_msk_2.map [i](#)



X

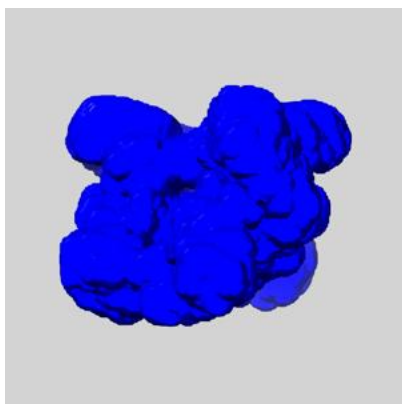


Y

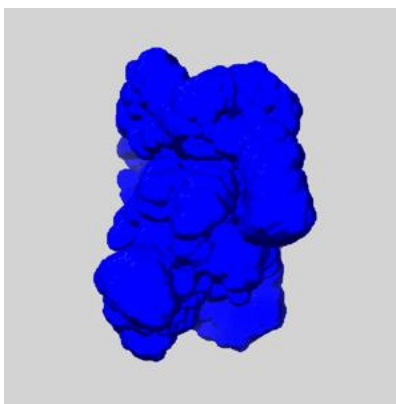


Z

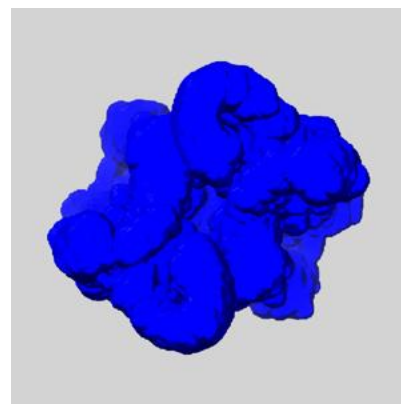
6.5.2 emd_11488_msk_1.map [i](#)



X



Y

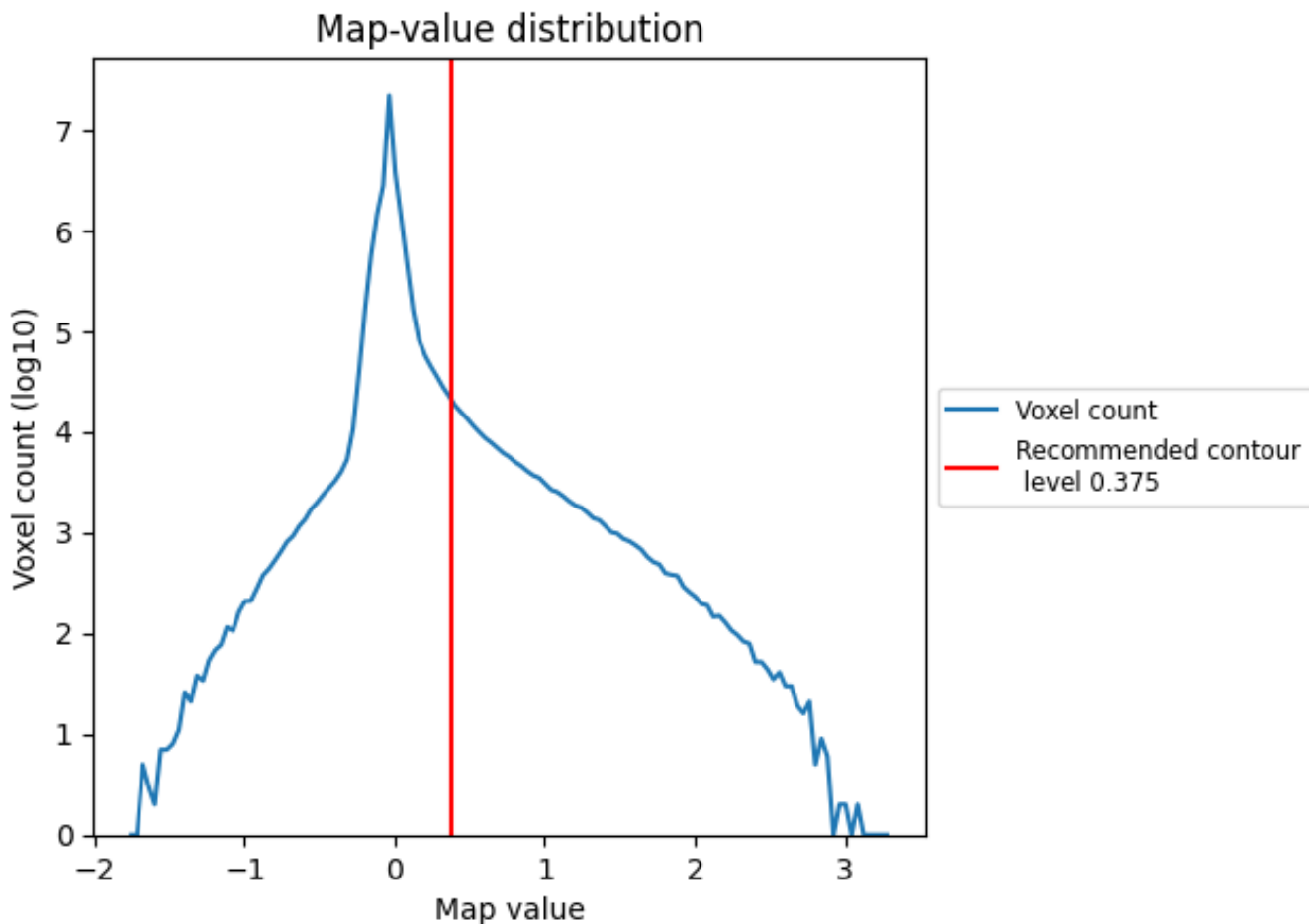


Z

7 Map analysis [i](#)

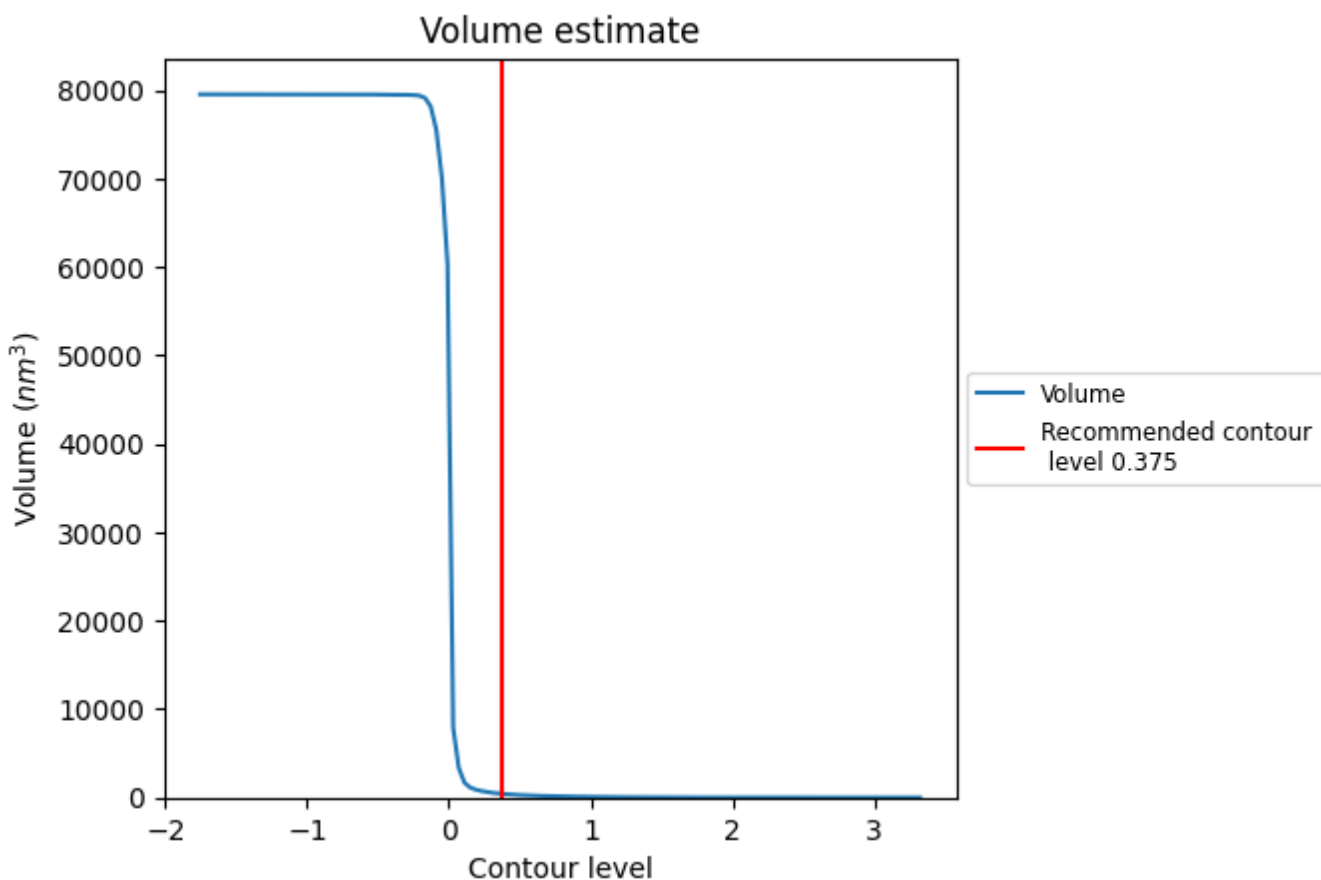
This section contains the results of statistical analysis of the map.

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.

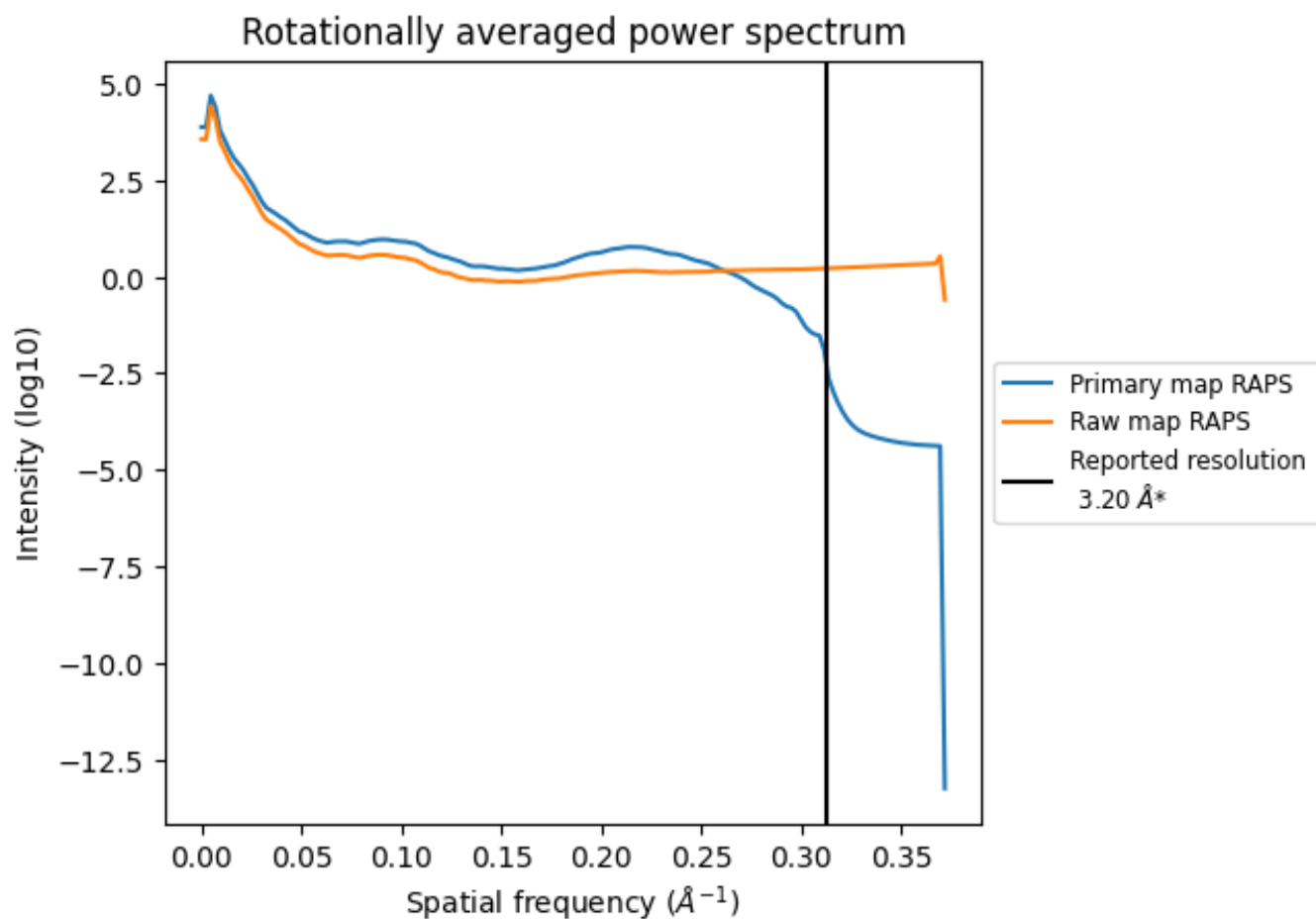
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 419 nm³; this corresponds to an approximate mass of 379 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](#)

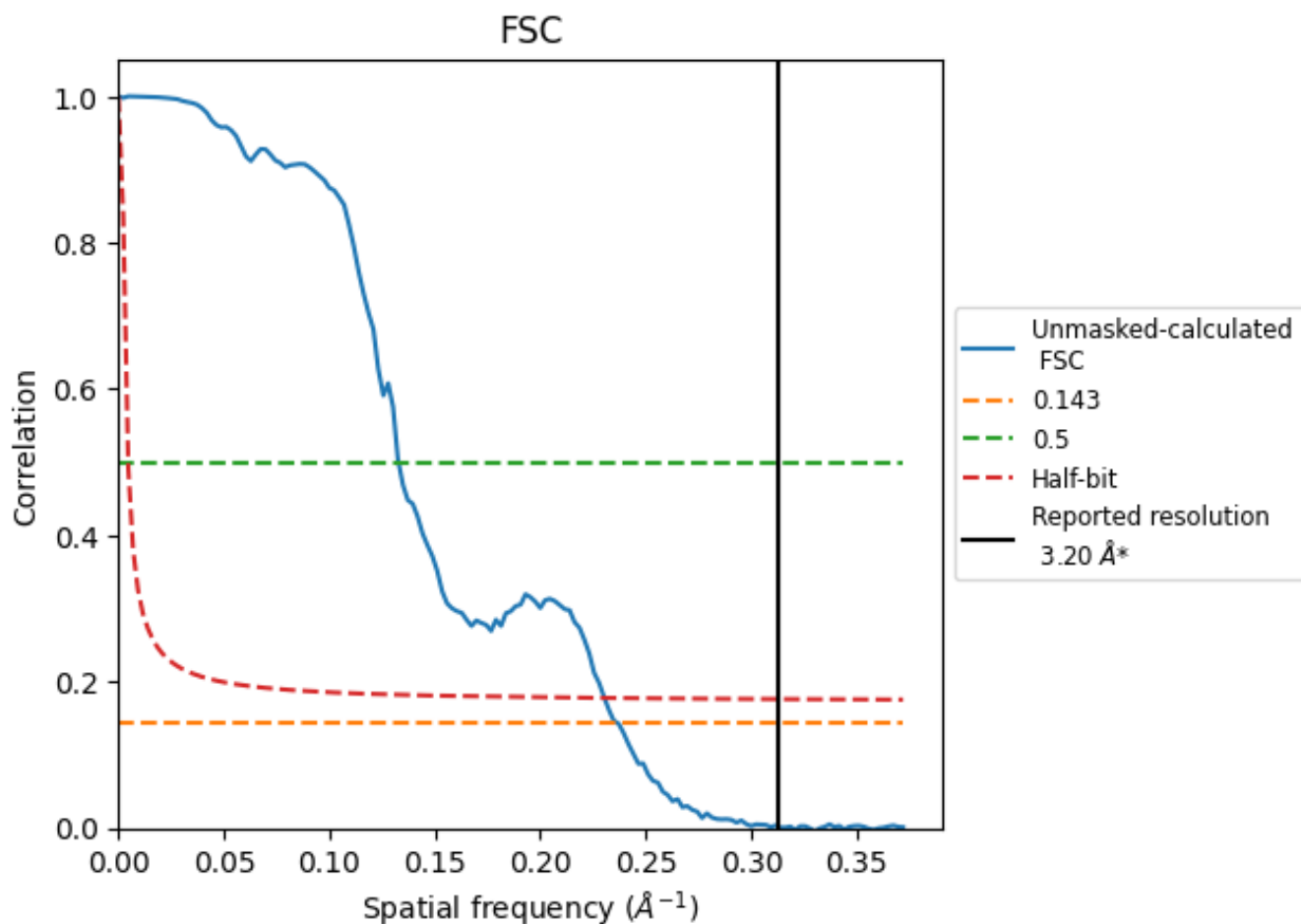


*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

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 0.312 Å⁻¹

8.2 Resolution estimates [i](#)

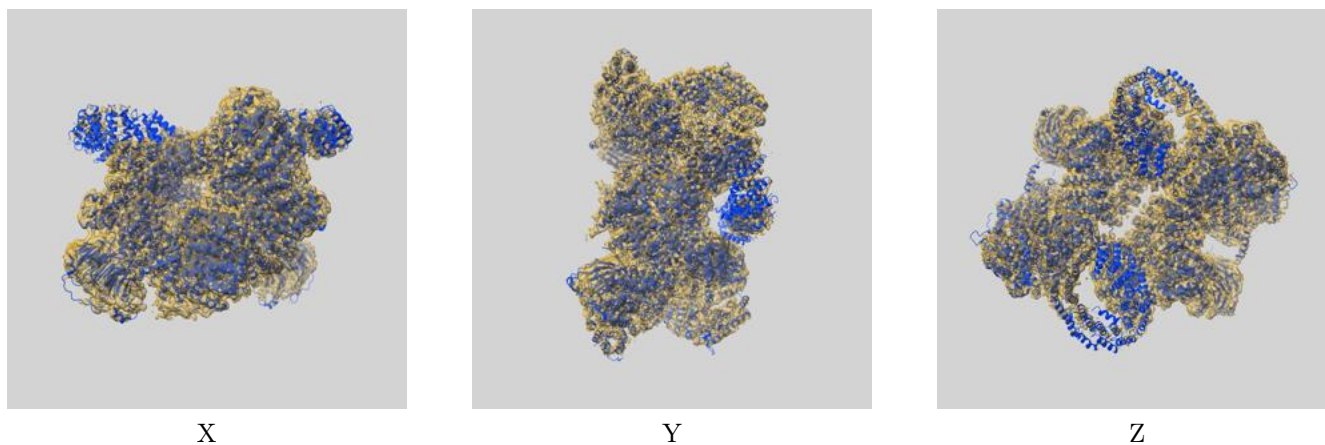
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.22	7.53	4.34

*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 4.22 differs from the reported value 3.2 by more than 10 %

9 Map-model fit [i](#)

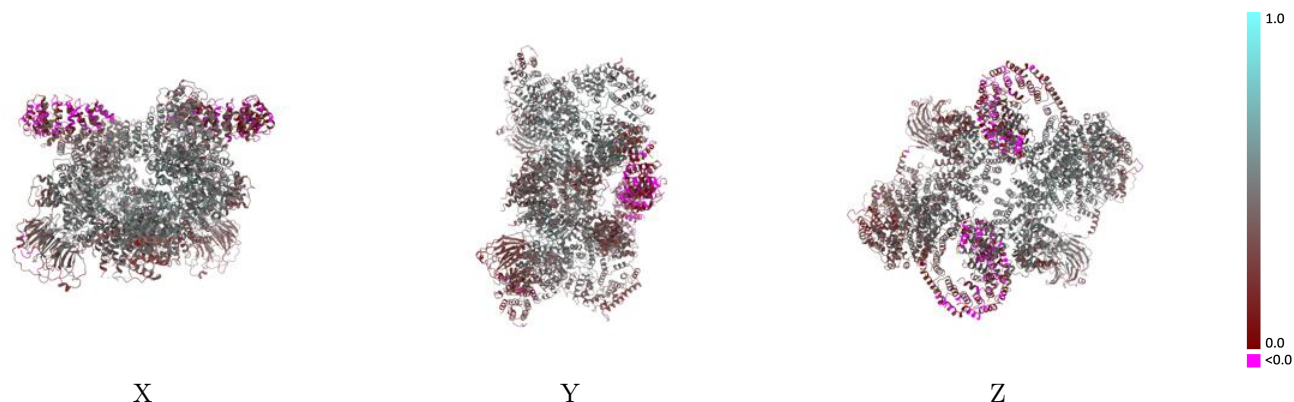
This section contains information regarding the fit between EMDB map EMD-11488 and PDB model 6ZWM. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



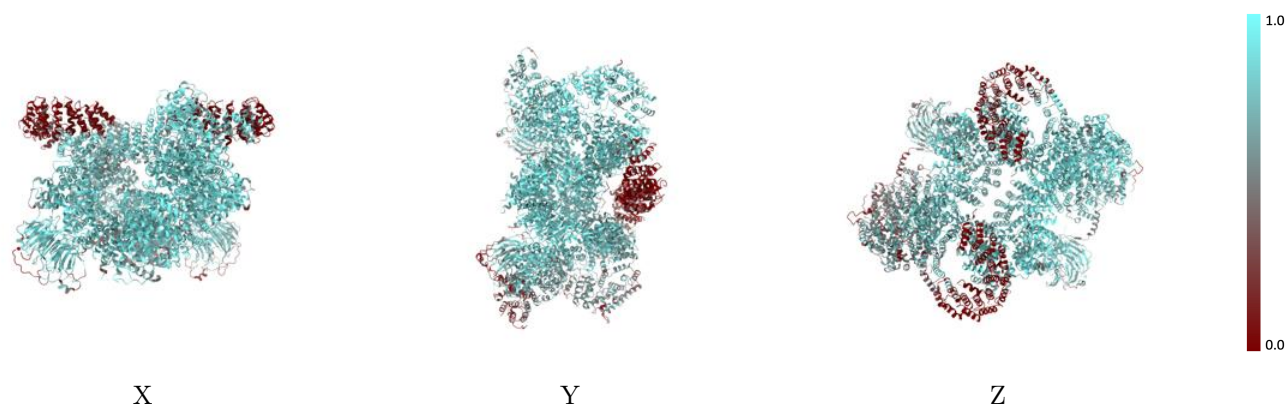
The images above show the 3D surface view of the map at the recommended contour level 0.375 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



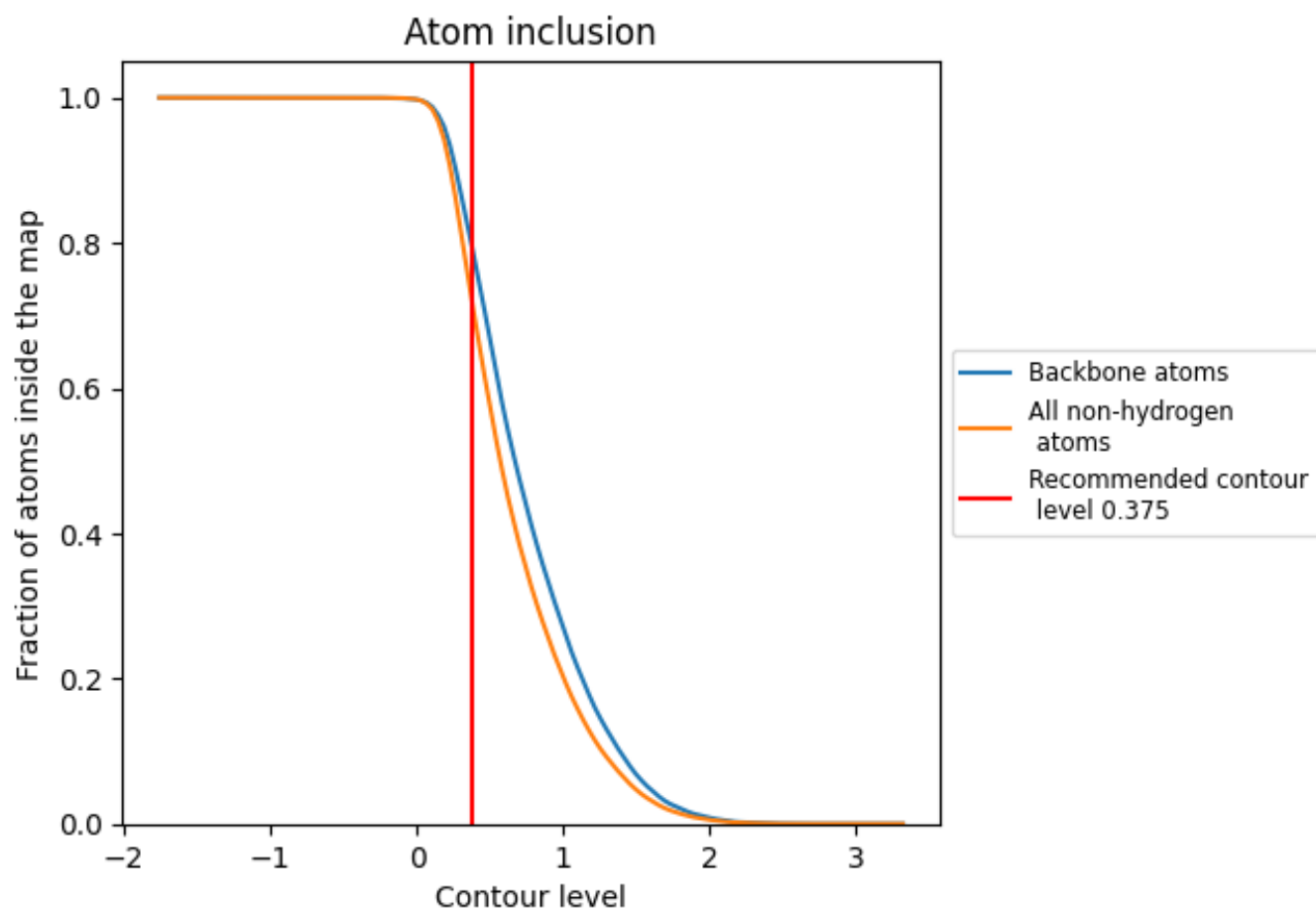
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.375).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 72% 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 (0.375) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7247	 0.3960
A	 0.7371	 0.3860
B	 0.7523	 0.4130
C	 0.6639	 0.3020
D	 0.7608	 0.3740
E	 0.5833	 0.3580
F	 0.8290	 0.4600
G	 0.4074	 0.3060
H	 0.6466	 0.3700

