



## Full wwPDB EM Validation Report ⓘ

Feb 4, 2025 – 06:16 PM EST

PDB ID : 9AZ6  
EMDB ID : EMD-44013  
Title : F-actin-Talin(R13-DD) complex  
Authors : Biertumpfel, C.; Yamada, Y.; Mizuno, N.  
Deposited on : 2024-03-10  
Resolution : 2.98 Å(reported)  
Based on initial models : 2jsw, 2qdq, 8a2t

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.40

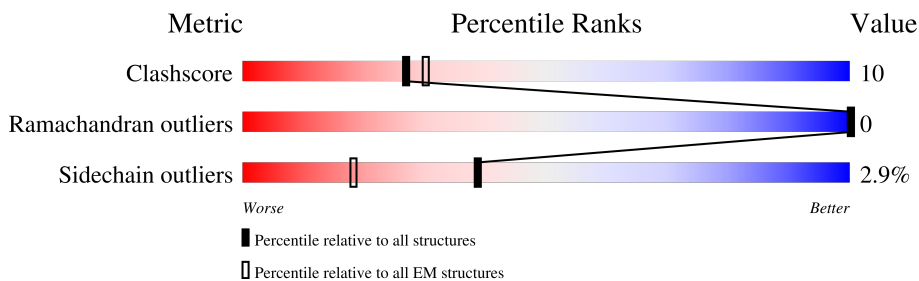
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.98 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.






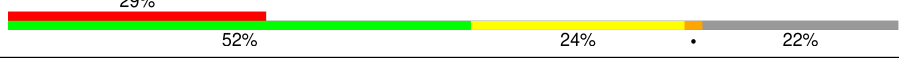

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 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	375	
1	B	375	
1	C	375	
1	D	375	
1	E	375	
2	F	246	
2	G	246	
2	H	246	

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Mol	Chain	Length	Quality of chain
2	I	246	
2	J	246	
2	K	246	
2	L	246	
2	M	246	

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 21831 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 Actin, alpha skeletal muscle.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	373	2916	1846	491	558	21	0	0
1	B	373	2916	1846	491	558	21	0	0
1	C	373	2916	1846	491	558	21	0	0
1	D	373	2916	1846	491	558	21	0	0
1	E	373	2916	1846	491	558	21	0	0

- Molecule 2 is a protein called Talin-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	F	192	1422	874	262	280	6	0	0
2	G	44	364	228	69	66	1	0	0
2	H	192	1422	874	262	280	6	0	0
2	I	42	353	221	67	64	1	0	0
2	J	192	1422	874	262	280	6	0	0
2	K	42	353	221	67	64	1	0	0
2	L	192	1422	874	262	280	6	0	0
2	M	42	353	221	67	64	1	0	0

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	2296	GLY	-	expression tag	UNP P26039
F	2297	PRO	-	expression tag	UNP P26039
F	2298	ASP	-	expression tag	UNP P26039
F	2299	SER	-	expression tag	UNP P26039
F	2300	MET	-	expression tag	UNP P26039
G	2296	GLY	-	expression tag	UNP P26039
G	2297	PRO	-	expression tag	UNP P26039
G	2298	ASP	-	expression tag	UNP P26039
G	2299	SER	-	expression tag	UNP P26039
G	2300	MET	-	expression tag	UNP P26039
H	2296	GLY	-	expression tag	UNP P26039
H	2297	PRO	-	expression tag	UNP P26039
H	2298	ASP	-	expression tag	UNP P26039
H	2299	SER	-	expression tag	UNP P26039
H	2300	MET	-	expression tag	UNP P26039
I	2296	GLY	-	expression tag	UNP P26039
I	2297	PRO	-	expression tag	UNP P26039
I	2298	ASP	-	expression tag	UNP P26039
I	2299	SER	-	expression tag	UNP P26039
I	2300	MET	-	expression tag	UNP P26039
J	2296	GLY	-	expression tag	UNP P26039
J	2297	PRO	-	expression tag	UNP P26039
J	2298	ASP	-	expression tag	UNP P26039
J	2299	SER	-	expression tag	UNP P26039
J	2300	MET	-	expression tag	UNP P26039
K	2296	GLY	-	expression tag	UNP P26039
K	2297	PRO	-	expression tag	UNP P26039
K	2298	ASP	-	expression tag	UNP P26039
K	2299	SER	-	expression tag	UNP P26039
K	2300	MET	-	expression tag	UNP P26039
L	2296	GLY	-	expression tag	UNP P26039
L	2297	PRO	-	expression tag	UNP P26039
L	2298	ASP	-	expression tag	UNP P26039
L	2299	SER	-	expression tag	UNP P26039
L	2300	MET	-	expression tag	UNP P26039
M	2296	GLY	-	expression tag	UNP P26039
M	2297	PRO	-	expression tag	UNP P26039
M	2298	ASP	-	expression tag	UNP P26039
M	2299	SER	-	expression tag	UNP P26039
M	2300	MET	-	expression tag	UNP P26039

- Molecule 3 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	
3	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	B	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	C	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	D	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	E	1	Total	C	N	O	P	0
			27	10	5	10	2	

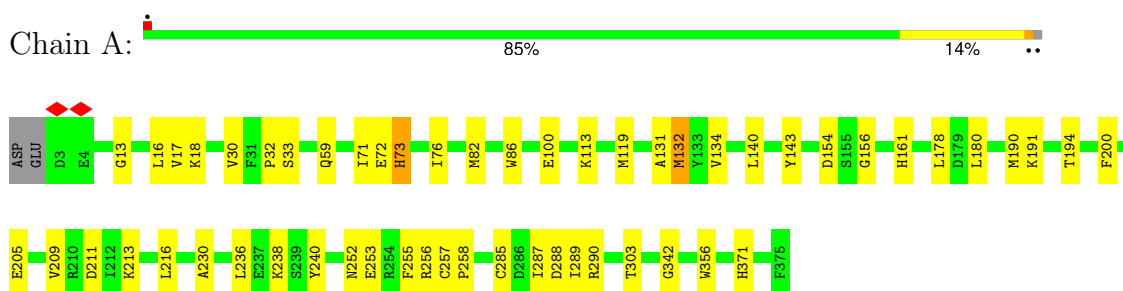
- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
4	A	1	Total	Mg	0
			1	1	
4	B	1	Total	Mg	0
			1	1	
4	C	1	Total	Mg	0
			1	1	
4	D	1	Total	Mg	0
			1	1	
4	E	1	Total	Mg	0
			1	1	

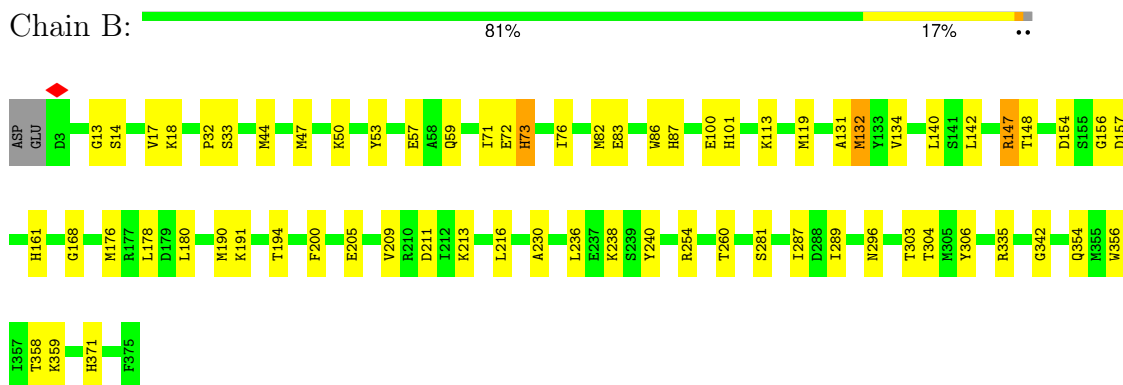
### 3 Residue-property plots

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.

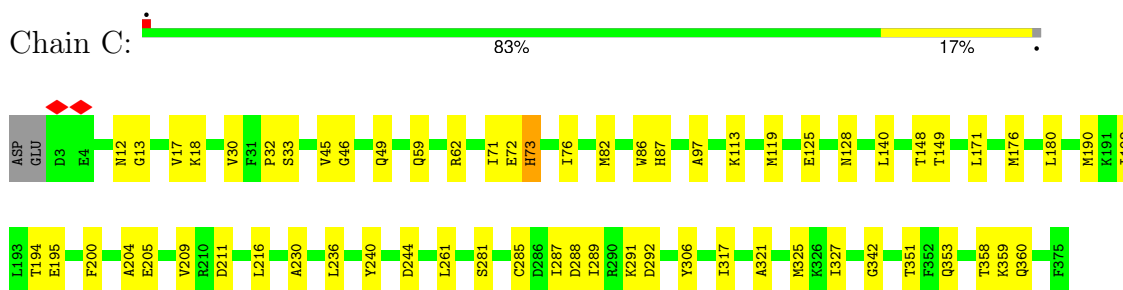
- Molecule 1: Actin, alpha skeletal muscle



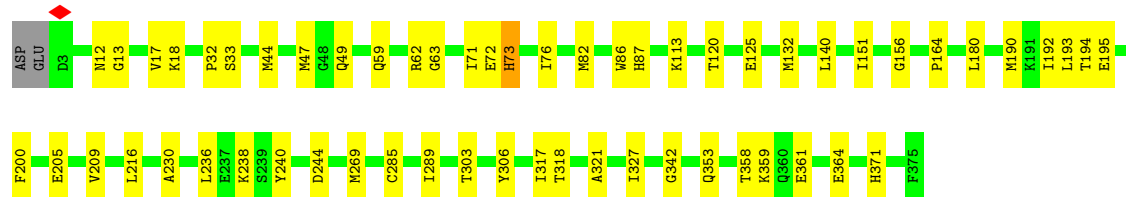
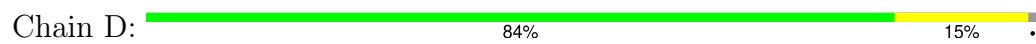
- Molecule 1: Actin, alpha skeletal muscle



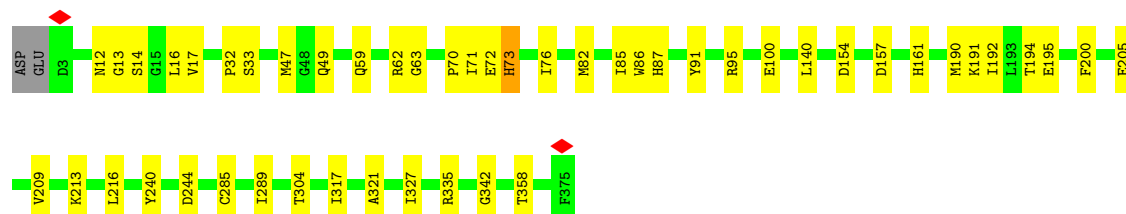
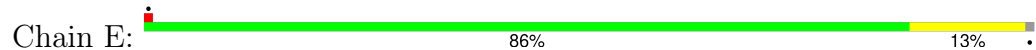
- Molecule 1: Actin, alpha skeletal muscle



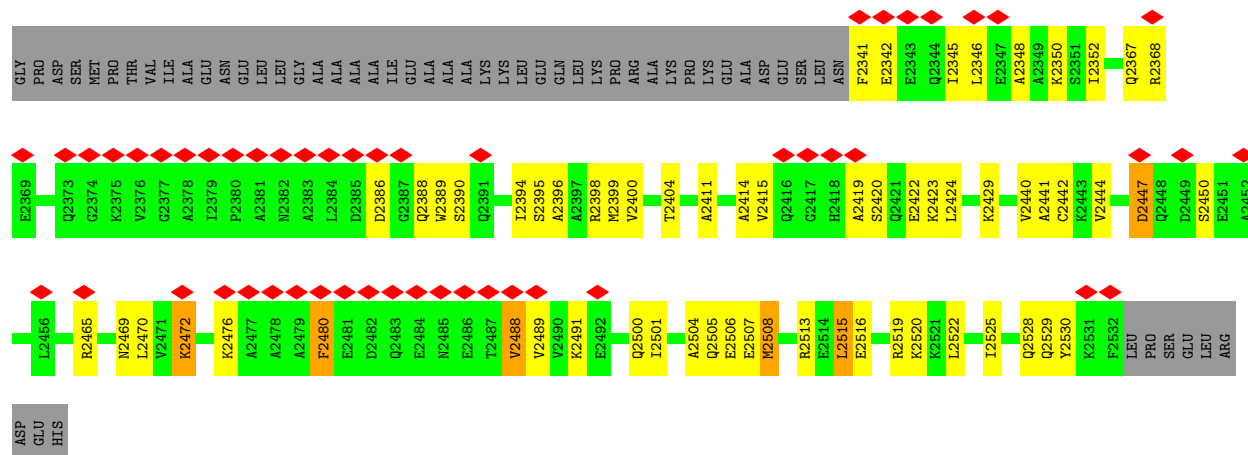
- Molecule 1: Actin, alpha skeletal muscle



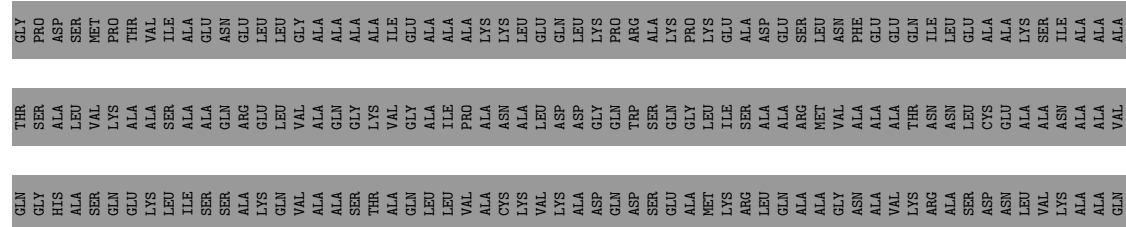
• Molecule 1: Actin, alpha skeletal muscle



• Molecule 2: Talin-1



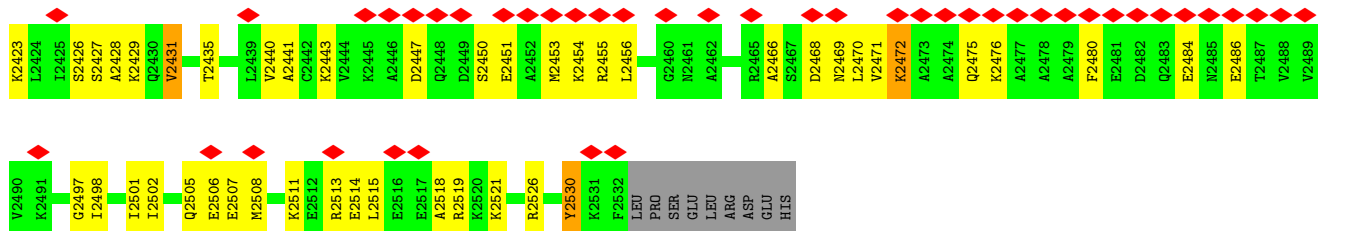
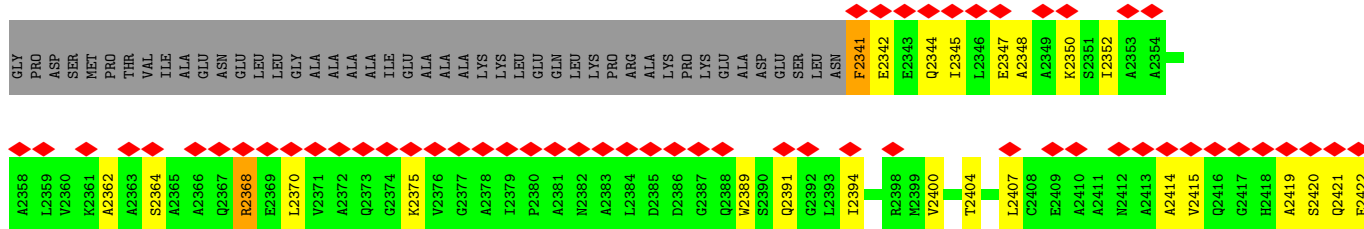
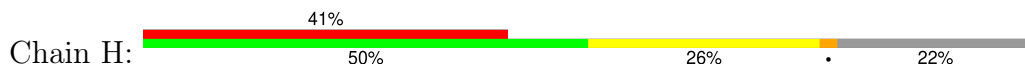
• Molecule 2: Talin-1



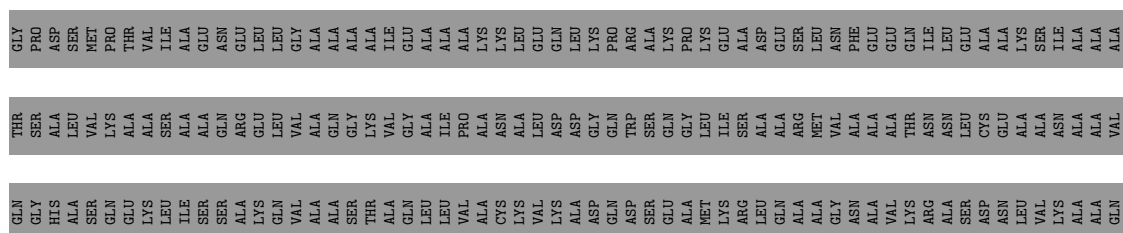




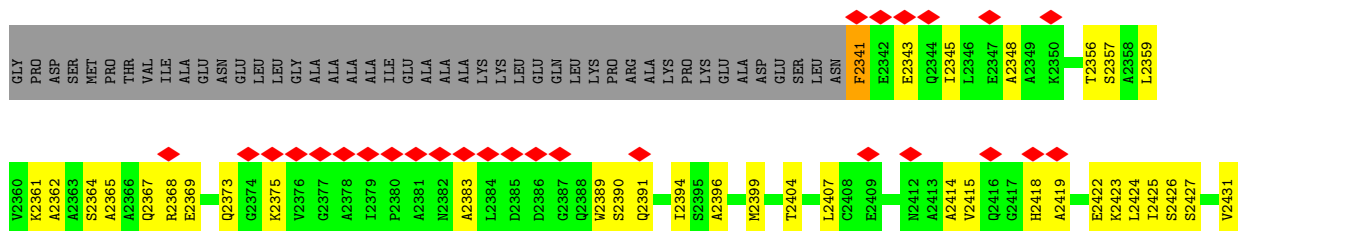
• Molecule 2: Talin-1



• Molecule 2: Talin-1



• Molecule 2: Talin-1





GLN  
GLY  
HIS  
ALA  
ALA  
PHE  
GLU  
GLN  
LYS  
LEU  
ILE  
SER  
SER  
THR  
VAL  
VAL  
VAL  
GLU  
LYS  
ALA  
SER  
THR  
VAL  
GLY

LYS  
ALA  
ALA  
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G2497  
I2498  
A2499  
Q2500  
I2501  
I2502  
A2503  
E2506  
L2509  
R2510  
K2511  
E2512  
R2513  
E2514  
L2515  
E2516  
E2517  
A2518  
R2519  
K2520  
K2521  
Q2524  
I2525  
Q2528  
Q2529  
Y2530  
K2531  
F2532  
R2538  
ASP  
GLU  
HIS

## 4 Experimental information

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=-166.66, -166.66°, rise=27.6, 27.6 Å, axial sym=C1, C1	Depositor
Number of segments used	206326	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 ( $e^-/\text{Å}^2$ )	52	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	0.052	Depositor
Minimum map value	-0.014	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.009	Depositor
Map size (Å)	265.6, 265.6, 265.6	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83000004, 0.83000004, 0.83000004	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: MG, HIC, ADP

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	0.29	0/2966	0.48	0/4017
1	B	0.30	0/2966	0.48	0/4017
1	C	0.30	0/2966	0.48	0/4017
1	D	0.30	0/2966	0.48	0/4017
1	E	0.29	0/2966	0.49	0/4017
2	F	0.26	0/1429	0.52	0/1919
2	G	0.34	0/366	0.73	0/485
2	H	0.26	0/1429	0.52	0/1919
2	I	0.33	0/355	0.69	0/470
2	J	0.27	0/1429	0.53	0/1919
2	K	0.33	0/355	0.70	0/470
2	L	0.25	0/1429	0.53	0/1919
2	M	0.33	0/355	0.69	0/470
All	All	0.29	0/21977	0.51	0/29656

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	2916	0	2882	36	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	2916	0	2882	47	0
1	C	2916	0	2882	54	0
1	D	2916	0	2882	50	0
1	E	2916	0	2882	34	0
2	F	1422	0	1461	47	0
2	G	364	0	384	22	0
2	H	1422	0	1461	57	0
2	I	353	0	372	22	0
2	J	1422	0	1461	57	0
2	K	353	0	372	22	0
2	L	1422	0	1461	50	0
2	M	353	0	372	27	0
3	A	27	0	12	2	0
3	B	27	0	12	3	0
3	C	27	0	12	3	0
3	D	27	0	12	3	0
3	E	27	0	12	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
All	All	21831	0	21814	424	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 10.

All (424) 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)
2:L:2356:THR:HG21	2:L:2404:THR:HG21	1.55	0.86
2:J:2356:THR:HG21	2:J:2404:THR:HG21	1.58	0.86
2:F:2505:GLN:O	2:F:2508:MET:HB2	1.76	0.85
2:F:2367:GLN:HG3	2:F:2394:ILE:HG23	1.63	0.80
2:F:2420:SER:OG	2:G:2510:ARG:NH2	2.14	0.79
1:D:49:GLN:O	2:J:2513:ARG:NH2	2.15	0.78
1:A:18:LYS:NZ	3:A:401:ADP:O2B	2.22	0.72
2:J:2391:GLN:HB2	2:J:2394:ILE:HD11	1.72	0.72
2:G:2526:ARG:HD3	2:G:2529:GLN:HG2	1.72	0.71
1:B:304:THR:O	1:B:335:ARG:NH1	2.24	0.71
2:H:2345:ILE:HG12	2:H:2415:VAL:HG11	1.71	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:2422:GLU:HB3	2:G:2509:LEU:HB3	1.72	0.70
1:C:18:LYS:NZ	3:C:401:ADP:O2B	2.24	0.70
2:F:2348:ALA:HB3	2:F:2470:LEU:HD23	1.74	0.70
2:J:2345:ILE:HG12	2:J:2415:VAL:HG11	1.74	0.69
2:F:2516:GLU:HG2	2:F:2520:LYS:HE3	1.76	0.68
2:H:2515:LEU:HA	2:I:2511:LYS:HD3	1.76	0.68
2:L:2420:SER:OG	2:M:2510:ARG:NH1	2.27	0.68
2:M:2506:GLU:OE2	2:M:2510:ARG:NH2	2.27	0.68
1:B:18:LYS:NZ	3:B:401:ADP:O2B	2.27	0.67
2:J:2399:MET:HE1	2:J:2434:SER:HB2	1.76	0.67
1:D:87:HIS:CE1	2:J:2519:ARG:HG3	2.31	0.66
2:L:2508:MET:HE1	2:M:2519:ARG:HA	1.75	0.66
2:F:2515:LEU:HA	2:G:2511:LYS:HE2	1.78	0.65
1:A:287:ILE:HG13	1:C:244:ASP:HB3	1.78	0.65
1:C:288:ASP:OD2	1:E:62:ARG:NH2	2.26	0.64
1:D:17:VAL:HG23	1:D:33:SER:HB3	1.80	0.64
1:A:253:GLU:HA	1:A:256:ARG:HB2	1.78	0.64
2:I:2502:ILE:O	2:I:2506:GLU:HG2	1.98	0.64
2:J:2530:TYR:HD2	2:J:2532:PHE:H	1.43	0.64
2:J:2348:ALA:HB3	2:J:2470:LEU:HD23	1.80	0.63
2:L:2394:ILE:HD12	2:L:2395:SER:N	2.14	0.63
2:J:2367:GLN:HG3	2:J:2394:ILE:HG23	1.79	0.63
1:B:113:LYS:HG3	1:C:195:GLU:HG3	1.79	0.63
2:G:2514:GLU:HA	2:G:2517:GLU:HG2	1.80	0.62
1:C:12:ASN:OD1	1:C:86:TRP:NE1	2.25	0.62
1:D:358:THR:HG22	2:J:2440:VAL:HG12	1.81	0.62
1:C:17:VAL:HG23	1:C:33:SER:HB3	1.82	0.62
2:J:2492:GLU:HA	2:K:2531:LYS:HZ1	1.63	0.62
1:B:354:GLN:HA	2:F:2444:VAL:HA	1.82	0.62
1:C:359:LYS:HG3	2:H:2389:TRP:CH2	2.35	0.62
1:D:113:LYS:HD3	1:E:195:GLU:HG2	1.80	0.62
2:F:2345:ILE:HG12	2:F:2415:VAL:HG11	1.80	0.62
2:F:2422:GLU:HB2	2:G:2510:ARG:CZ	2.30	0.61
2:M:2500:GLN:CD	2:M:2500:GLN:H	2.04	0.61
1:B:168:GLY:HA2	1:D:44:MET:HG3	1.83	0.60
1:D:359:LYS:HG3	2:J:2389:TRP:HH2	1.67	0.60
2:F:2508:MET:HG3	2:G:2522:LEU:HD12	1.82	0.60
2:L:2345:ILE:HG12	2:L:2415:VAL:HG11	1.82	0.60
2:L:2390:SER:O	2:L:2395:SER:OG	2.13	0.60
1:E:304:THR:O	1:E:335:ARG:NH1	2.35	0.60
2:F:2489:VAL:O	2:G:2528:GLN:NE2	2.35	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:17:VAL:HG23	1:A:33:SER:HB3	1.83	0.60
2:H:2400:VAL:O	2:H:2404:THR:HG23	2.02	0.60
2:G:2506:GLU:OE1	2:G:2510:ARG:NH1	2.35	0.59
2:H:2421:GLN:NE2	2:H:2480:PHE:O	2.34	0.59
1:E:17:VAL:HG23	1:E:33:SER:HB3	1.84	0.59
2:L:2488:VAL:HG13	2:M:2528:GLN:HE22	1.66	0.59
2:L:2422:GLU:HB3	2:M:2509:LEU:HB3	1.85	0.59
2:J:2425:ILE:HD12	2:J:2426:SER:N	2.18	0.59
1:D:317:ILE:HG22	1:D:327:ILE:HD13	1.85	0.59
2:F:2501:ILE:HD11	2:G:2532:PHE:HE1	1.68	0.59
2:J:2364:SER:O	2:J:2368:ARG:HG2	2.01	0.59
2:H:2348:ALA:HB3	2:H:2470:LEU:HD13	1.85	0.58
2:J:2383:ALA:O	2:J:2390:SER:OG	2.18	0.58
1:B:71:ILE:HG12	1:B:76:ILE:HG12	1.85	0.58
1:E:358:THR:HG21	2:L:2441:ALA:HA	1.84	0.58
1:D:12:ASN:OD1	1:D:86:TRP:NE1	2.34	0.58
2:J:2443:LYS:HA	2:J:2453:MET:SD	2.43	0.58
2:J:2508:MET:HE2	2:J:2508:MET:HA	1.84	0.58
1:C:358:THR:HG21	2:H:2441:ALA:HA	1.86	0.58
1:A:156:GLY:O	1:A:303:THR:OG1	2.21	0.57
2:J:2373:GLN:O	2:J:2375:LYS:NZ	2.38	0.57
1:B:17:VAL:HG23	1:B:33:SER:HB3	1.85	0.57
2:G:2502:ILE:O	2:G:2506:GLU:HG2	2.04	0.57
2:H:2420:SER:OG	2:I:2510:ARG:NH1	2.36	0.57
1:C:180:LEU:HD21	1:C:261:LEU:HA	1.87	0.57
1:B:87:HIS:CD2	2:F:2519:ARG:HG3	2.40	0.57
1:B:156:GLY:O	1:B:303:THR:OG1	2.22	0.57
1:B:358:THR:HG21	2:F:2441:ALA:HA	1.87	0.57
1:D:230:ALA:HB2	1:D:236:LEU:HD12	1.86	0.57
2:J:2359:LEU:HD22	2:J:2459:ALA:HB1	1.87	0.57
2:F:2447:ASP:HB3	2:F:2450:SER:HB2	1.87	0.56
2:F:2348:ALA:O	2:F:2352:ILE:HG12	2.05	0.56
1:B:190:MET:HG2	1:B:209:VAL:HG21	1.86	0.56
2:H:2526:ARG:HD3	2:I:2501:ILE:HD12	1.86	0.56
1:E:317:ILE:HG22	1:E:327:ILE:HD13	1.85	0.56
2:J:2525:ILE:HG23	2:K:2501:ILE:HD13	1.87	0.56
1:C:317:ILE:HG22	1:C:327:ILE:HD13	1.87	0.56
2:H:2505:GLN:O	2:H:2508:MET:HB2	2.06	0.56
2:F:2423:LYS:HB2	2:G:2510:ARG:HH22	1.71	0.56
2:K:2502:ILE:O	2:K:2506:GLU:HG2	2.06	0.56
1:B:147:ARG:NH1	1:B:296:ASN:OD1	2.38	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:2411:ALA:HB2	2:F:2470:LEU:HD11	1.88	0.55
2:J:2515:LEU:HD23	2:K:2511:LYS:HZ2	1.72	0.55
2:F:2390:SER:O	2:F:2395:SER:OG	2.16	0.55
2:L:2371:VAL:HG11	2:L:2378:ALA:HB2	1.88	0.55
2:L:2525:ILE:HG23	2:M:2501:ILE:HD13	1.88	0.55
2:H:2370:LEU:HD22	2:H:2375:LYS:HG3	1.89	0.55
1:C:71:ILE:HG12	1:C:76:ILE:HG12	1.87	0.55
2:J:2341:PHE:N	2:J:2343:GLU:OE1	2.40	0.55
1:A:71:ILE:HG12	1:A:76:ILE:HG12	1.88	0.55
1:C:359:LYS:HG3	2:H:2389:TRP:HH2	1.70	0.54
2:J:2507:GLU:HG3	2:J:2510:ARG:HH21	1.72	0.54
2:L:2345:ILE:O	2:L:2349:ALA:N	2.40	0.54
2:F:2414:ALA:HB2	2:F:2424:LEU:HD21	1.89	0.54
2:F:2515:LEU:HD23	2:G:2511:LYS:HE2	1.89	0.54
2:H:2466:ALA:HA	2:H:2469:ASN:ND2	2.23	0.54
2:J:2492:GLU:HA	2:K:2531:LYS:NZ	2.21	0.54
2:I:2524:GLN:O	2:I:2528:GLN:NE2	2.40	0.54
2:M:2519:ARG:HH11	2:M:2519:ARG:HG2	1.72	0.54
1:B:100:GLU:HG3	1:B:101:HIS:CD2	2.42	0.54
1:C:351:THR:OG1	2:L:2506:GLU:HG2	2.07	0.54
1:A:190:MET:HG2	1:A:209:VAL:HG21	1.87	0.54
2:L:2422:GLU:HA	2:L:2425:ILE:HG13	1.87	0.54
1:A:86:TRP:HH2	1:A:119:MET:HG2	1.72	0.54
2:F:2525:ILE:HD12	2:F:2528:GLN:HB2	1.90	0.54
2:G:2531:LYS:HD2	2:G:2532:PHE:HD2	1.72	0.53
2:I:2500:GLN:OE1	2:I:2500:GLN:N	2.34	0.53
2:F:2522:LEU:O	2:F:2525:ILE:HG22	2.09	0.53
2:J:2362:ALA:HB1	2:J:2456:LEU:HD22	1.89	0.53
1:E:12:ASN:HD22	1:E:86:TRP:HE1	1.56	0.53
1:D:358:THR:HG21	2:J:2441:ALA:HA	1.91	0.53
1:B:359:LYS:HG3	2:F:2389:TRP:CH2	2.44	0.53
2:H:2447:ASP:HB3	2:H:2450:SER:HB2	1.90	0.53
1:C:76:ILE:HD13	1:C:82:MET:HG2	1.91	0.53
1:A:285:CYS:HB3	1:A:289:ILE:HD11	1.90	0.53
2:K:2511:LYS:HA	2:K:2514:GLU:HG2	1.91	0.53
2:F:2386:ASP:OD2	2:F:2398:ARG:NH1	2.41	0.52
1:C:353:GLN:HB3	2:H:2443:LYS:HD2	1.92	0.52
2:F:2394:ILE:HD12	2:F:2395:SER:N	2.24	0.52
2:F:2388:GLN:HG3	2:F:2389:TRP:CD2	2.45	0.52
2:H:2344:GLN:O	2:H:2347:GLU:HG3	2.09	0.52
1:B:76:ILE:HD13	1:B:82:MET:HG2	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:2407:LEU:HD23	2:L:2427:SER:HB2	1.90	0.52
2:H:2426:SER:HB3	2:I:2509:LEU:HD12	1.91	0.52
2:K:2511:LYS:HD3	2:K:2511:LYS:C	2.30	0.52
2:L:2411:ALA:HB2	2:L:2470:LEU:HD11	1.91	0.52
1:D:359:LYS:HG3	2:J:2389:TRP:CH2	2.44	0.52
2:F:2400:VAL:O	2:F:2404:THR:HG23	2.10	0.52
1:D:125:GLU:HG2	2:J:2530:TYR:CE2	2.44	0.51
1:B:200:PHE:HB3	1:B:205:GLU:HB3	1.92	0.51
1:E:71:ILE:HG12	1:E:76:ILE:HG12	1.91	0.51
2:L:2425:ILE:HD12	2:L:2426:SER:N	2.24	0.51
2:M:2514:GLU:HA	2:M:2517:GLU:HG2	1.93	0.51
1:D:216:LEU:HD22	1:D:238:LYS:HD3	1.92	0.51
1:D:180:LEU:HB2	1:D:269:MET:HE1	1.92	0.51
1:D:76:ILE:HD13	1:D:82:MET:HG2	1.92	0.51
2:L:2394:ILE:HD12	2:L:2395:SER:H	1.75	0.51
1:C:358:THR:HG22	2:H:2440:VAL:HG12	1.92	0.51
2:L:2348:ALA:HB3	2:L:2470:LEU:HD23	1.92	0.51
2:L:2492:GLU:OE1	2:M:2531:LYS:NZ	2.44	0.51
1:C:200:PHE:HB3	1:C:205:GLU:HB3	1.93	0.50
2:H:2362:ALA:HA	2:H:2455:ARG:HH21	1.76	0.50
2:H:2526:ARG:HE	2:I:2501:ILE:HG23	1.75	0.50
1:D:49:GLN:HG2	2:J:2513:ARG:NH2	2.26	0.50
1:C:360:GLN:HG3	2:H:2389:TRP:CG	2.46	0.50
2:G:2511:LYS:HZ2	2:G:2511:LYS:C	2.15	0.50
1:D:200:PHE:HB3	1:D:205:GLU:HB3	1.93	0.50
1:B:50:LYS:HD3	1:B:53:TYR:CE2	2.46	0.50
1:B:176:MET:HG3	1:B:281:SER:HB2	1.93	0.50
2:L:2422:GLU:HB2	2:M:2510:ARG:NH1	2.26	0.50
1:A:76:ILE:HD13	1:A:82:MET:HG2	1.94	0.50
1:E:358:THR:HG22	2:L:2440:VAL:HG12	1.93	0.50
2:F:2525:ILE:O	2:F:2529:GLN:N	2.42	0.50
2:H:2497:GLY:O	2:H:2501:ILE:HG23	2.12	0.50
2:H:2515:LEU:CA	2:I:2511:LYS:HD3	2.41	0.50
2:K:2533:LEU:HD12	2:K:2537:LEU:HB3	1.92	0.50
2:J:2515:LEU:N	2:K:2511:LYS:HE3	2.26	0.49
1:B:359:LYS:HG3	2:F:2389:TRP:HH2	1.78	0.49
2:M:2502:ILE:O	2:M:2506:GLU:HG2	2.11	0.49
1:B:132:MET:HE1	1:B:134:VAL:HG23	1.95	0.49
1:C:86:TRP:HH2	1:C:119:MET:HG2	1.78	0.49
2:F:2469:ASN:O	2:F:2472:LYS:HG3	2.12	0.49
2:H:2466:ALA:HA	2:H:2469:ASN:HD21	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:2365:ALA:O	2:J:2369:GLU:HG2	2.13	0.49
1:A:100:GLU:N	1:A:100:GLU:OE1	2.45	0.49
2:K:2512:GLU:OE1	2:K:2512:GLU:HA	2.11	0.49
1:B:287:ILE:HG13	1:D:244:ASP:HB3	1.94	0.49
2:J:2407:LEU:HD23	2:J:2427:SER:HB2	1.94	0.49
2:J:2419:ALA:HB1	2:J:2423:LYS:HD3	1.95	0.49
1:A:200:PHE:HB3	1:A:205:GLU:HB3	1.94	0.49
1:E:72:GLU:OE2	1:E:73:HIC:HD2	2.11	0.49
2:J:2469:ASN:O	2:J:2472:LYS:HG3	2.13	0.49
2:J:2512:GLU:O	2:J:2515:LEU:HB3	2.13	0.49
2:L:2422:GLU:HB2	2:M:2510:ARG:CZ	2.42	0.49
1:C:87:HIS:CE1	2:H:2519:ARG:HG3	2.48	0.48
1:D:353:GLN:HB3	2:J:2443:LYS:HD3	1.95	0.48
2:H:2422:GLU:HB2	2:I:2510:ARG:NH2	2.28	0.48
1:C:12:ASN:HD22	1:C:17:VAL:HG22	1.78	0.48
1:D:71:ILE:HG12	1:D:76:ILE:HG12	1.95	0.48
1:D:72:GLU:OE2	1:D:73:HIC:HD2	2.13	0.48
1:E:190:MET:HG3	1:E:209:VAL:HG11	1.95	0.48
2:H:2422:GLU:HB3	2:I:2509:LEU:HB3	1.95	0.48
2:L:2341:PHE:HD1	2:L:2477:ALA:HB1	1.79	0.48
1:C:211:ASP:OD2	1:C:240:TYR:OH	2.21	0.48
1:E:14:SER:HB2	1:E:157:ASP:HB3	1.95	0.48
2:J:2491:LYS:O	2:K:2531:LYS:NZ	2.41	0.48
2:L:2367:GLN:NE2	2:L:2391:GLN:O	2.46	0.48
2:M:2529:GLN:NE2	2:M:2538:ARG:O	2.47	0.48
1:C:190:MET:HG2	1:C:209:VAL:HG21	1.95	0.48
1:D:49:GLN:HG2	2:J:2513:ARG:HH22	1.78	0.48
2:J:2515:LEU:HD23	2:K:2511:LYS:NZ	2.28	0.48
2:L:2443:LYS:HA	2:L:2453:MET:SD	2.54	0.48
1:A:113:LYS:HB3	1:A:371:HIS:CE1	2.49	0.48
2:G:2521:LYS:O	2:G:2524:GLN:HG3	2.14	0.48
2:F:2419:ALA:HB1	2:F:2423:LYS:HD3	1.96	0.47
2:I:2521:LYS:O	2:I:2525:ILE:HG12	2.14	0.47
1:B:72:GLU:OE2	1:B:73:HIC:HD2	2.14	0.47
1:D:192:ILE:O	1:D:195:GLU:HB3	2.14	0.47
2:G:2534:PRO:HD2	2:G:2537:LEU:HD12	1.95	0.47
2:H:2514:GLU:HB2	2:I:2511:LYS:HZ1	1.80	0.47
2:I:2514:GLU:HA	2:I:2517:GLU:OE1	2.13	0.47
2:I:2521:LYS:O	2:I:2524:GLN:HG3	2.14	0.47
2:M:2521:LYS:O	2:M:2524:GLN:HG3	2.14	0.47
1:C:230:ALA:HB2	1:C:236:LEU:HD12	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:113:LYS:HE2	1:D:371:HIS:CE1	2.49	0.47
1:B:13:GLY:HA3	3:B:401:ADP:PB	2.54	0.47
1:C:97:ALA:HB1	2:H:2429:LYS:HE3	1.97	0.47
1:B:358:THR:HG22	2:F:2440:VAL:HG12	1.96	0.47
1:D:125:GLU:HG2	2:J:2530:TYR:HE2	1.80	0.47
1:D:18:LYS:NZ	3:D:401:ADP:O2B	2.48	0.47
1:E:100:GLU:OE1	1:E:100:GLU:N	2.47	0.47
2:M:2511:LYS:HA	2:M:2514:GLU:OE1	2.14	0.47
1:A:13:GLY:HA3	3:A:401:ADP:PB	2.55	0.47
1:C:216:LEU:HD11	1:C:240:TYR:HB2	1.97	0.47
2:L:2380:PRO:HA	2:L:2391:GLN:HG2	1.96	0.47
2:L:2423:LYS:N	2:M:2510:ARG:HH12	2.13	0.47
2:L:2508:MET:HE3	2:M:2519:ARG:HD3	1.97	0.47
1:E:13:GLY:HA3	3:E:401:ADP:PB	2.54	0.47
2:H:2428:ALA:HB2	2:H:2471:VAL:HG21	1.97	0.47
1:A:72:GLU:OE2	1:A:73:HIC:HD2	2.15	0.47
2:F:2342:GLU:O	2:F:2345:ILE:HG13	2.15	0.47
2:H:2352:ILE:HD12	2:H:2466:ALA:HB1	1.96	0.47
1:E:200:PHE:HB3	1:E:205:GLU:HB3	1.96	0.47
2:F:2420:SER:HA	2:F:2480:PHE:CZ	2.50	0.47
2:J:2431:VAL:O	2:J:2435:THR:HG22	2.15	0.47
2:L:2519:ARG:HH11	2:L:2520:LYS:NZ	2.13	0.47
1:C:285:CYS:HB3	1:C:289:ILE:HD11	1.97	0.46
2:L:2421:GLN:O	2:L:2424:LEU:HG	2.15	0.46
1:A:211:ASP:OD2	1:A:240:TYR:OH	2.23	0.46
1:D:285:CYS:HB3	1:D:289:ILE:HD11	1.97	0.46
2:F:2396:ALA:O	2:F:2399:MET:HG2	2.15	0.46
2:H:2501:ILE:HG13	2:H:2502:ILE:N	2.30	0.46
2:L:2423:LYS:HA	2:M:2506:GLU:OE2	2.15	0.46
2:J:2487:THR:HG23	2:J:2488:VAL:H	1.79	0.46
2:J:2530:TYR:O	2:J:2531:LYS:HG2	2.15	0.46
1:A:216:LEU:HD11	1:A:240:TYR:HB2	1.98	0.46
1:C:125:GLU:HG2	2:H:2530:TYR:CE1	2.51	0.46
1:E:140:LEU:O	1:E:342:GLY:HA3	2.15	0.46
2:J:2507:GLU:O	2:J:2511:LYS:HG2	2.15	0.46
1:A:140:LEU:O	1:A:342:GLY:HA3	2.16	0.46
1:C:190:MET:HG3	1:C:209:VAL:HG11	1.98	0.46
1:D:321:ALA:HB3	1:D:327:ILE:HD11	1.97	0.46
1:E:32:PRO:HG2	1:E:59:GLN:HE21	1.81	0.46
2:M:2506:GLU:O	2:M:2510:ARG:NE	2.33	0.46
2:J:2422:GLU:HB3	2:K:2509:LEU:HB3	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:76:ILE:HD13	1:E:82:MET:HG2	1.97	0.46
1:E:191:LYS:O	1:E:194:THR:OG1	2.27	0.46
1:A:213:LYS:HE2	1:A:213:LYS:HB3	1.79	0.46
2:K:2510:ARG:HG3	2:K:2511:LYS:N	2.31	0.46
1:A:190:MET:O	1:A:194:THR:HG23	2.17	0.45
1:B:180:LEU:HD11	1:B:260:THR:HG22	1.97	0.45
2:I:2521:LYS:HE3	2:I:2521:LYS:HB2	1.84	0.45
1:A:131:ALA:HB1	1:A:356:TRP:HB3	1.97	0.45
1:D:87:HIS:HE1	2:J:2519:ARG:HG3	1.81	0.45
1:A:290:ARG:HD2	1:C:244:ASP:HB2	1.98	0.45
2:J:2414:ALA:HB2	2:J:2424:LEU:HD21	1.99	0.45
1:E:49:GLN:O	2:L:2513:ARG:NH2	2.50	0.45
2:F:2504:ALA:O	2:F:2507:GLU:HB3	2.15	0.45
2:K:2513:ARG:O	2:K:2517:GLU:HG3	2.16	0.45
2:L:2492:GLU:HA	2:M:2531:LYS:NZ	2.31	0.45
1:B:50:LYS:HA	2:F:2513:ARG:HH12	1.81	0.45
2:H:2364:SER:HB3	2:H:2368:ARG:NH2	2.31	0.45
2:H:2419:ALA:HB1	2:H:2423:LYS:HD3	1.99	0.45
2:L:2388:GLN:HG3	2:L:2389:TRP:CD2	2.52	0.45
1:B:191:LYS:O	1:B:194:THR:OG1	2.29	0.45
1:B:230:ALA:HB2	1:B:236:LEU:HD12	1.99	0.45
2:L:2371:VAL:CG1	2:L:2378:ALA:HB2	2.47	0.45
2:H:2423:LYS:HA	2:I:2506:GLU:OE1	2.16	0.45
2:H:2514:GLU:HB2	2:I:2511:LYS:NZ	2.32	0.45
1:C:140:LEU:O	1:C:342:GLY:HA3	2.17	0.44
2:L:2431:VAL:O	2:L:2435:THR:HG22	2.18	0.44
1:E:285:CYS:HB3	1:E:289:ILE:HD11	1.99	0.44
1:B:238:LYS:HB2	1:B:254:ARG:HD3	1.98	0.44
1:A:16:LEU:HD23	1:A:32:PRO:HA	2.00	0.44
1:C:190:MET:O	1:C:194:THR:HG23	2.18	0.44
1:E:87:HIS:HD1	1:E:91:TYR:HD2	1.65	0.44
2:H:2407:LEU:HD22	2:H:2427:SER:HB3	2.00	0.44
2:L:2469:ASN:O	2:L:2472:LYS:HG3	2.18	0.44
2:L:2522:LEU:HD11	2:L:2526:ARG:HE	1.82	0.44
1:B:53:TYR:HD2	1:B:57:GLU:HG2	1.82	0.43
1:B:113:LYS:HE3	1:B:371:HIS:CE1	2.52	0.43
1:B:216:LEU:HD22	1:B:238:LYS:HG2	2.00	0.43
1:C:49:GLN:O	2:H:2513:ARG:HD2	2.18	0.43
2:H:2414:ALA:HB1	2:H:2480:PHE:HZ	1.82	0.43
2:H:2456:LEU:HD23	2:H:2456:LEU:HA	1.71	0.43
2:L:2508:MET:CE	2:M:2519:ARG:HD3	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:149:THR:HG21	1:C:292:ASP:HB3	2.00	0.43
1:E:70:PRO:HG3	1:E:85:ILE:HD12	2.00	0.43
1:E:216:LEU:HD11	1:E:240:TYR:HB2	2.00	0.43
2:G:2534:PRO:O	2:G:2538:ARG:N	2.51	0.43
2:H:2342:GLU:O	2:H:2345:ILE:HG13	2.18	0.43
1:A:230:ALA:HB2	1:A:236:LEU:HD12	1.99	0.43
1:C:113:LYS:HG3	1:D:195:GLU:HG3	2.01	0.43
1:D:12:ASN:HD22	1:D:17:VAL:HG22	1.83	0.43
1:D:120:THR:HA	1:D:132:MET:SD	2.59	0.43
1:B:142:LEU:HD12	1:B:142:LEU:HA	1.91	0.43
2:M:2521:LYS:O	2:M:2525:ILE:HG12	2.18	0.43
1:C:287:ILE:HG13	1:E:244:ASP:HB3	2.01	0.43
1:A:154:ASP:HB3	1:A:161:HIS:CE1	2.53	0.43
1:C:359:LYS:HB2	1:C:359:LYS:HE2	1.63	0.43
2:H:2484:GLU:HB3	2:H:2486:GLU:HG2	2.01	0.43
2:L:2525:ILE:HD12	2:L:2525:ILE:HA	1.82	0.43
1:D:361:GLU:HA	1:D:364:GLU:HG2	2.01	0.43
1:C:289:ILE:HG23	1:E:63:GLY:HA3	2.00	0.43
1:C:321:ALA:HB3	1:C:327:ILE:HD11	2.00	0.43
1:E:16:LEU:HD23	1:E:32:PRO:HA	2.01	0.43
1:B:14:SER:HB2	1:B:157:ASP:HB3	2.01	0.42
1:C:291:LYS:HA	1:C:325:MET:HE3	2.01	0.42
2:F:2488:VAL:HG22	2:G:2528:GLN:HE22	1.84	0.42
1:A:143:TYR:OH	1:C:45:VAL:HG12	2.18	0.42
1:C:18:LYS:HG3	1:C:30:VAL:HG22	2.01	0.42
2:H:2472:LYS:HA	2:H:2475:GLN:HE21	1.85	0.42
1:B:140:LEU:O	1:B:342:GLY:HA3	2.19	0.42
2:H:2391:GLN:O	2:H:2394:ILE:HG12	2.19	0.42
2:H:2507:GLU:O	2:H:2511:LYS:HG2	2.19	0.42
2:I:2534:PRO:HG2	2:I:2537:LEU:HD13	2.02	0.42
2:L:2516:GLU:OE2	2:L:2520:LYS:HE2	2.19	0.42
1:C:13:GLY:HA3	3:C:401:ADP:PB	2.60	0.42
1:C:192:ILE:O	1:C:195:GLU:HB3	2.19	0.42
1:D:190:MET:HG3	1:D:209:VAL:HG11	2.01	0.42
2:J:2505:GLN:O	2:J:2508:MET:HB3	2.19	0.42
2:K:2524:GLN:HA	2:K:2527:GLN:OE1	2.19	0.42
2:L:2346:LEU:HD23	2:L:2346:LEU:HA	1.88	0.42
1:D:190:MET:HG2	1:D:209:VAL:HG21	2.00	0.42
1:E:154:ASP:HB3	1:E:161:HIS:CE1	2.55	0.42
2:H:2350:LYS:HA	2:H:2350:LYS:HD3	1.79	0.42
2:H:2431:VAL:O	2:H:2435:THR:HG22	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:2506:GLU:HA	2:M:2510:ARG:HH21	1.84	0.42
1:A:252:ASN:HA	1:A:255:PHE:CE1	2.55	0.42
1:C:148:THR:HG21	1:E:47:MET:HG2	2.01	0.42
2:G:2520:LYS:HD2	2:G:2520:LYS:O	2.19	0.42
2:J:2357:SER:O	2:J:2361:LYS:HG2	2.20	0.42
2:J:2484:GLU:HG3	2:J:2486:GLU:H	1.85	0.42
2:L:2488:VAL:HG13	2:M:2528:GLN:NE2	2.34	0.42
1:C:306:TYR:CE1	3:C:401:ADP:H2	2.38	0.42
2:F:2429:LYS:HB2	2:F:2429:LYS:HE2	1.79	0.42
2:J:2396:ALA:HB3	2:J:2438:LEU:HD13	2.01	0.42
1:A:288:ASP:OD1	1:C:62:ARG:NH2	2.33	0.42
1:C:46:GLY:HA2	2:H:2506:GLU:HB2	2.00	0.42
1:D:216:LEU:HD11	1:D:240:TYR:HB2	2.01	0.42
2:J:2522:LEU:HD23	2:K:2504:ALA:HB3	2.00	0.42
1:B:213:LYS:HE2	1:B:213:LYS:HB3	1.81	0.42
1:E:192:ILE:O	1:E:195:GLU:HB2	2.20	0.42
2:H:2454:LYS:HB2	2:H:2454:LYS:HE3	1.85	0.42
1:A:18:LYS:HG3	1:A:30:VAL:HG22	2.01	0.41
1:B:86:TRP:HH2	1:B:119:MET:HG2	1.85	0.41
1:C:171:LEU:HD12	1:C:285:CYS:SG	2.60	0.41
1:D:13:GLY:HA3	3:D:401:ADP:PB	2.60	0.41
2:K:2500:GLN:OE1	2:K:2500:GLN:N	2.41	0.41
1:B:148:THR:HG21	1:D:47:MET:HG3	2.01	0.41
2:I:2526:ARG:O	2:I:2526:ARG:NH1	2.53	0.41
2:J:2425:ILE:HD11	2:K:2509:LEU:HG	2.02	0.41
2:L:2357:SER:O	2:L:2361:LYS:HG2	2.20	0.41
2:L:2519:ARG:HH11	2:L:2520:LYS:HZ2	1.67	0.41
1:B:190:MET:O	1:B:194:THR:HG23	2.21	0.41
1:B:306:TYR:CE1	3:B:401:ADP:H2	2.39	0.41
1:E:190:MET:O	1:E:194:THR:HG23	2.20	0.41
2:G:2511:LYS:HE3	2:G:2511:LYS:HB3	1.72	0.41
2:F:2423:LYS:H	2:G:2510:ARG:HH22	1.68	0.41
1:A:191:LYS:O	1:A:194:THR:OG1	2.28	0.41
2:H:2451:GLU:HA	2:H:2454:LYS:HE3	2.02	0.41
1:A:178:LEU:HG	1:A:180:LEU:H	1.86	0.41
1:C:32:PRO:HG2	1:C:59:GLN:HE21	1.85	0.41
1:D:62:ARG:H	1:D:62:ARG:HG3	1.61	0.41
1:E:321:ALA:HB3	1:E:327:ILE:HD11	2.01	0.41
2:M:2529:GLN:HA	2:M:2532:PHE:CE1	2.55	0.41
1:B:131:ALA:HB1	1:B:356:TRP:HB3	2.03	0.41
1:C:176:MET:HG3	1:C:281:SER:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:2501:ILE:HG22	2:I:2525:ILE:HG22	2.02	0.41
2:J:2514:GLU:HA	2:J:2517:GLU:HG3	2.03	0.41
1:A:132:MET:HE1	1:A:134:VAL:HG23	2.02	0.41
1:A:216:LEU:HD22	1:A:238:LYS:HD3	2.03	0.41
1:A:257:CYS:HB3	1:A:258:PRO:HD3	2.03	0.41
1:A:288:ASP:OD2	1:C:204:ALA:HB1	2.21	0.41
1:C:128:ASN:ND2	2:H:2526:ARG:HD2	2.35	0.41
1:D:140:LEU:O	1:D:342:GLY:HA3	2.20	0.41
1:D:306:TYR:CE2	3:D:401:ADP:H2	2.39	0.41
2:F:2346:LEU:O	2:F:2350:LYS:HG2	2.21	0.41
2:J:2498:ILE:O	2:J:2502:ILE:HG12	2.21	0.41
2:K:2510:ARG:O	2:K:2514:GLU:HG2	2.21	0.41
2:L:2429:LYS:HE2	2:L:2429:LYS:HB2	1.79	0.41
2:L:2513:ARG:O	2:L:2517:GLU:HG2	2.21	0.41
1:B:83:GLU:HG2	2:F:2519:ARG:HH12	1.85	0.41
1:B:211:ASP:OD2	1:B:240:TYR:OH	2.23	0.41
1:D:190:MET:O	1:D:194:THR:HG23	2.21	0.41
2:H:2486:GLU:OE1	2:I:2520:LYS:HE3	2.20	0.41
2:H:2518:ALA:HA	2:H:2521:LYS:HD2	2.03	0.41
2:L:2517:GLU:O	2:L:2521:LYS:HG3	2.21	0.41
1:D:151:ILE:HA	1:D:164:PRO:HA	2.02	0.40
2:H:2341:PHE:O	2:H:2344:GLN:HG3	2.21	0.40
2:H:2498:ILE:HA	2:H:2501:ILE:HG12	2.02	0.40
1:B:32:PRO:HG2	1:B:59:GLN:HE21	1.86	0.40
1:D:193:LEU:HD23	1:D:193:LEU:HA	1.93	0.40
2:F:2525:ILE:HD12	2:F:2525:ILE:HA	1.83	0.40
2:J:2375:LYS:HD3	2:J:2375:LYS:HA	1.84	0.40
2:K:2521:LYS:HE3	2:K:2521:LYS:HB2	1.84	0.40
1:A:32:PRO:HG2	1:A:59:GLN:HE21	1.86	0.40
1:B:289:ILE:HG23	1:D:63:GLY:HA3	2.03	0.40
1:D:318:THR:HA	1:D:327:ILE:HD12	2.04	0.40
1:B:178:LEU:HG	1:B:180:LEU:H	1.87	0.40
1:C:72:GLU:OE2	1:C:73:HIC:HD2	2.21	0.40
1:D:18:LYS:HB2	1:D:18:LYS:HE2	1.87	0.40
1:E:95:ARG:CZ	1:E:95:ARG:HB2	2.51	0.40
2:F:2491:LYS:HB2	2:F:2500:GLN:NE2	2.36	0.40
2:M:2503:ALA:O	2:M:2506:GLU:HB2	2.21	0.40
1:B:154:ASP:HB3	1:B:161:HIS:CE1	2.57	0.40
1:D:32:PRO:HG2	1:D:59:GLN:HE21	1.87	0.40
1:D:156:GLY:O	1:D:303:THR:OG1	2.39	0.40
1:E:213:LYS:HE2	1:E:213:LYS:HB3	1.81	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:2346:LEU:HD23	2:F:2346:LEU:HA	1.89	0.40
2:J:2526:ARG:HD3	2:K:2501:ILE:HD12	2.04	0.40
2:L:2527:GLN:HB3	2:L:2531:LYS:HE3	2.03	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	370/375 (99%)	367 (99%)	3 (1%)	0	100	100
1	B	370/375 (99%)	366 (99%)	4 (1%)	0	100	100
1	C	370/375 (99%)	368 (100%)	2 (0%)	0	100	100
1	D	370/375 (99%)	369 (100%)	1 (0%)	0	100	100
1	E	370/375 (99%)	369 (100%)	1 (0%)	0	100	100
2	F	190/246 (77%)	186 (98%)	4 (2%)	0	100	100
2	G	42/246 (17%)	41 (98%)	1 (2%)	0	100	100
2	H	190/246 (77%)	188 (99%)	2 (1%)	0	100	100
2	I	40/246 (16%)	40 (100%)	0	0	100	100
2	J	190/246 (77%)	186 (98%)	4 (2%)	0	100	100
2	K	40/246 (16%)	40 (100%)	0	0	100	100
2	L	190/246 (77%)	187 (98%)	3 (2%)	0	100	100
2	M	40/246 (16%)	40 (100%)	0	0	100	100
All	All	2772/3843 (72%)	2747 (99%)	25 (1%)	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	315/317 (99%)	314 (100%)	1 (0%)	91	96
1	B	315/317 (99%)	311 (99%)	4 (1%)	65	84
1	C	315/317 (99%)	315 (100%)	0	100	100
1	D	315/317 (99%)	315 (100%)	0	100	100
1	E	315/317 (99%)	315 (100%)	0	100	100
2	F	139/181 (77%)	126 (91%)	13 (9%)	7	26
2	G	37/181 (20%)	33 (89%)	4 (11%)	5	20
2	H	139/181 (77%)	131 (94%)	8 (6%)	17	46
2	I	36/181 (20%)	31 (86%)	5 (14%)	3	12
2	J	139/181 (77%)	129 (93%)	10 (7%)	12	38
2	K	36/181 (20%)	30 (83%)	6 (17%)	2	8
2	L	139/181 (77%)	128 (92%)	11 (8%)	10	33
2	M	36/181 (20%)	31 (86%)	5 (14%)	3	12
All	All	2276/3033 (75%)	2209 (97%)	67 (3%)	39	68

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	132	MET
1	B	44	MET
1	B	47	MET
1	B	132	MET
1	B	147	ARG
2	F	2341	PHE
2	F	2368	ARG
2	F	2442	CYS
2	F	2447	ASP
2	F	2465	ARG
2	F	2472	LYS
2	F	2476	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	F	2480	PHE
2	F	2488	VAL
2	F	2506	GLU
2	F	2508	MET
2	F	2515	LEU
2	F	2530	TYR
2	G	2508	MET
2	G	2514	GLU
2	G	2520	LYS
2	G	2527	GLN
2	H	2341	PHE
2	H	2368	ARG
2	H	2431	VAL
2	H	2453	MET
2	H	2468	ASP
2	H	2472	LYS
2	H	2476	LYS
2	H	2530	TYR
2	I	2507	GLU
2	I	2520	LYS
2	I	2521	LYS
2	I	2529	GLN
2	I	2530	TYR
2	J	2341	PHE
2	J	2418	HIS
2	J	2442	CYS
2	J	2447	ASP
2	J	2472	LYS
2	J	2476	LYS
2	J	2483	GLN
2	J	2490	VAL
2	J	2501	ILE
2	J	2530	TYR
2	K	2510	ARG
2	K	2517	GLU
2	K	2524	GLN
2	K	2529	GLN
2	K	2532	PHE
2	K	2533	LEU
2	L	2368	ARG
2	L	2399	MET
2	L	2418	HIS

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Mol	Chain	Res	Type
2	L	2453	MET
2	L	2456	LEU
2	L	2472	LYS
2	L	2476	LYS
2	L	2480	PHE
2	L	2508	MET
2	L	2510	ARG
2	L	2520	LYS
2	M	2510	ARG
2	M	2513	ARG
2	M	2529	GLN
2	M	2531	LYS
2	M	2538	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	12	ASN
1	C	161	HIS
1	D	12	ASN
1	D	161	HIS
1	D	371	HIS
1	E	12	ASN
2	F	2475	GLN
2	F	2505	GLN
2	G	2528	GLN
2	H	2391	GLN
2	H	2485	ASN
2	H	2529	GLN
2	I	2505	GLN
2	I	2527	GLN
2	J	2500	GLN
2	K	2528	GLN
2	L	2469	ASN
2	M	2528	GLN
2	M	2529	GLN

### 5.3.3 RNA

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains

5 non-standard protein/DNA/RNA residues 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
1	HIC	B	73	1	8,11,12	1.12	1 (12%)	5,14,16	0.81	0
1	HIC	A	73	1	8,11,12	1.13	1 (12%)	5,14,16	0.81	0
1	HIC	C	73	1	8,11,12	1.10	1 (12%)	5,14,16	0.82	0
1	HIC	E	73	1	8,11,12	1.12	1 (12%)	5,14,16	0.80	0
1	HIC	D	73	1	8,11,12	1.13	1 (12%)	5,14,16	0.86	0

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
1	HIC	B	73	1	-	0/5/6/8	0/1/1/1
1	HIC	A	73	1	-	0/5/6/8	0/1/1/1
1	HIC	C	73	1	-	0/5/6/8	0/1/1/1
1	HIC	E	73	1	-	0/5/6/8	0/1/1/1
1	HIC	D	73	1	-	0/5/6/8	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	73	HIC	CE1-ND1	-2.39	1.31	1.34
1	B	73	HIC	CE1-ND1	-2.38	1.31	1.34
1	E	73	HIC	CE1-ND1	-2.36	1.31	1.34
1	A	73	HIC	CE1-ND1	-2.35	1.31	1.34
1	C	73	HIC	CE1-ND1	-2.30	1.31	1.34

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	73	HIC	1	0
1	A	73	HIC	1	0
1	C	73	HIC	1	0
1	E	73	HIC	1	0
1	D	73	HIC	1	0

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 5 are monoatomic - leaving 5 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
3	ADP	B	401	4	24,29,29	0.85	0	29,45,45	1.26	2 (6%)
3	ADP	E	401	4	24,29,29	0.85	0	29,45,45	1.24	2 (6%)
3	ADP	C	401	4	24,29,29	0.84	0	29,45,45	1.25	2 (6%)
3	ADP	A	401	4	24,29,29	0.86	0	29,45,45	1.25	2 (6%)
3	ADP	D	401	4	24,29,29	0.85	0	29,45,45	1.23	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
3	ADP	B	401	4	-	7/12/32/32	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	E	401	4	-	5/12/32/32	0/3/3/3
3	ADP	C	401	4	-	6/12/32/32	0/3/3/3
3	ADP	A	401	4	-	6/12/32/32	0/3/3/3
3	ADP	D	401	4	-	3/12/32/32	0/3/3/3

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	401	ADP	N3-C2-N1	-3.58	123.81	128.67
3	B	401	ADP	N3-C2-N1	-3.57	123.83	128.67
3	E	401	ADP	N3-C2-N1	-3.54	123.87	128.67
3	C	401	ADP	N3-C2-N1	-3.53	123.88	128.67
3	D	401	ADP	N3-C2-N1	-3.41	124.05	128.67
3	C	401	ADP	C4-C5-N7	-2.51	106.68	109.34
3	E	401	ADP	C4-C5-N7	-2.51	106.69	109.34
3	D	401	ADP	C4-C5-N7	-2.50	106.69	109.34
3	B	401	ADP	C4-C5-N7	-2.50	106.69	109.34
3	A	401	ADP	C4-C5-N7	-2.48	106.72	109.34

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	401	ADP	PA-O3A-PB-O2B
3	A	401	ADP	C5'-O5'-PA-O1A
3	A	401	ADP	C5'-O5'-PA-O2A
3	A	401	ADP	C5'-O5'-PA-O3A
3	B	401	ADP	PA-O3A-PB-O2B
3	B	401	ADP	C5'-O5'-PA-O1A
3	B	401	ADP	C5'-O5'-PA-O2A
3	B	401	ADP	C5'-O5'-PA-O3A
3	C	401	ADP	PA-O3A-PB-O2B
3	C	401	ADP	C5'-O5'-PA-O1A
3	C	401	ADP	C5'-O5'-PA-O2A
3	C	401	ADP	C5'-O5'-PA-O3A
3	D	401	ADP	C5'-O5'-PA-O2A
3	D	401	ADP	C5'-O5'-PA-O3A
3	E	401	ADP	C5'-O5'-PA-O1A
3	E	401	ADP	C5'-O5'-PA-O2A

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
3	E	401	ADP	C5'-O5'-PA-O3A
3	A	401	ADP	PA-O3A-PB-O3B
3	C	401	ADP	PA-O3A-PB-O3B
3	E	401	ADP	PA-O3A-PB-O2B
3	D	401	ADP	C5'-O5'-PA-O1A
3	B	401	ADP	PB-O3A-PA-O1A
3	A	401	ADP	PA-O3A-PB-O1B
3	B	401	ADP	PA-O3A-PB-O1B
3	C	401	ADP	PA-O3A-PB-O1B
3	B	401	ADP	PA-O3A-PB-O3B
3	E	401	ADP	PA-O3A-PB-O3B

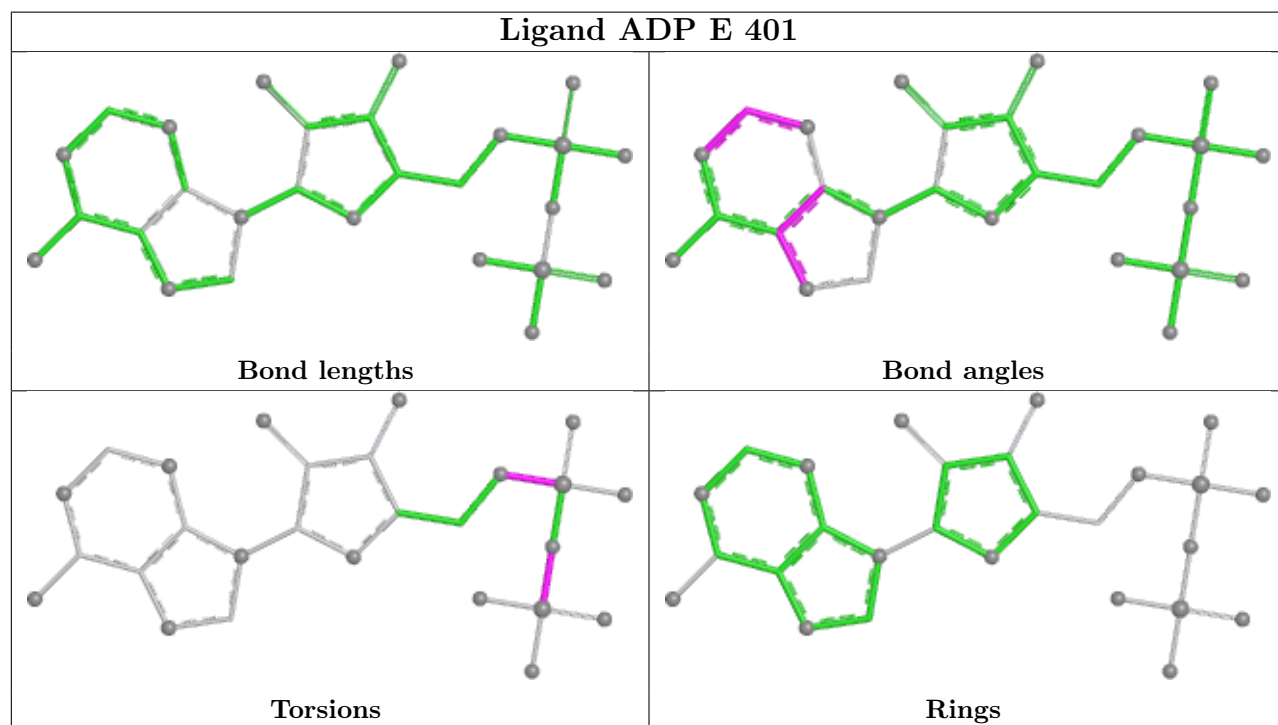
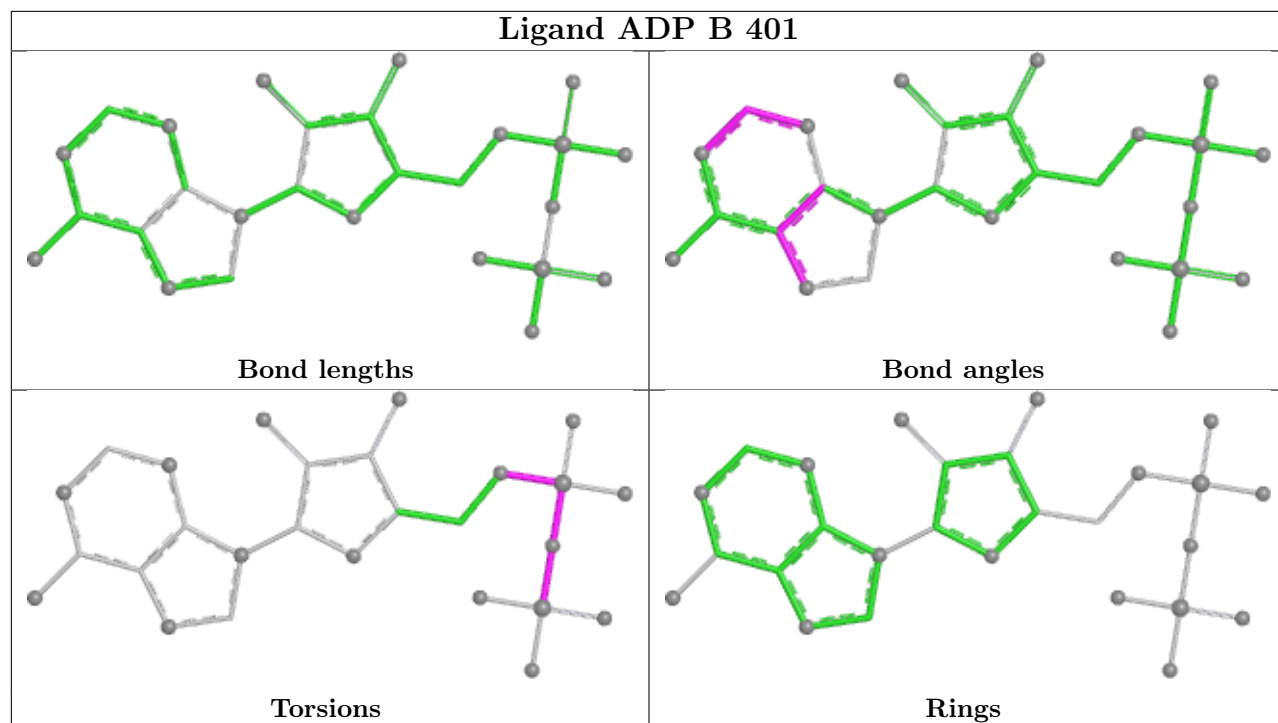
There are no ring outliers.

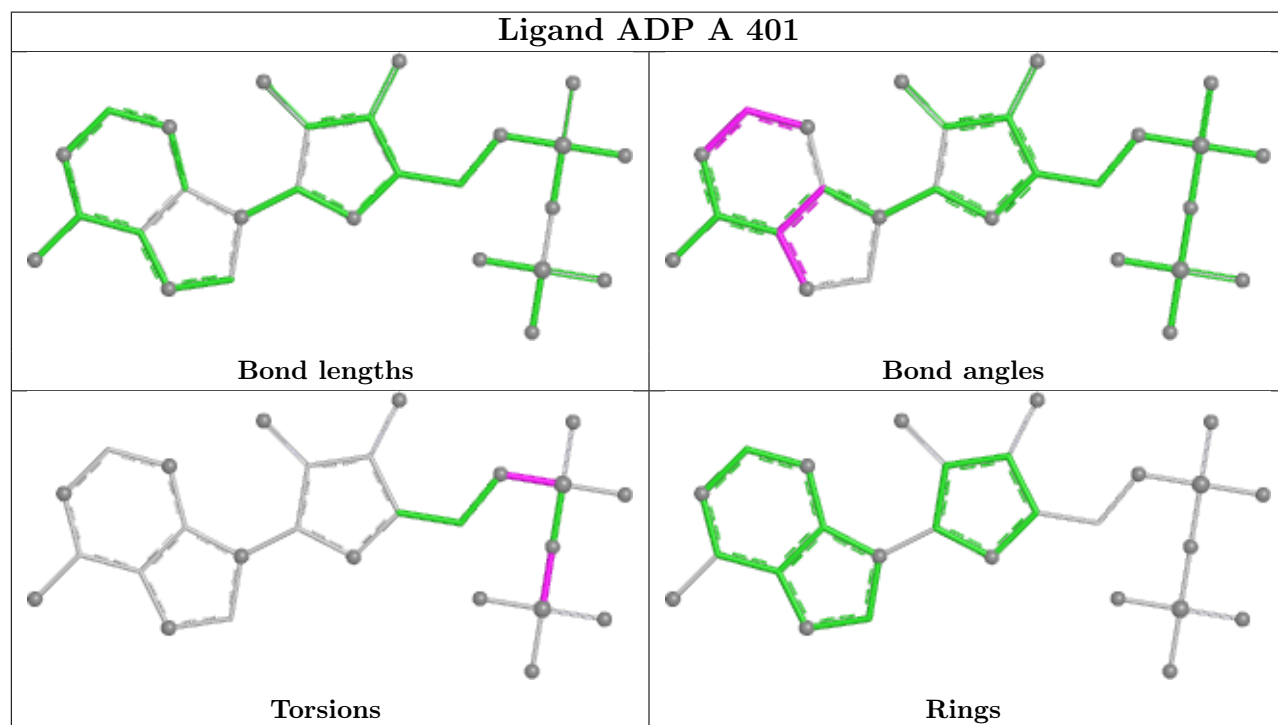
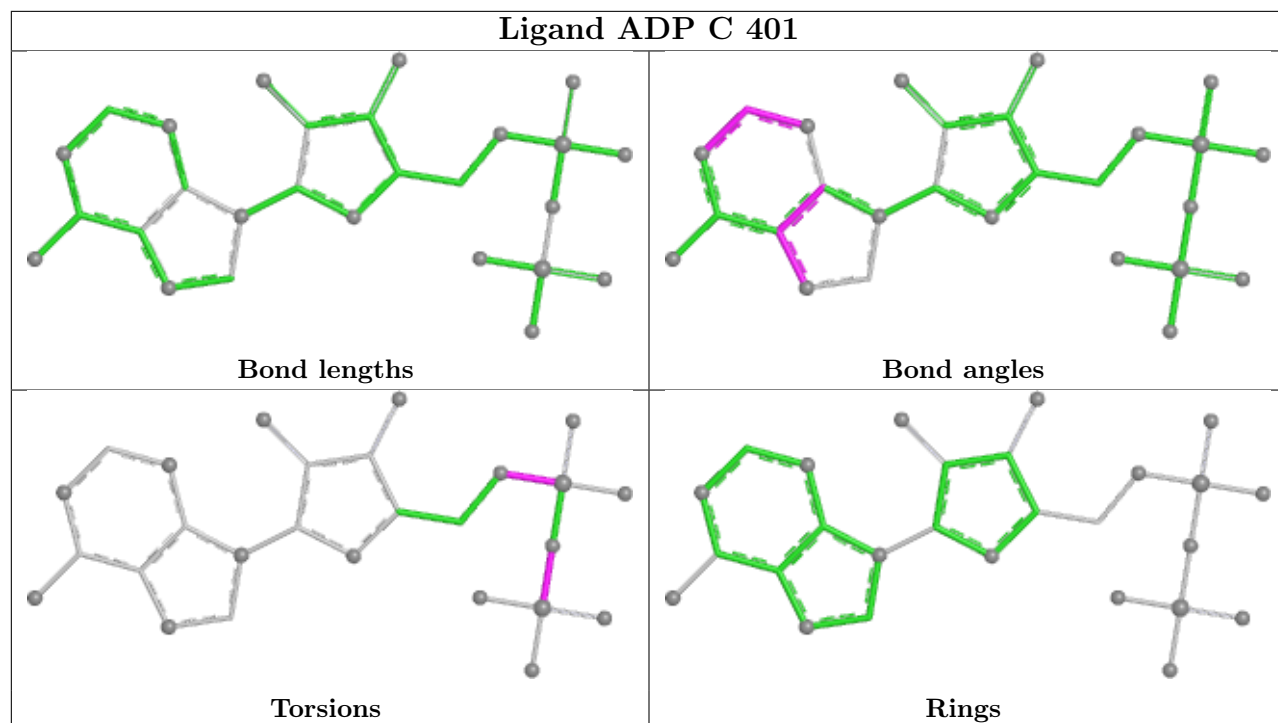
5 monomers are involved in 12 short contacts:

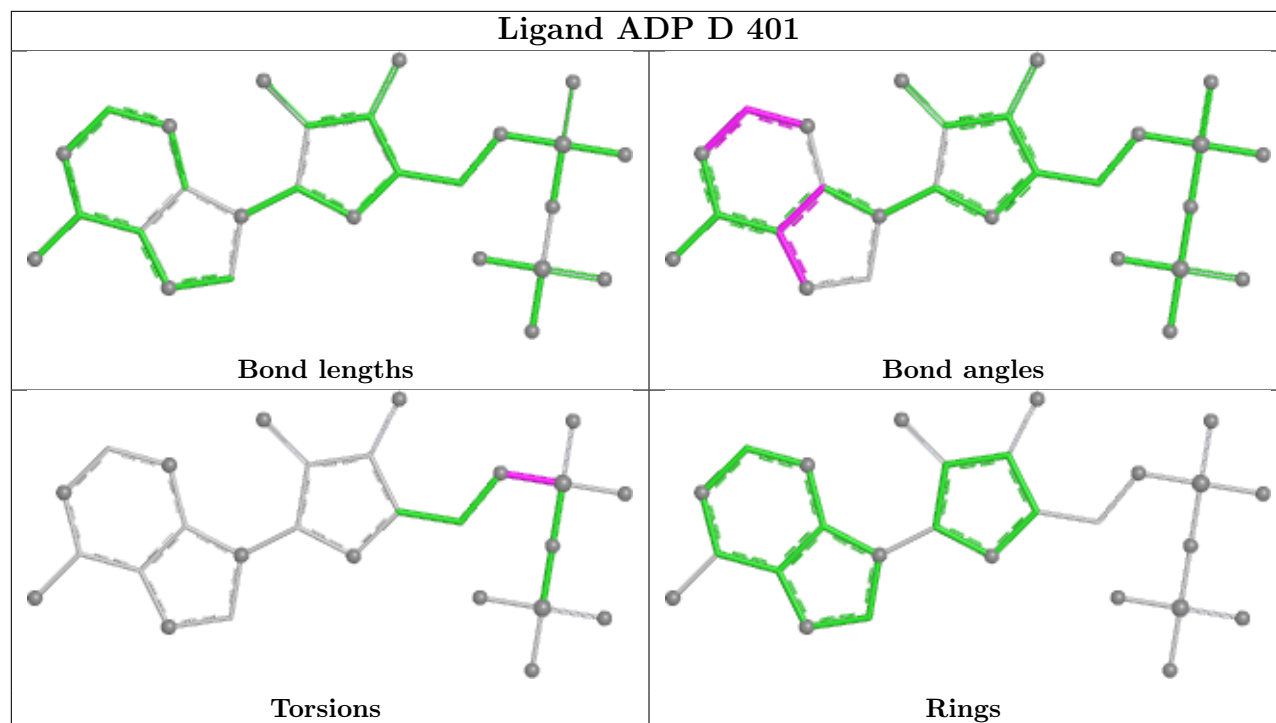
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	401	ADP	3	0
3	E	401	ADP	1	0
3	C	401	ADP	3	0
3	A	401	ADP	2	0
3	D	401	ADP	3	0

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.

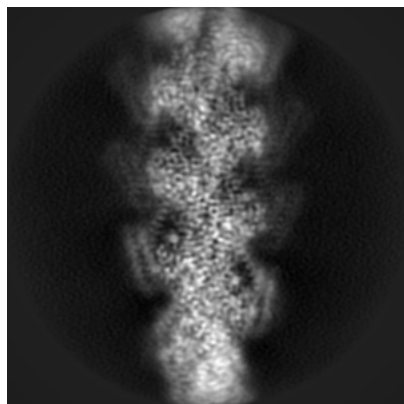
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44013. These allow visual inspection of the internal detail of the map and identification of artifacts.

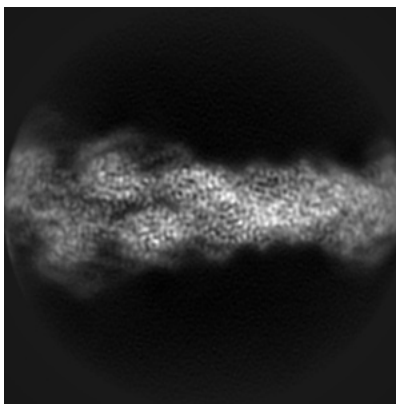
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

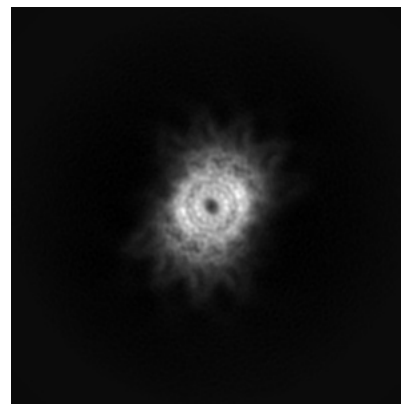
#### 6.1.1 Primary map



X

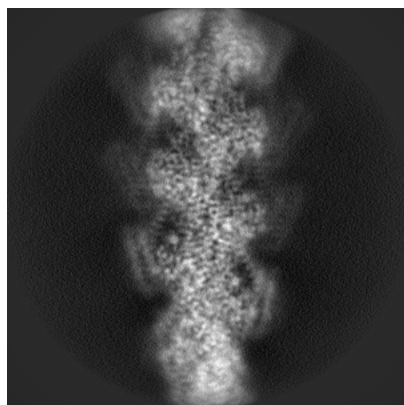


Y

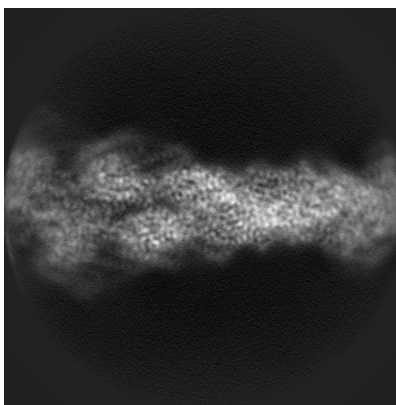


Z

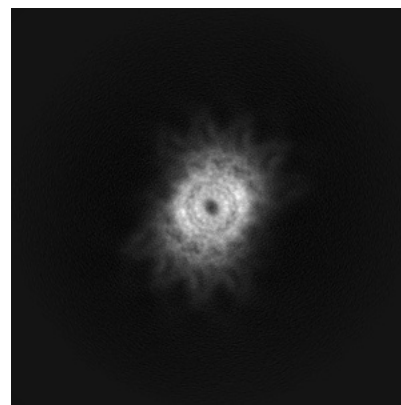
#### 6.1.2 Raw map



X



Y

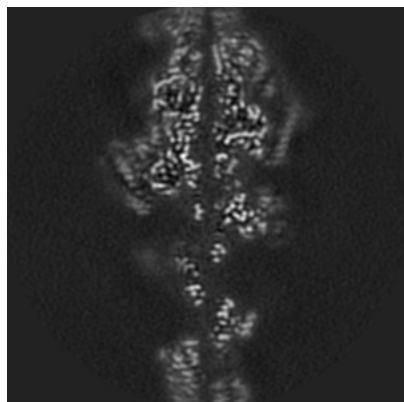


Z

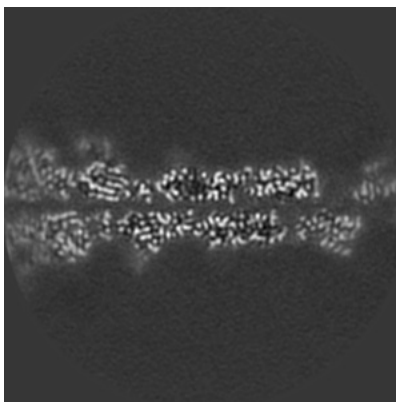
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

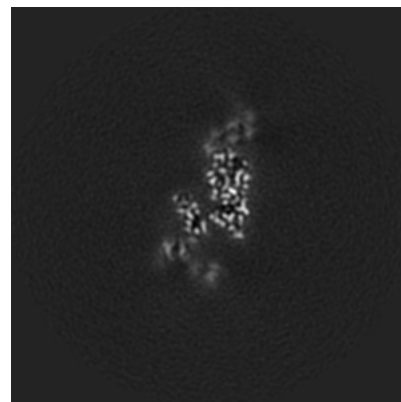
### 6.2.1 Primary map



X Index: 160

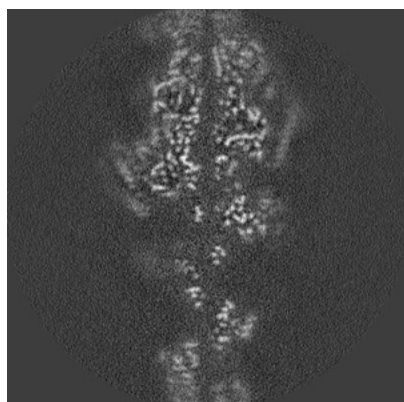


Y Index: 160

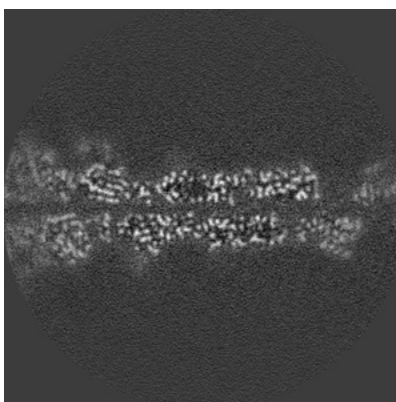


Z Index: 160

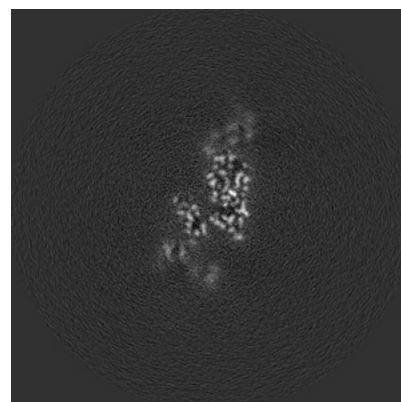
### 6.2.2 Raw map



X Index: 160



Y Index: 160

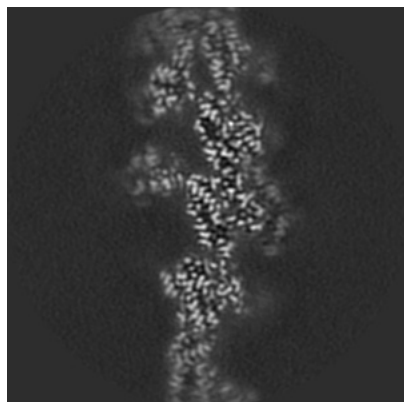


Z Index: 160

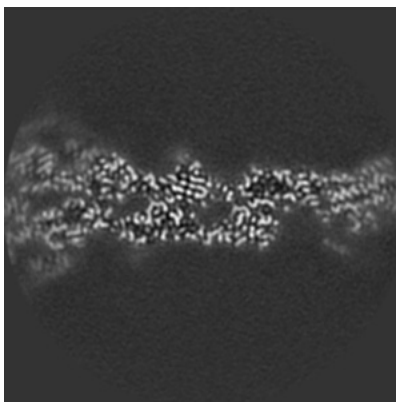
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

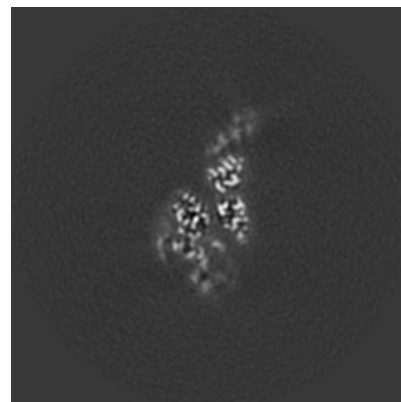
### 6.3.1 Primary map



X Index: 170

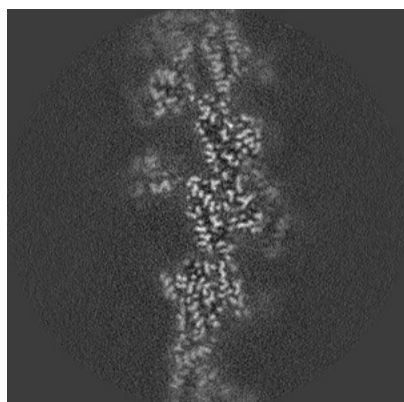


Y Index: 168

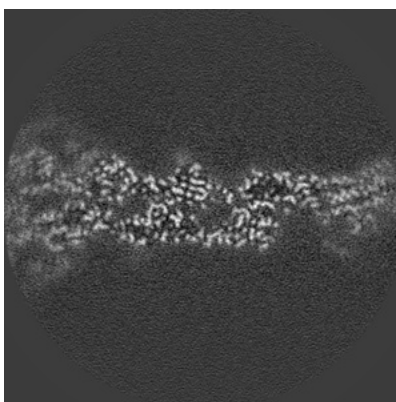


Z Index: 169

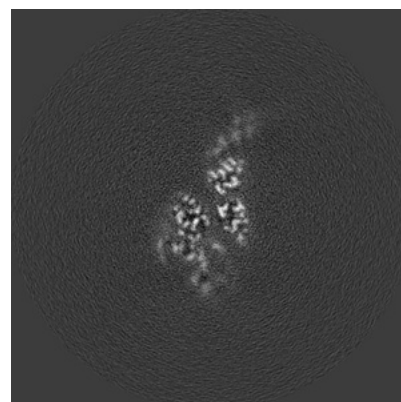
### 6.3.2 Raw map



X Index: 171



Y Index: 168

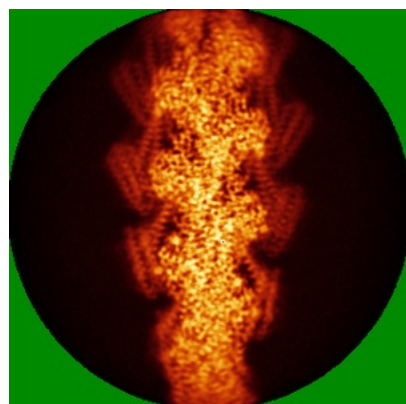


Z Index: 169

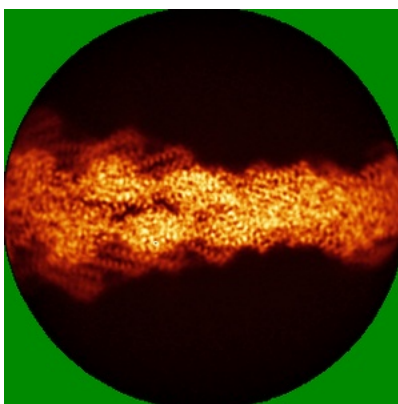
The images above show the largest variance slices of the map in three orthogonal directions.

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

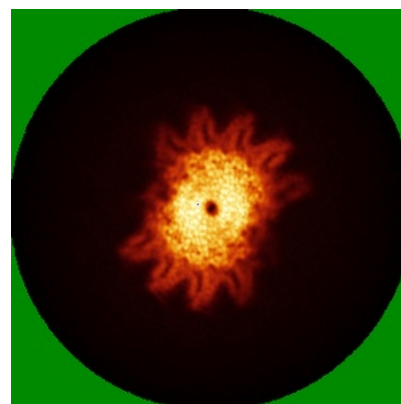
### 6.4.1 Primary map



X

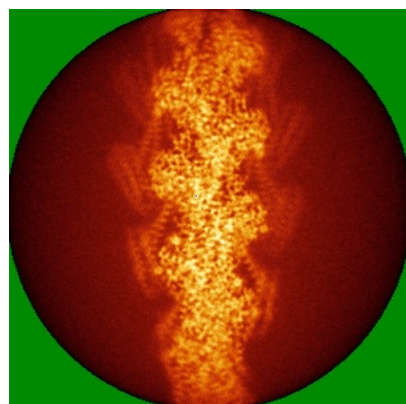


Y

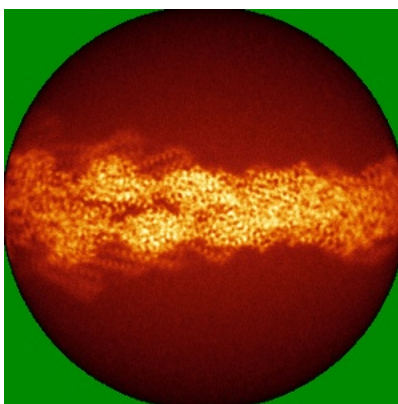


Z

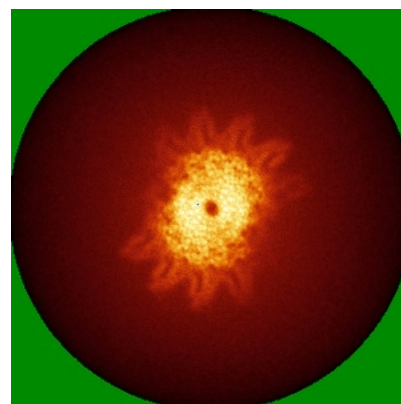
### 6.4.2 Raw map



X



Y

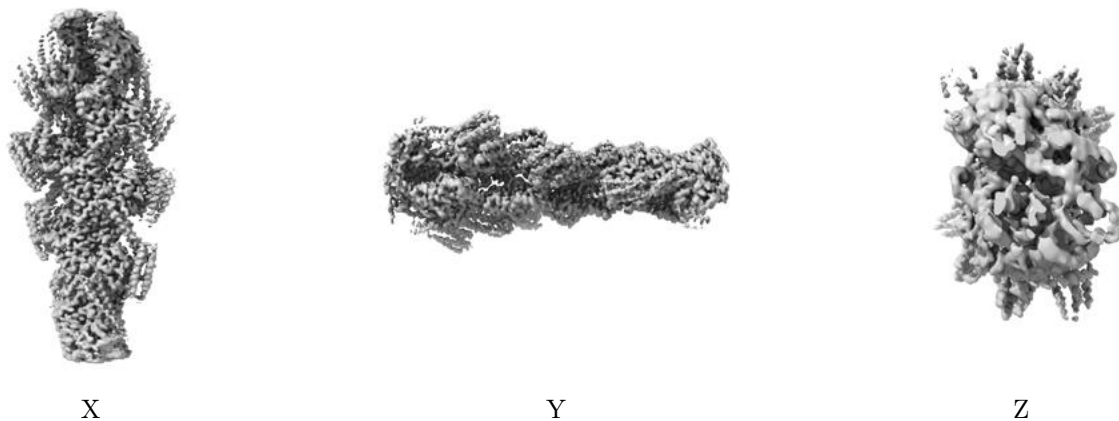


Z

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.

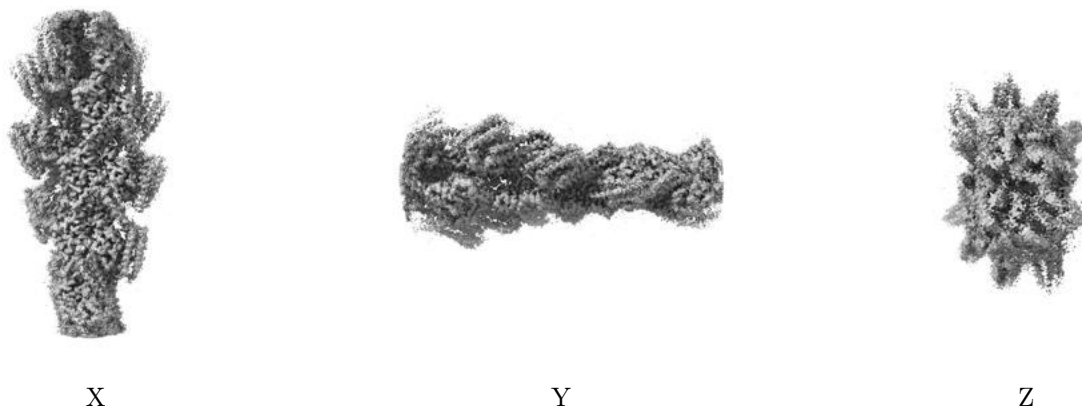
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.009. 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](#)

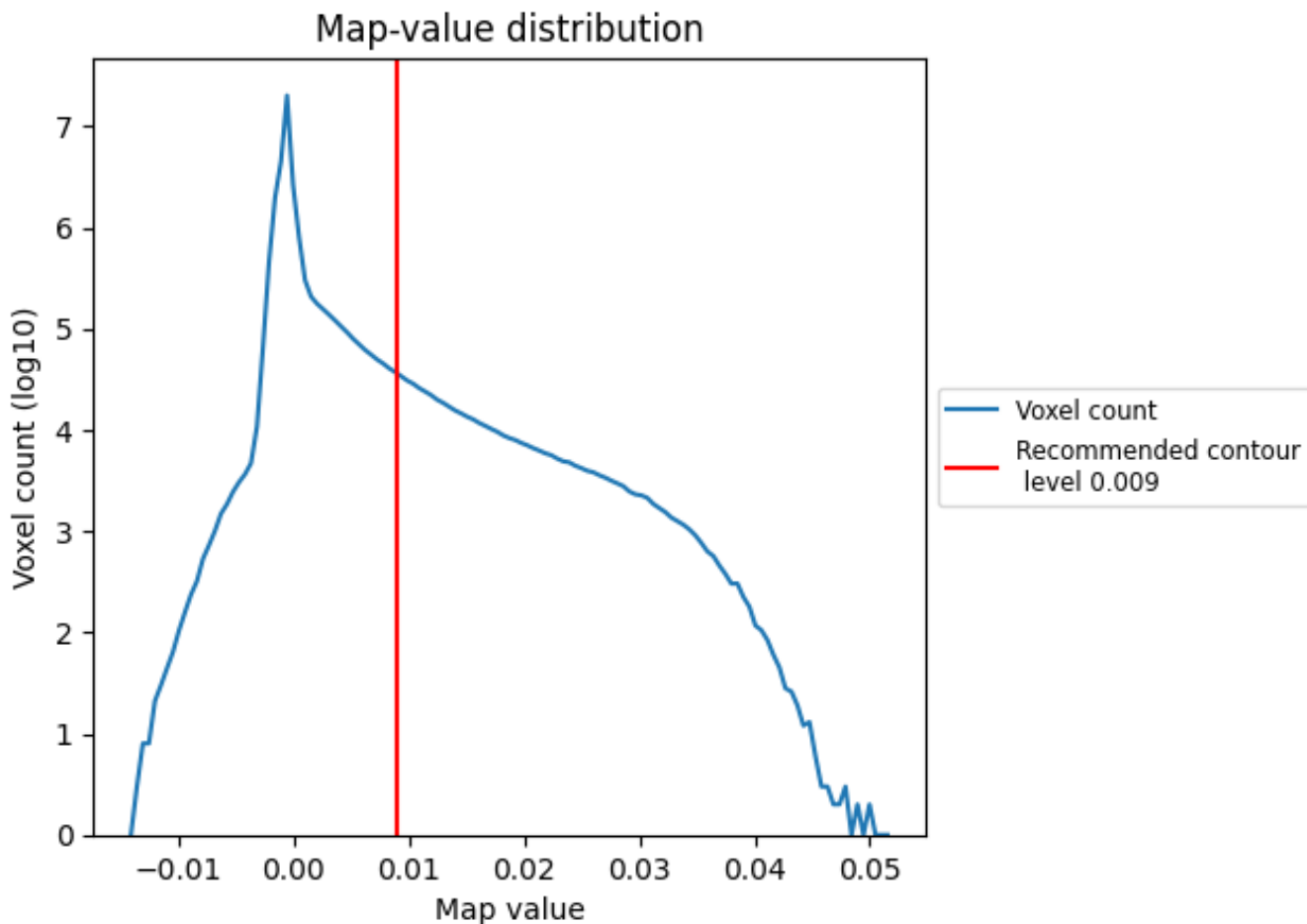
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

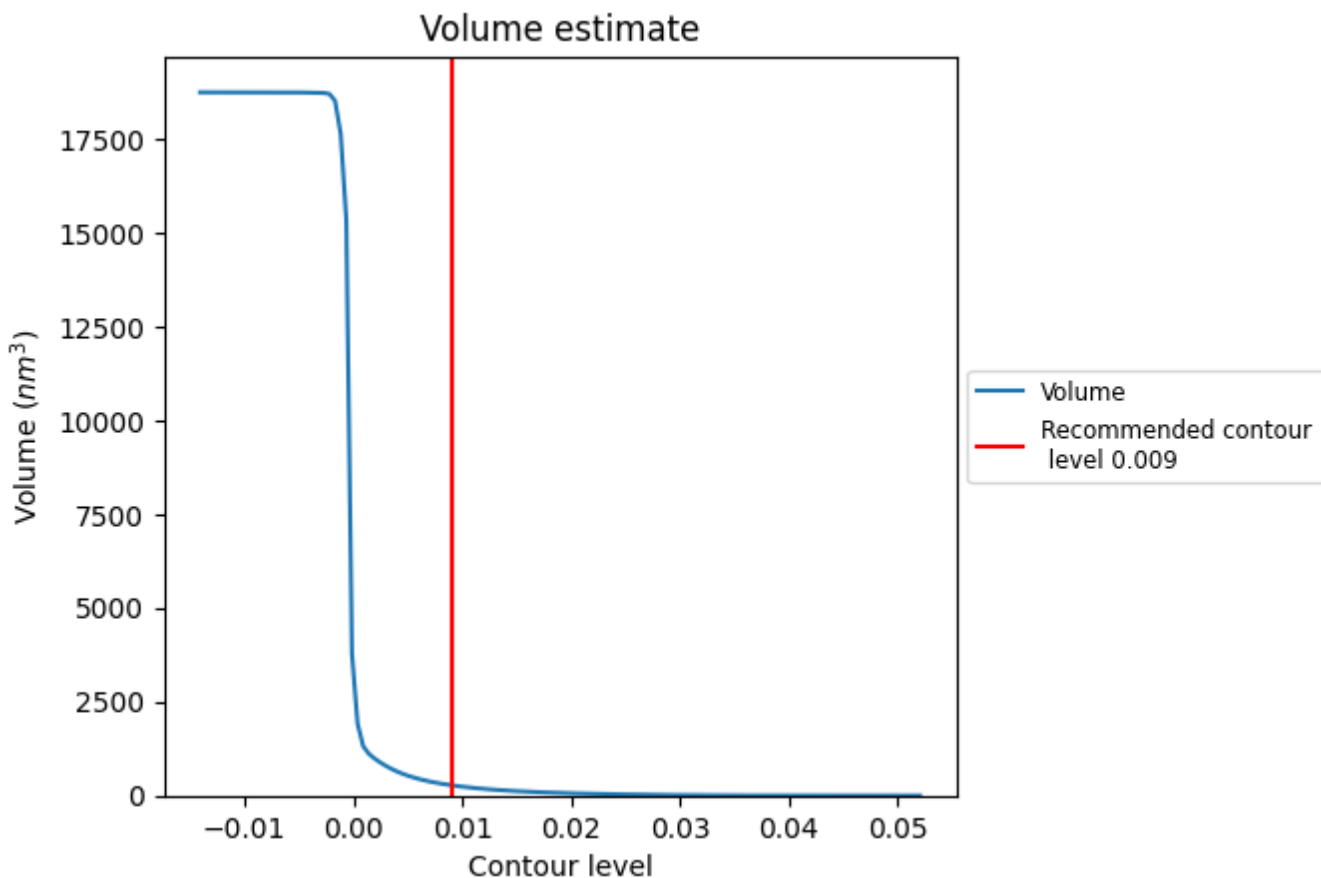
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

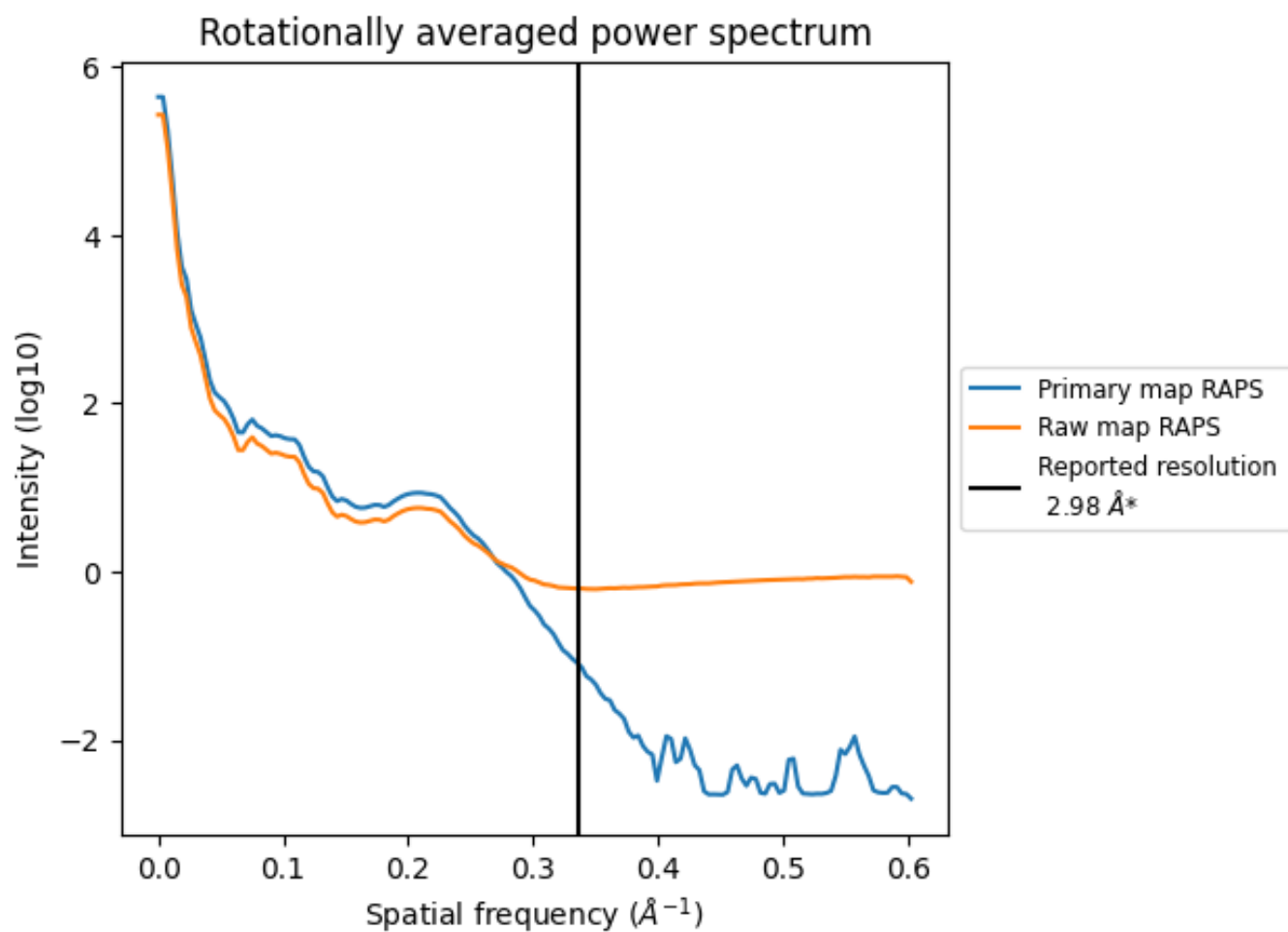
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 274  $\text{nm}^3$ ; this corresponds to an approximate mass of 247 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

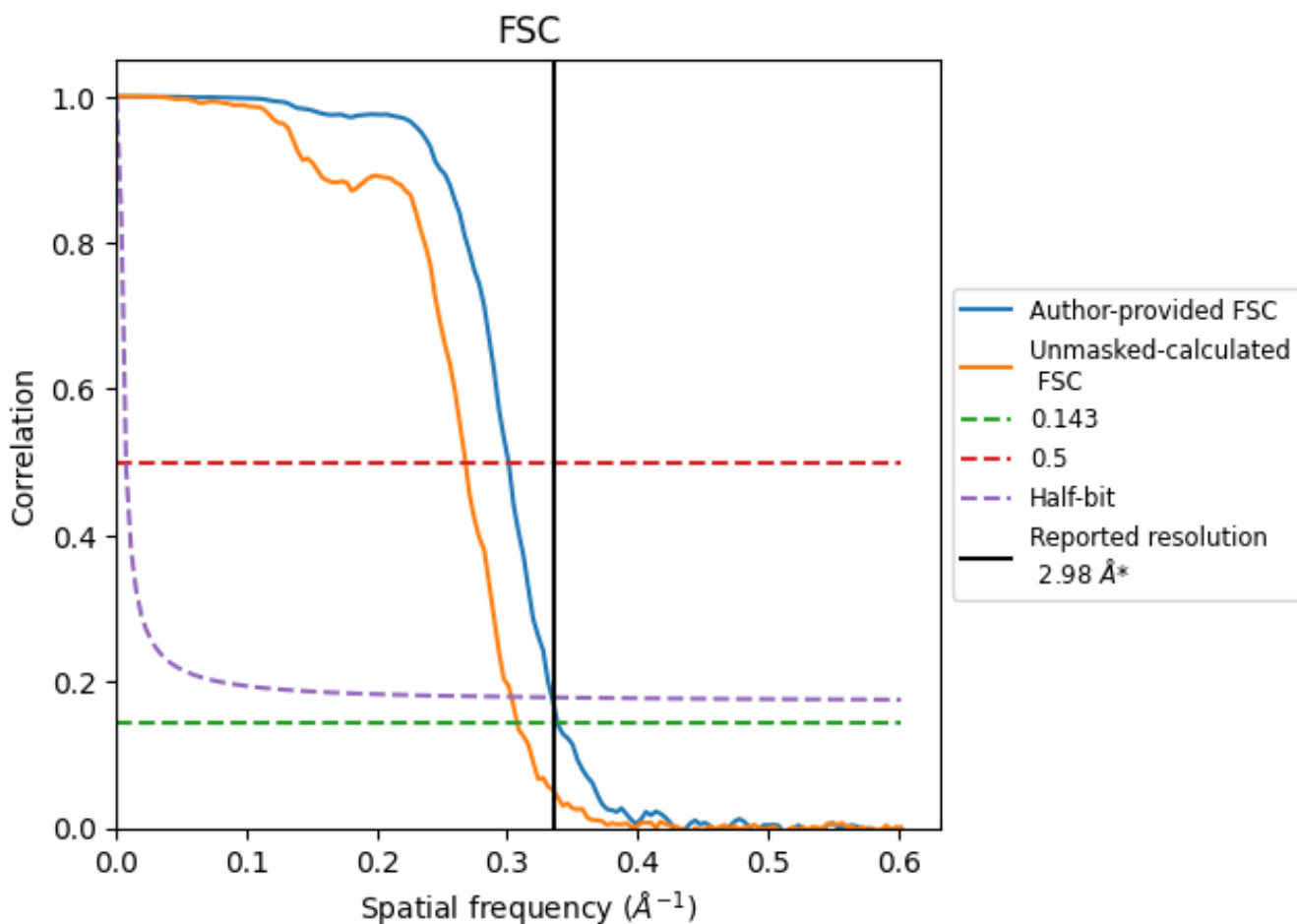


\*Reported resolution corresponds to spatial frequency of 0.336 Å<sup>-1</sup>

## 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 0.336 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

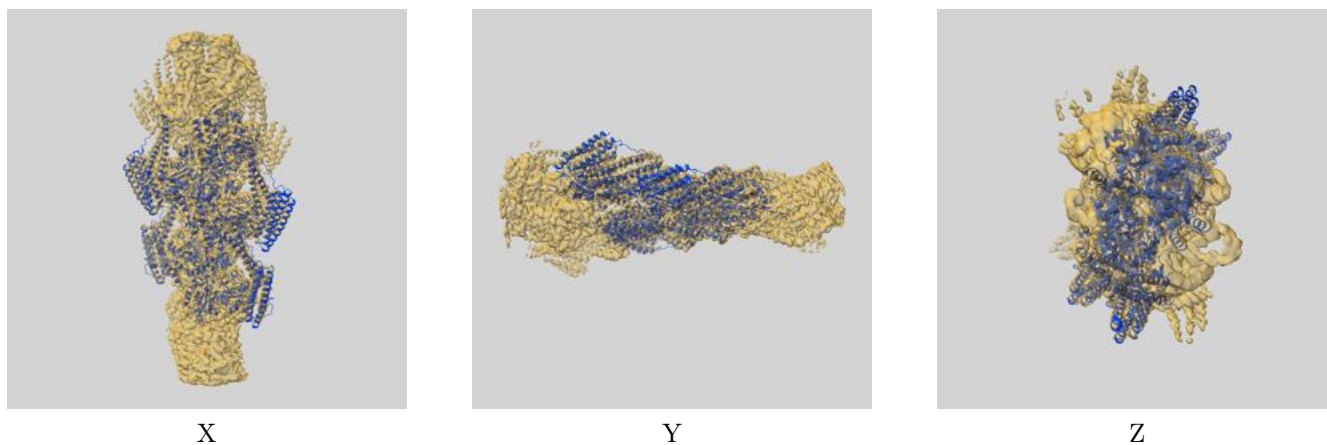
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.98	-	-
Author-provided FSC curve	2.95	3.32	2.99
Unmasked-calculated*	3.25	3.73	3.30

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

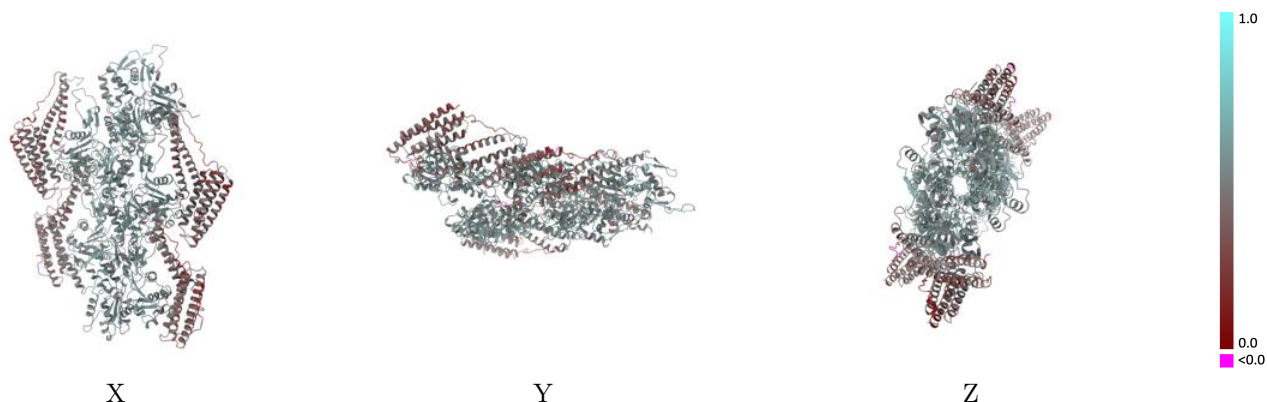
This section contains information regarding the fit between EMDB map EMD-44013 and PDB model 9AZ6. Per-residue inclusion information can be found in section 3 on page 7.

### 9.1 Map-model overlay [i](#)



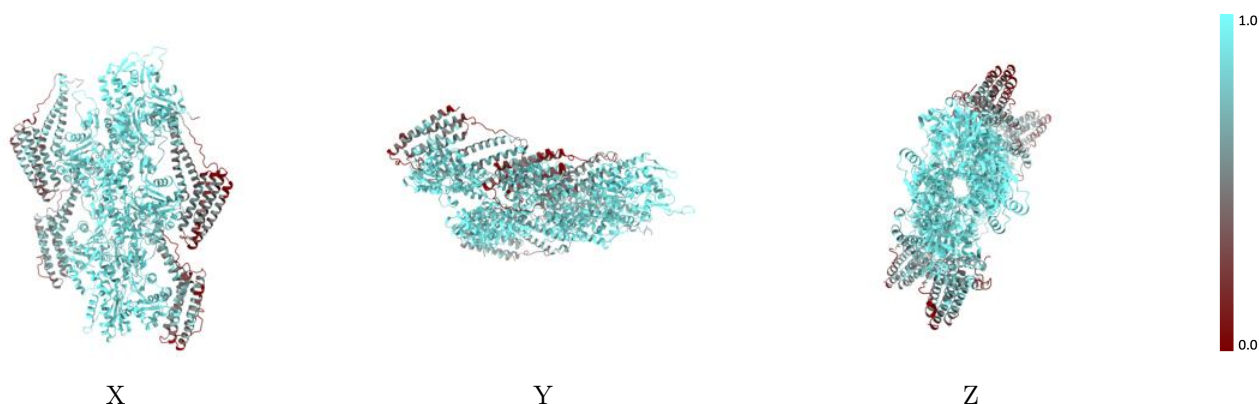
The images above show the 3D surface view of the map at the recommended contour level 0.009 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



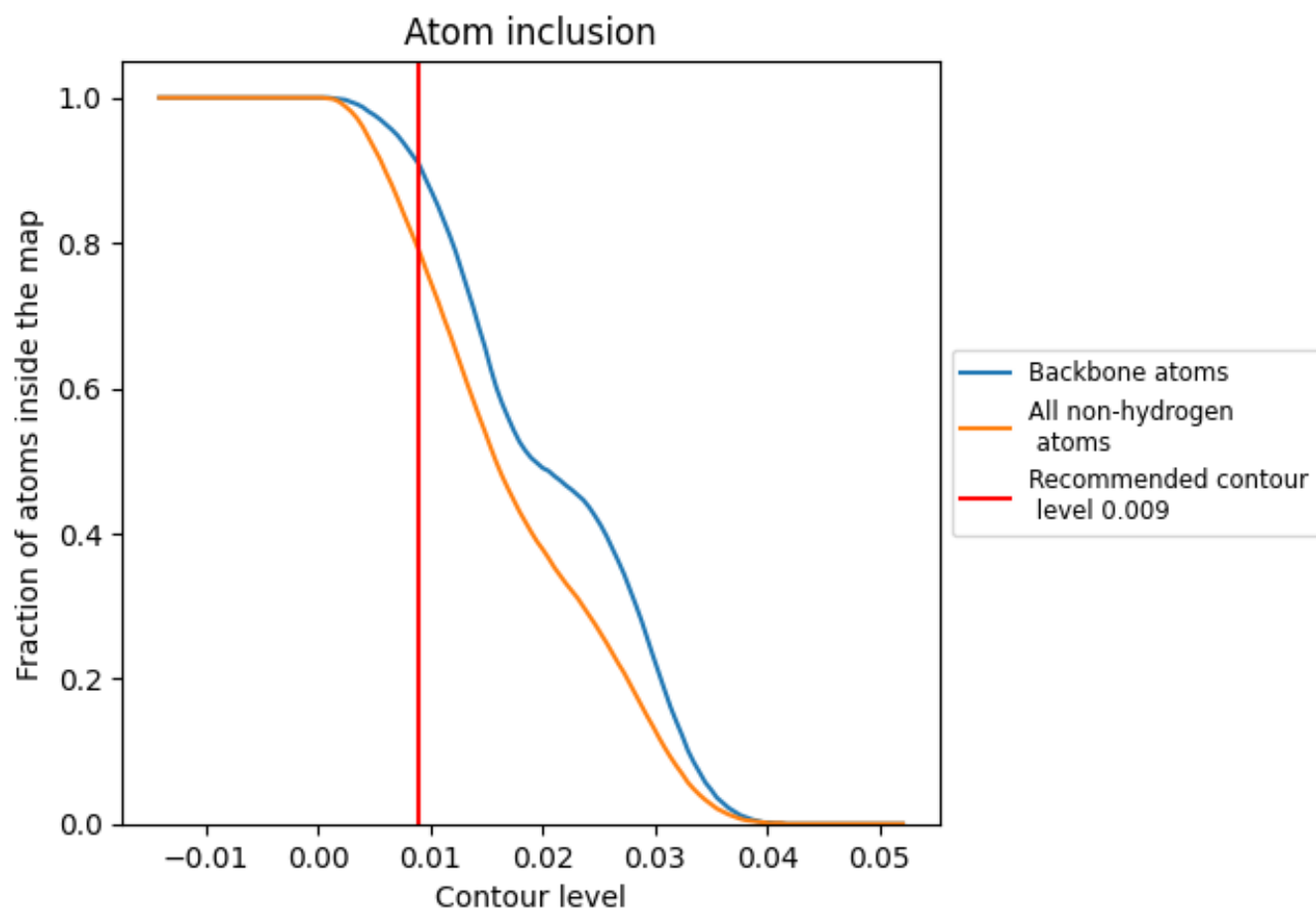
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.009).

## 9.4 Atom inclusion [i](#)































At the recommended contour level, 91% of all backbone atoms, 79% 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 (0.009) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7890	 0.4850
A	 0.9280	 0.5390
B	 0.9330	 0.5460
C	 0.9340	 0.5500
D	 0.9310	 0.5460
E	 0.9170	 0.5410
F	 0.5350	 0.3560
G	 0.6150	 0.3750
H	 0.3650	 0.3540
I	 0.4740	 0.4050
J	 0.5470	 0.3610
K	 0.7080	 0.4030
L	 0.4590	 0.3480
M	 0.5940	 0.4020

