W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

May 18, 2025 – 07:18 PM EDT

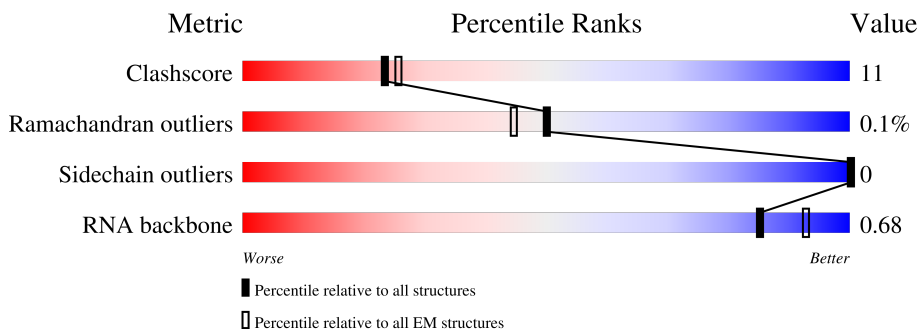|		
PDB ID	:	8TVX / pdb_00008tvx
EMDB ID	:	EMD-41654
Title	:	Cryo-EM structure of CPD-stalled Pol II (Conformation 2)
Authors	:	Sarsam, R.D.; Lahiri, I.; Leschziner, A.E.
Deposited on	:	2023-08-18
Resolution	:	3.70 Å(reported)

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 3.70 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	Percentile Ranks	Value
Clashscore		11
Ramachandran outliers		0.1%
Sidechain outliers		0
RNA backbone		0.68

Worse   *Better*

▌ Percentile relative to all structures

▐ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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 <=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	1733	63% 16% 21%
2	B	1224	70% 15% 15%
3	C	318	72% 12% 16%
4	D	221	19% / 49% 15% 36%
5	E	215	80% 20%
6	F	155	34% 19% 48%
7	G	171	30% / 78% 22%

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Mol	Chain	Length	Quality of chain
8	H	146	66%　　　25%　　9%
9	I	122	75%　　　20%
10	J	70	63%　　　30%　　7%
11	K	120	69%　　　18%　　13%
12	L	70	49%　　17%　　34%
13	N	47	36%　　　64%
14	T	47	9%　　51%　　38%
15	R	10	80%　　　20%

2 Entry composition ⓘ

There are 17 unique types of molecules in this entry. The entry contains 59080 atoms, of which 28632 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 DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	1367	Total	C	H	N	O	S	0	0
			21595	6779	10846	1885	2024	61		

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	1041	Total	C	H	N	O	S	0	0
			16378	5223	8141	1435	1526	53		

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	C	266	Total	C	H	N	O	S	0	0
			4146	1317	2051	348	417	13		

- Molecule 4 is a protein called DNA-directed RNA polymerase II subunit RPB4.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	D	142	Total	C	H	N	O	S	0	0
			2066	667	990	191	216	2		

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	E	215	Total	C	H	N	O	S	0	0
			3548	1116	1788	310	322	12		

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	F	81	Total	C	H	N	O	S	0	0
			1330	419	673	111	124	3		

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	G	171	Total	C	H	N	O	S	0	0
			1806	701	696	198	207	4		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	H	133	Total	C	H	N	O	S	0	0
			2090	668	1030	174	213	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	I	117	Total	C	H	N	O	S	0	0
			1303	479	515	151	153	5		

- Molecule 10 is a protein called DNA-directed RNA polymerases II subunit RPABC5.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	J	65	Total	C	H	N	O	S	0	0
			1074	339	542	93	94	6		

- Molecule 11 is a protein called DNA-directed RNA polymerase II subunit RPB11.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	K	104	Total	C	H	N	O	S	0	0
			1673	534	839	142	157	1		

- Molecule 12 is a protein called DNA-directed RNA polymerases II subunit RPABC4.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	L	46	Total	C	H	N	O	S	0	0
			751	224	387	72	64	4		

- Molecule 13 is a DNA chain called DNA (NTS).

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	17	Total	C	N	O	P	0	0
			361	168	81	96	16		

- Molecule 14 is a DNA chain called DNA (TS).

Mol	Chain	Residues	Atoms						AltConf	Trace
14	T	29	Total 620	C 287	H 24	N 88	O 191	P 30	0	0

- Molecule 15 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	R	10	Total 330	C 98	H 110	N 45	O 67	P 10	0	0

- Molecule 16 is ZINC ION (CCD ID: ZN) (formula: Zn).

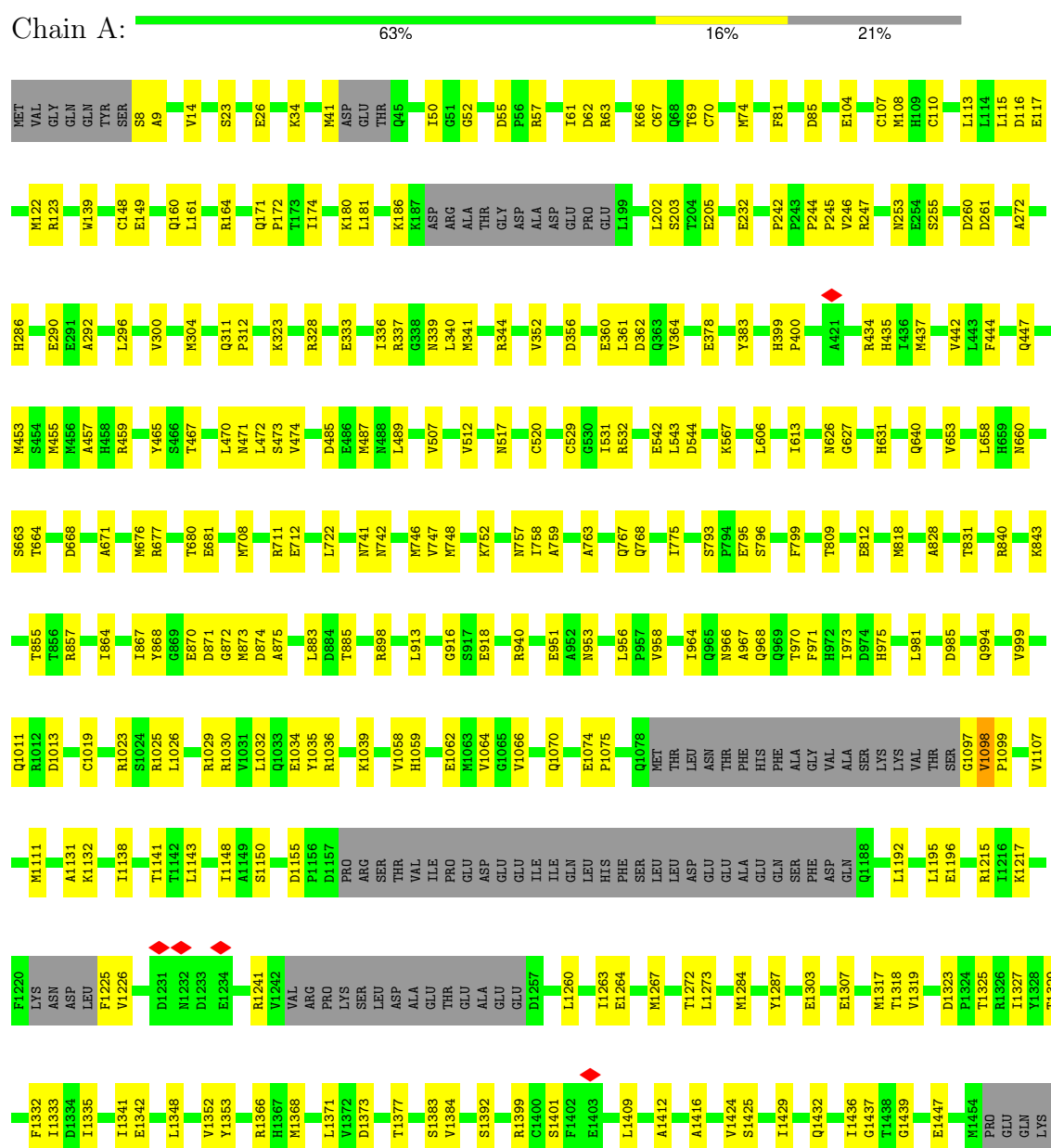| Mol	Chain	Residues	Atoms		AltConf
16	A	2	Total 2	Zn 2	0
16	B	1	Total 1	Zn 1	0
16	C	1	Total 1	Zn 1	0
16	I	2	Total 2	Zn 2	0
16	J	1	Total 1	Zn 1	0
16	L	1	Total 1	Zn 1	0

- Molecule 17 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
17	A	1	Total 1	Mg 1	0

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.

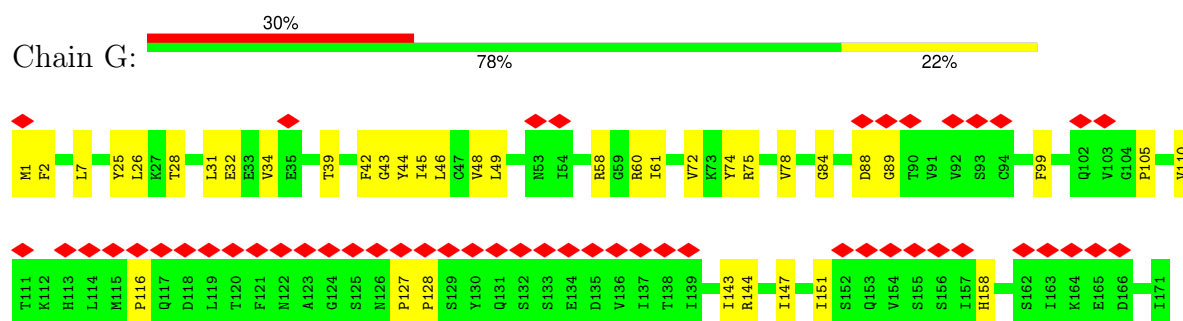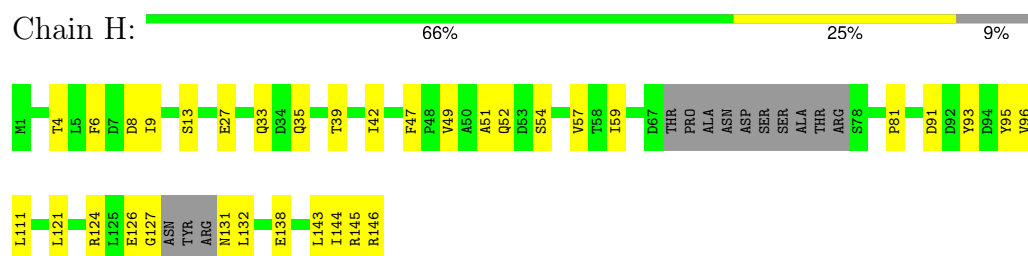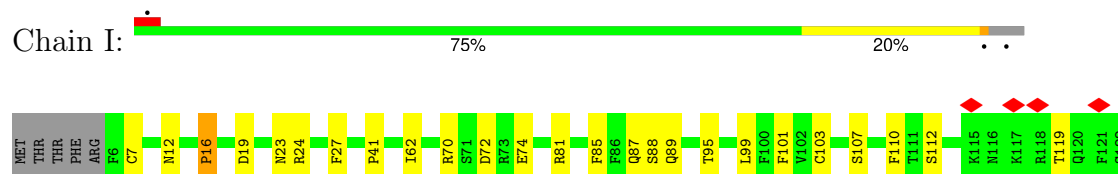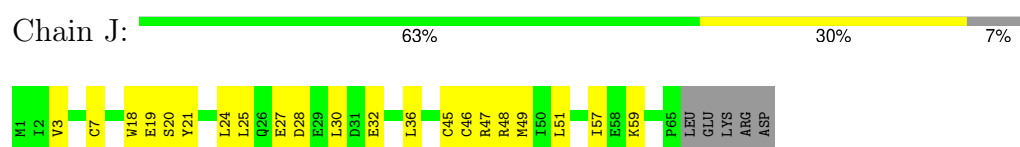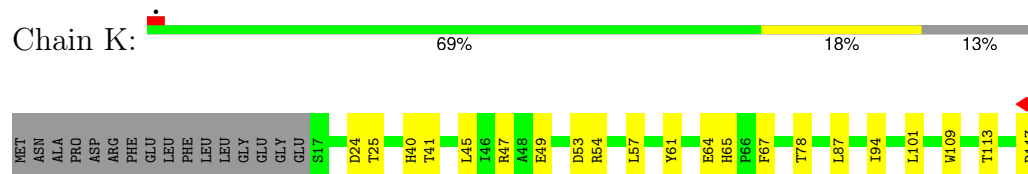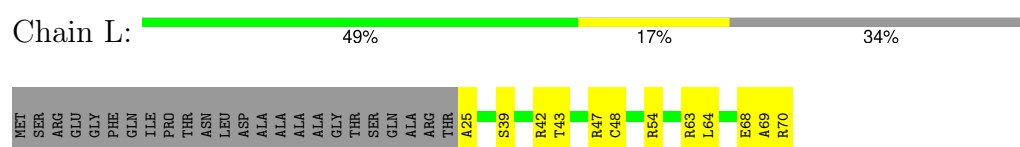• Molecule 1: DNA-directed RNA polymerase II subunit RPB1

• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain B:
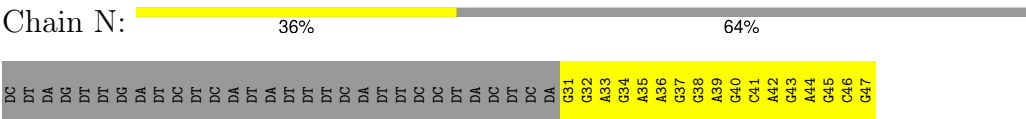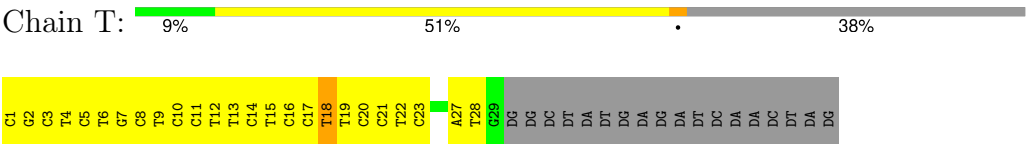

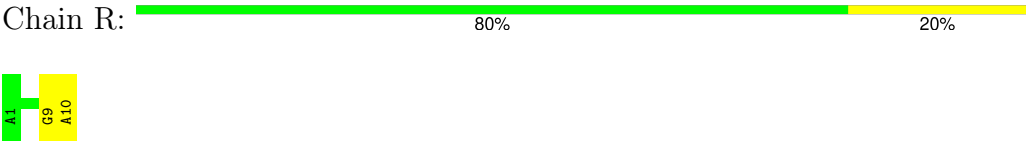• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

Chain C:

MET SER E3 E4 G5 P6 Q7 R11 V18 N24 V25 I38 T55 L58 R66 Q73 S74 M75 E89 D90 H91 L99 G105 I133 R148 E152 G162 I163 A164 K165 K169 W170 I176 D181 N184 K185 N206 E210

D226 V240 D241 Q242 R246 L262 D268 LYS VAL ASN PHE ALA SER GLY ASP ASN ASN THR ALA SER ASN MET LEU GLY SER ASN GLU ASP VAL MET MET THR GLY ALA GLU GLN ASP PRO TYR SER ASN ALA SER GLN MET GLY ASN THR GLY SER GLY GLY TYR ASP ASN ALA

TRP

• Molecule 4: DNA-directed RNA polymerase II subunit RPB4

Chain D:

19%

49%   15%   36%

MET ASN VAL SER THR SER PHE GLN THR ARG ARG ARG LEU LYS LYS Q37 I38 N39 E44 E45 N51 L52 R56 L57 V58 I59 K60 E61 A62 L63 V64 E65 R66 R67 R68 A69

F70 K71 R72 S73 GLN LYS LYS HIS LYS LYS LYS HIS LEU LYS HIS GLU ASN ALA ASN ASP GLU THR THR ALA VAL GLU GLU ASP ASP LEU GLU ASP ASP VAL ASN ALA ASP ASP ASP PHE MET HIS SER E117 E120 K121 E122 L123 E124 S125 I126 D127 V128 L129 L130

E131 Q132 T133 T134 G135 G136 D140 L141 M145 Q146 Y147 F151 S152 R153 F154 R155 D156 Q157 V160 V163 L167 K168 L172 H173 E176 V177 A178 G181 S182 L183 A184 C185 D186 D189 K192 T193 N199 I202 S203 D204 D205 E206 L207 L211 L214

L220 Y221

• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1

Chain E:

80%   20%

M1 D2 Q3 E4 N5 E6 R7 Y28 K43 Y46 C47 M50 G51 R52 P53 Q54 R55 K56 M57 M58 A62 E66 G76 S77 L78 W79 V80 E81 F82 M93 I100 K103 N104 V111 I116 A120 M121 V124 P125 V141 S157 E160

R169 L170 K171 Q174 R200 K201 S202 S205 S210 M215

• Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F:

34%   19%   48%

MET SER ASP TYR GLU GLU ALA PHE ASN ASP GLY ASN GLU ASN GLU PHE GLU ASP PHE ASP VAL HIS PHE SER ASP GLU GLU THR TYR GLU GLU LYS PRO GLN PHE LYS ASP GLY GLU THR ALA ALA ASN GLY LYS THR ILE VAL THR GLY GLY ASN GLY PRO GLU ASP PHE GLN GLN

HIS GLU GLN ILE ARG ARG LYS THR LEU GLU LYS GLU LYS ALA ILE P75 P83 Y84 M85 T86 K87 Y88 E89 R90 T96 Q100 V109 D110 L111 L118 R119 M122 K123 E124 L125 K128 K129 I130 P131 L132 V133 L138 P139 D140 G141 S142 W146 S147 V148 L151 I152

V153 D154 L155

• Molecule 7: DNA-directed RNA polymerase II subunit RPB7

Chain G:

30%   78%   22%

M1 F2 L7 Y25 L26 K27 T28 L31 E32 E33 V34 E35 T39 F42 G43 Y44 I45 L46 C47 V48 L49 N53 I54 R58 G59 R60 I61 V72 K73 Y74 R75 V78 G84 D88 G89 T90 V91 V92 S93 C94 F99 Q102 V103 G104 P105 V110

T111 K112 H113 L114 M115 P116 Q117 D118 L119 T120 F121 N122 A123 G124 S125 N126 P127 P128 S129 Y130 Q131 S132 S133 E134 D135 V136 I137 T138 I139 I143 R144 I147 I151 S152 Q153 V154 S155 S156 I157 H158 S162 I163 K164 E165 D166 I171

• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:

66%   25%   9%

M1 T4 L5 F6 D7 D8 I9 S13 E27 Q33 D34 Q35 T39 I42 F47 P48 V49 A50 A51 Q52 D53 S54 V57 T58 I59 D67 THR PRO ALA ASN ASP SER SER ALA THR ARG S78 P81 D91 D92 Y93 D94 Y95 V96 M97 Y102 D110

L111 L121 R124 L125 E126 G127 ASN TYR ARG N131 L132 E138 L143 I144 R145 R146

• Molecule 9: DNA-directed RNA polymerase II subunit RPB9

Chain I:

75%   20%   • •

MET THR THR PHE ARG F6 C7 N12 P16 D19 N23 R24 F27 P41 I62 R70 S71 D72 R73 E74 R81 F85 F86 Q87 S88 Q89 T95 L99 F100 F101 V102 C103 S107 F110 T111 S112 K115 N116 K117 R118 T119 Q120 F121 S122

• Molecule 10: DNA-directed RNA polymerases II subunit RPABC5

Chain J:

63%   30%   7%

M1 I2 V3 C7 W18 E19 S20 Y21 L24 L25 Q26 E27 D28 E29 L30 D31 E32 L36 C45 C46 R47 R48 M49 I50 L51 I57 E58 K59 P65 LEU GLU LYS ARG ASP

• Molecule 11: DNA-directed RNA polymerase II subunit RPB11

Chain K:

69%   18%   13%

MET ASN ALA PRO ASP ARG PHE GLU LEU PHE LEU LEU GLY GLU GLU S17 D24 T25 H40 T41 L45 I46 R47 A48 E49 D53 R54 L57 Y61 E64 H65 P66 F67 T78 L87 I94 L101 W109 T113 D117 D118 A119 F120

• Molecule 12: DNA-directed RNA polymerases II subunit RPABC4

Chain L:

49%   17%   34%

MET SER ARG GLU GLY PHE GLN ILE PRO THR ASN LEU ASP ALA ALA ALA GLY THR SER GLN ALA ARG THR A25 S39 R42 T43 R47 C48 R54 R63 L64 E68 A69 R70

• Molecule 13: DNA (NTS)

Chain N:

| 36% | 64% |

DC DT DA DG DT DT DG DA DT DC DT DC DA DT DA DT DT DC DA DT DT DC DC DT DA DC DT DA | G31 G32 A33 G34 A35 A36 G37 G38 A39 G40 C41 A42 G43 A44 G45 C46 G47

• Molecule 14: DNA (TS)

Chain T:

| 9% | 51% | • | 38% |

C1 G2 C3 T4 C5 T6 G7 C8 T9 C10 C11 T12 T13 C14 T15 C16 C17 T18 T19 C20 C21 T22 C23 A27 T28 G29 DG DG DC DT DA DT DG DA DG DA DT DC DA DC DT DA DG

• Molecule 15: RNA

Chain R:

| 80% | 20% |

A1 G9 A10

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	73000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/\text{Å}^2)$	59	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.994	Depositor
Minimum map value	-0.720	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.060	Depositor
Recommended contour level	0.24	Depositor
Map size (Å)	445.44, 445.44, 445.44	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.16, 1.16, 1.16	Depositor

5　Model quality ⓘ

5.1　Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MG, TTD, ZN

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	0.16	0/10939	0.32	0/14785
2	B	0.17	0/8396	0.33	1/11323 (0.0%)
3	C	0.18	0/2133	0.31	0/2891
4	D	0.14	0/1084	0.40	0/1460
5	E	0.14	0/1796	0.34	0/2416
6	F	0.19	0/669	0.40	0/903
7	G	0.22	0/1126	0.65	4/1531 (0.3%)
8	H	0.19	0/1076	0.36	0/1455
9	I	0.16	0/798	0.57	2/1082 (0.2%)
10	J	0.21	0/541	0.38	0/727
11	K	0.18	0/850	0.29	0/1148
12	L	0.14	0/366	0.34	0/485
13	N	0.19	0/407	0.29	0/629
14	T	0.19	0/615	0.35	0/941
15	R	0.12	0/247	0.18	0/384
All	All	0.17	0/31043	0.36	7/42160 (0.0%)

There are no bond length outliers.

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	G	116	PRO	N-CA-CB	8.81	111.12	103.19
2	B	877	PRO	N-CA-CB	8.76	111.11	103.31
7	G	127	PRO	N-CA-CB	7.71	111.08	102.60
9	I	41	PRO	N-CA-CB	7.61	111.09	103.48
9	I	16	PRO	N-CA-CB	7.49	111.11	103.25

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	10749	10846	10846	213	0
2	B	8237	8141	8178	138	0
3	C	2095	2051	2053	23	0
4	D	1076	990	1032	26	0
5	E	1760	1788	1788	33	0
6	F	657	673	673	26	0
7	G	1110	696	882	23	0
8	H	1060	1030	1030	32	0
9	I	788	515	622	16	0
10	J	532	542	542	19	0
11	K	834	839	839	17	0
12	L	364	387	388	8	0
13	N	361	0	189	49	0
14	T	596	24	343	57	0
15	R	220	110	110	2	0
16	A	2	0	0	0	0
16	B	1	0	0	0	0
16	C	1	0	0	0	0
16	I	2	0	0	0	0
16	J	1	0	0	0	0
16	L	1	0	0	0	0
17	A	1	0	0	0	0
All	All	30448	28632	29515	614	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 11.

The worst 5 of 614 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)
14:T:21:DC:H2"	14:T:22:DT:H5'	1.27	1.08
14:T:12:DT:H2'	14:T:13:DT:H71	1.45	0.97
6:F:118:LEU:HD23	6:F:122:MET:HE2	1.50	0.93
1:A:1062:GLU:OE1	6:F:88:TYR:OH	1.89	0.90
4:D:56:ARG:NH2	4:D:152:SER:OG	2.04	0.89

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	1353/1733 (78%)	1292 (96%)	59 (4%)	2 (0%)	48	78
2	B	1019/1224 (83%)	973 (96%)	46 (4%)	0	100	100
3	C	264/318 (83%)	259 (98%)	5 (2%)	0	100	100
4	D	138/221 (62%)	136 (99%)	2 (1%)	0	100	100
5	E	213/215 (99%)	205 (96%)	8 (4%)	0	100	100
6	F	79/155 (51%)	76 (96%)	3 (4%)	0	100	100
7	G	169/171 (99%)	164 (97%)	4 (2%)	1 (1%)	22	54
8	H	127/146 (87%)	113 (89%)	14 (11%)	0	100	100
9	I	115/122 (94%)	111 (96%)	4 (4%)	0	100	100
10	J	63/70 (90%)	61 (97%)	2 (3%)	0	100	100
11	K	102/120 (85%)	101 (99%)	1 (1%)	0	100	100
12	L	44/70 (63%)	40 (91%)	4 (9%)	0	100	100
All	All	3686/4565 (81%)	3531 (96%)	152 (4%)	3 (0%)	50	78

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1098	VAL
1	A	958	VAL
7	G	58	ARG

5.3.2 Protein sidechains ⓘ

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	1192/1520 (78%)	1192 (100%)	0	100	100
2	B	885/1061 (83%)	885 (100%)	0	100	100
3	C	234/274 (85%)	234 (100%)	0	100	100
4	D	109/200 (54%)	109 (100%)	0	100	100
5	E	197/197 (100%)	197 (100%)	0	100	100
6	F	72/137 (53%)	72 (100%)	0	100	100
7	G	75/152 (49%)	75 (100%)	0	100	100
8	H	117/128 (91%)	117 (100%)	0	100	100
9	I	64/116 (55%)	64 (100%)	0	100	100
10	J	60/65 (92%)	60 (100%)	0	100	100
11	K	89/102 (87%)	89 (100%)	0	100	100
12	L	40/57 (70%)	40 (100%)	0	100	100
All	All	3134/4009 (78%)	3134 (100%)	0	100	100

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

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	1093	GLN
9	I	108	HIS
11	K	44	ASN
9	I	120	GLN
10	J	64	ASN

5.3.3　RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
15	R	9/10 (90%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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

1 non-standard protein/DNA/RNA residue is 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	$\#|Z| > 2$
14	TTD	T	18	14	42,45,46	1.26	8 (19%)	61,74,77	2.21	14 (22%)

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
14	TTD	T	18	14	-	14/22/109/110	0/5/6/6

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	T	18	TTD	C2T-N1T	3.20	1.42	1.36
14	T	18	TTD	C5-C6	-2.60	1.52	1.55
14	T	18	TTD	C2T-N3T	-2.57	1.33	1.38
14	T	18	TTD	C4T-N3T	-2.54	1.33	1.37
14	T	18	TTD	C2-N3	-2.53	1.33	1.38

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
14	T	18	TTD	N3T-C2T-N1T	6.97	124.08	116.78
14	T	18	TTD	C5-C4-N3	5.36	120.58	116.09
14	T	18	TTD	O4'-C1'-N1	4.97	114.54	108.65
14	T	18	TTD	C2'-C1'-N1	-4.92	108.94	115.59
14	T	18	TTD	N3-C2-N1	4.89	121.90	116.78

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
14	T	18	TTD	O4'-C4R-C5'-O5'
14	T	18	TTD	O4'-C1'-N1-C2
14	T	18	TTD	C5R-O5R-PB-O3R
14	T	18	TTD	C5R-O5R-PB-O5P
14	T	18	TTD	C5R-O5R-PB-O4P

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
14	T	18	TTD	1	0

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 9 ligands modelled in this entry, 9 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-41654. 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 ⓘ
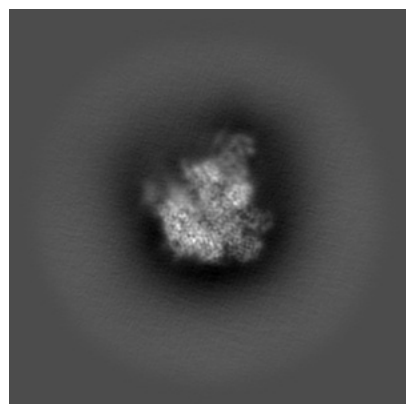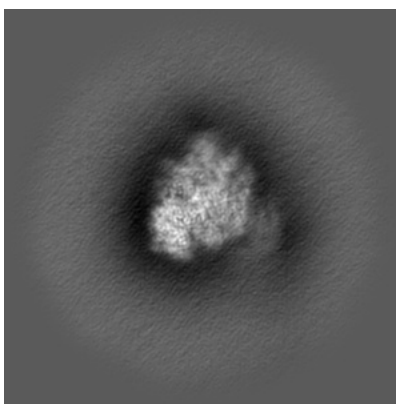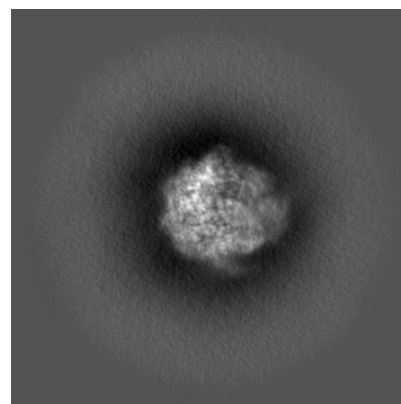
6.1.1 Primary map

X   Y   Z

6.1.2 Raw map

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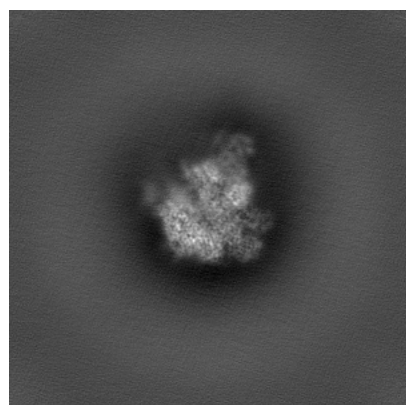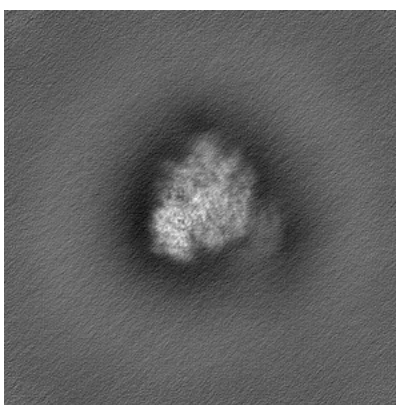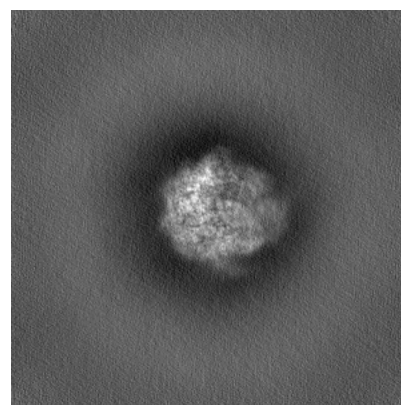
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
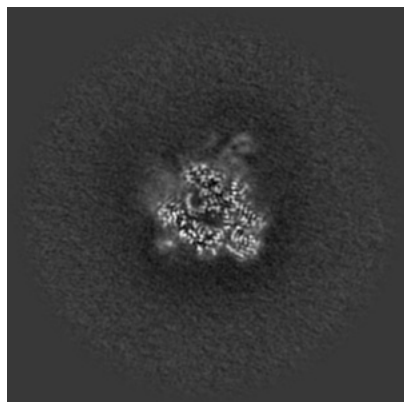
6.2.1 Primary map
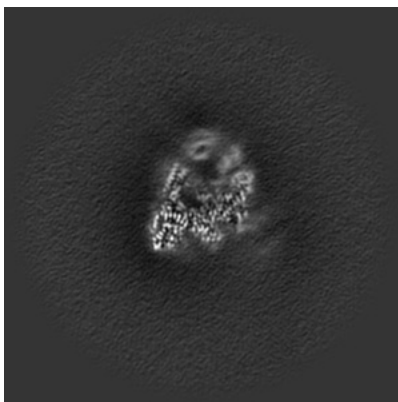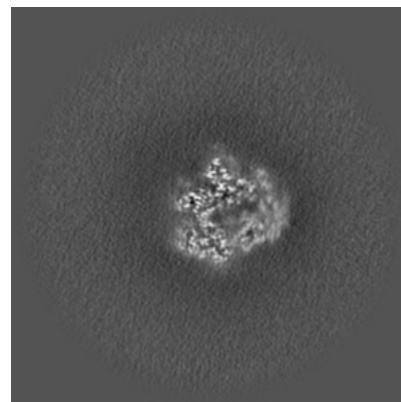
| X Index: 192 | Y Index: 192 | Z Index: 192 |

6.2.2 Raw map
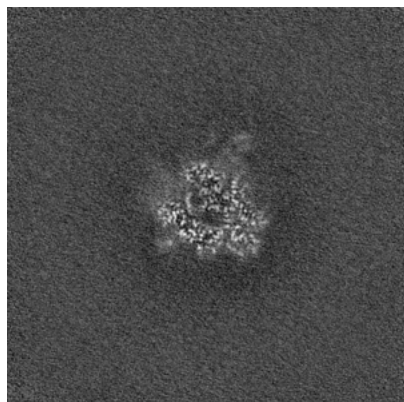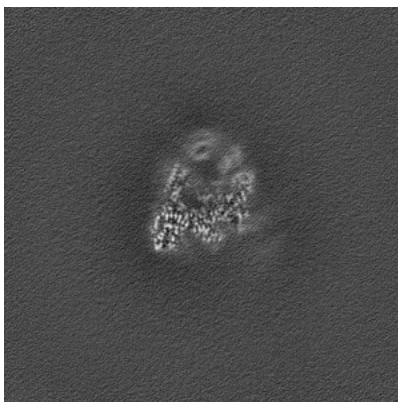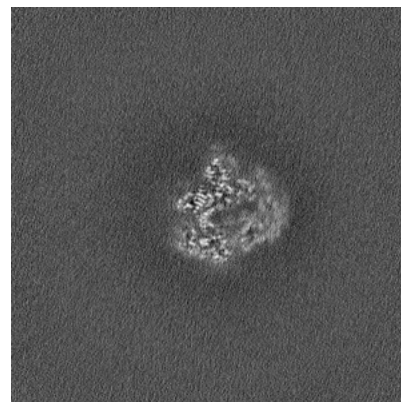
| X Index: 192 | Y Index: 192 | Z Index: 192 |

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

6.3 Largest variance slices (i)

6.3.1 Primary map
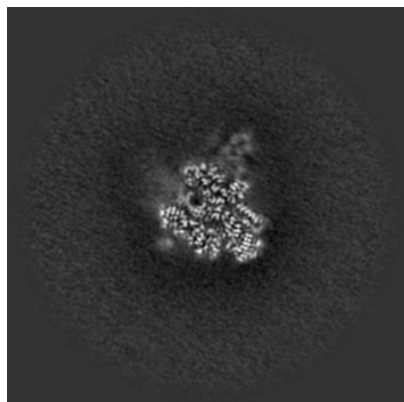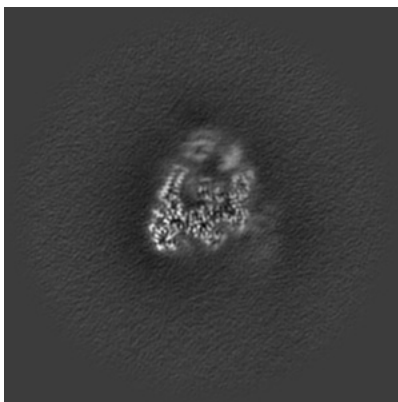
| X Index: 189 | Y Index: 195 | Z Index: 164 |
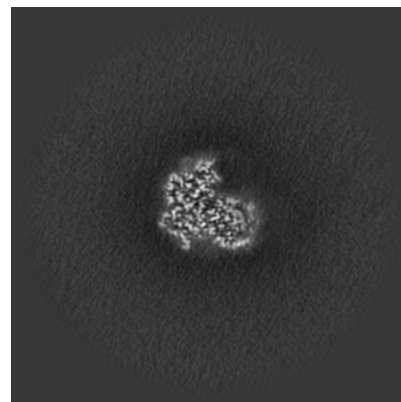
6.3.2 Raw map
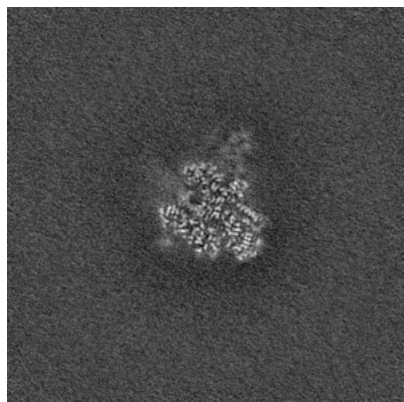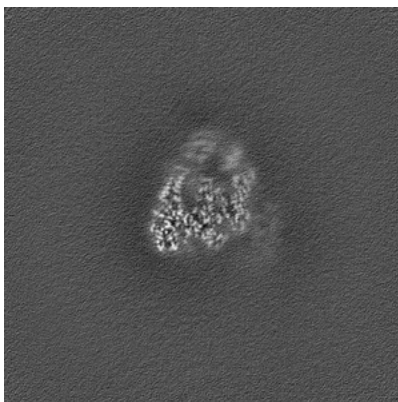
| X Index: 188 | Y Index: 196 | Z Index: 165 |
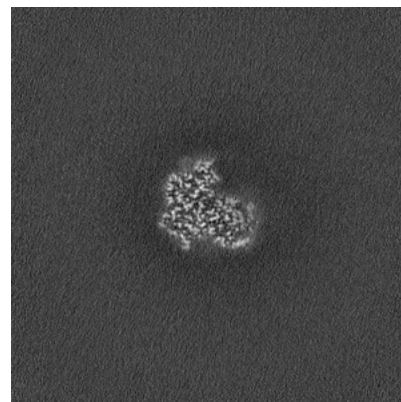
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map
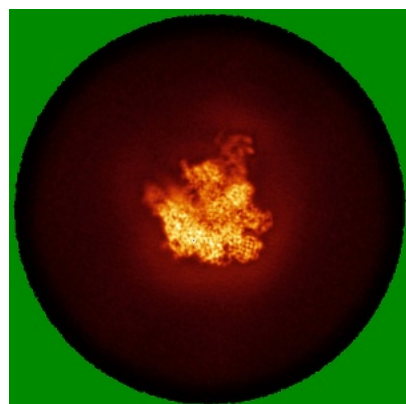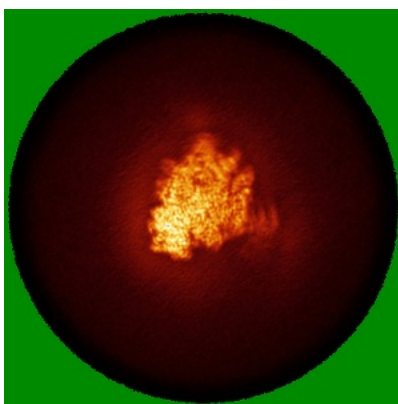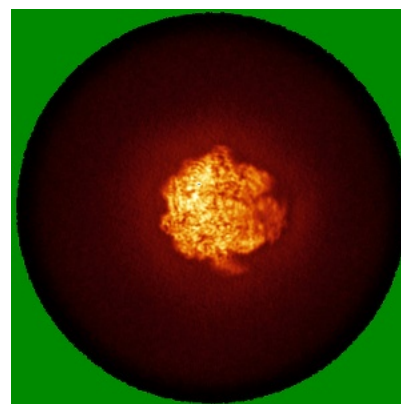
| X | Y | Z |

6.4.2 Raw map

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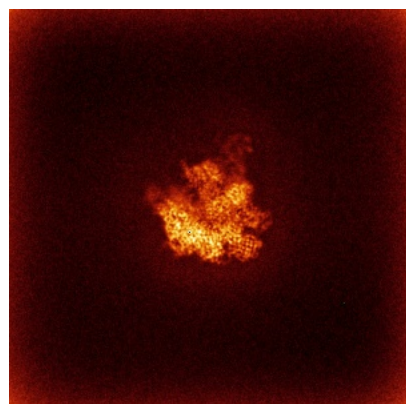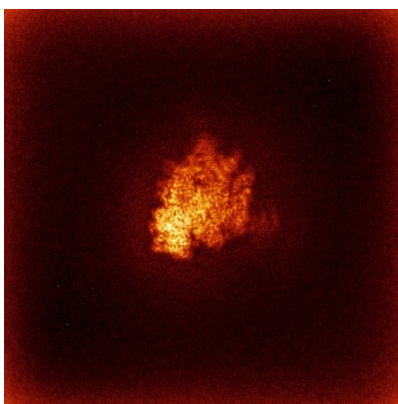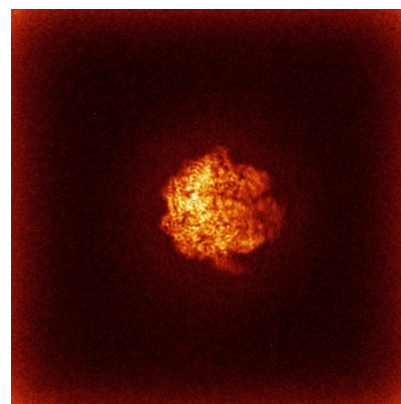
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views (i)

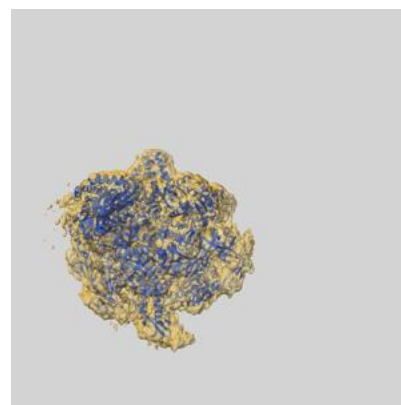### 6.5.1   Primary map
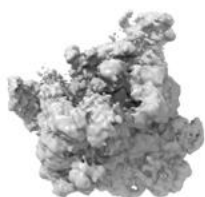
X   Y   Z

The images above show the 3D surface view of the map at the recommended contour level 0.24. 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
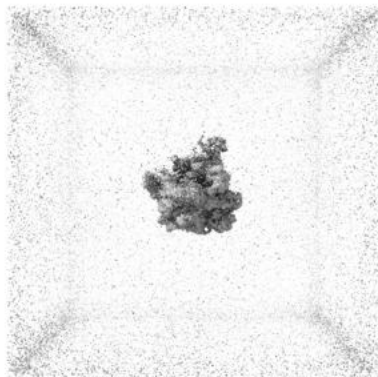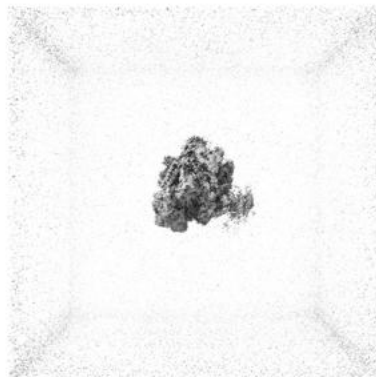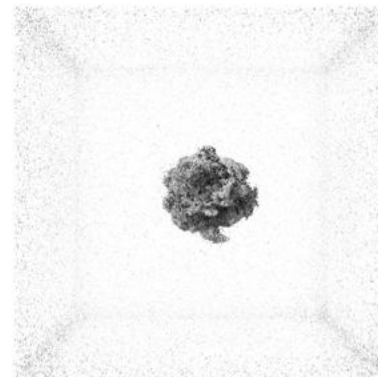
X   Y   Z

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 ⓘ

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

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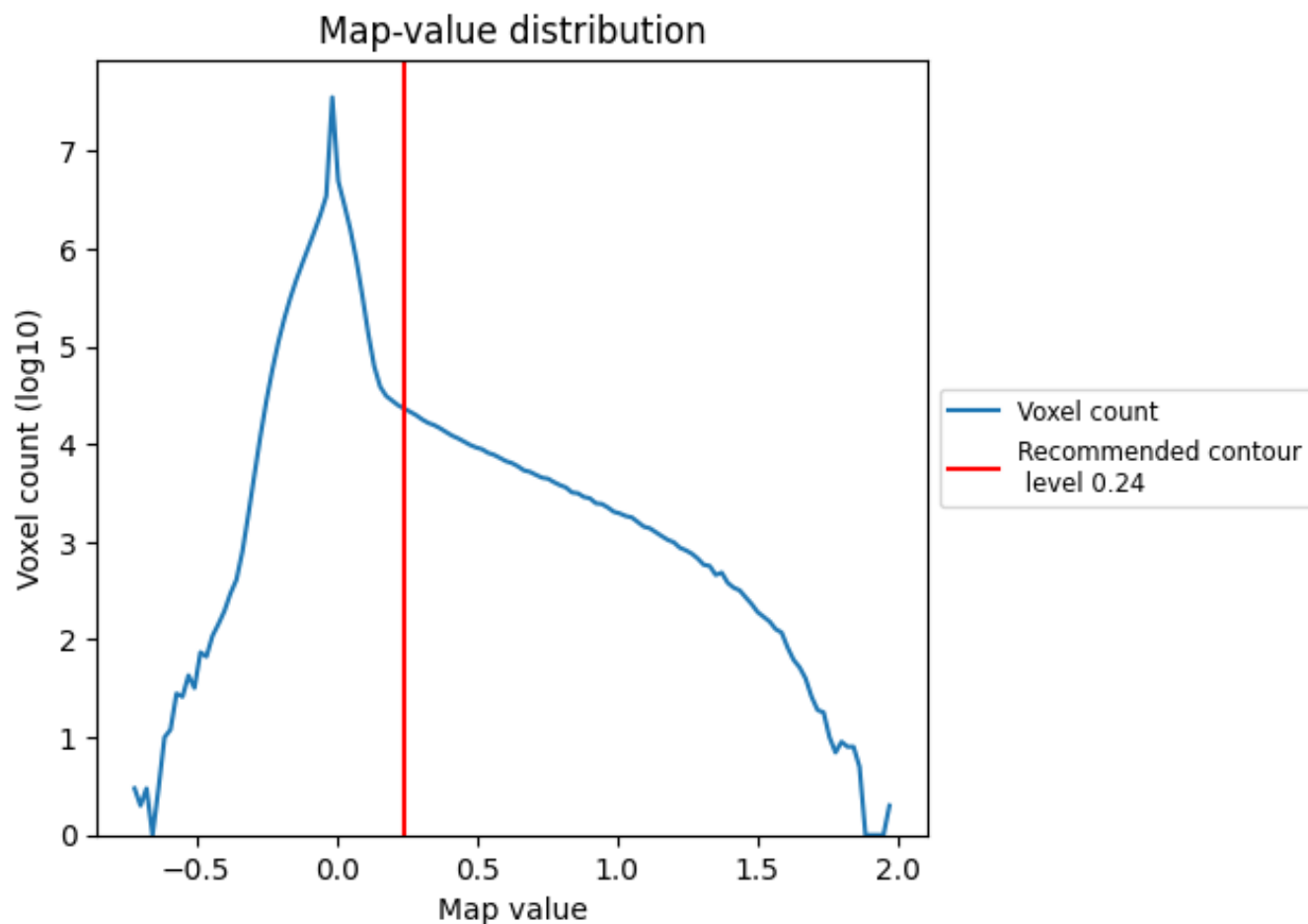
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
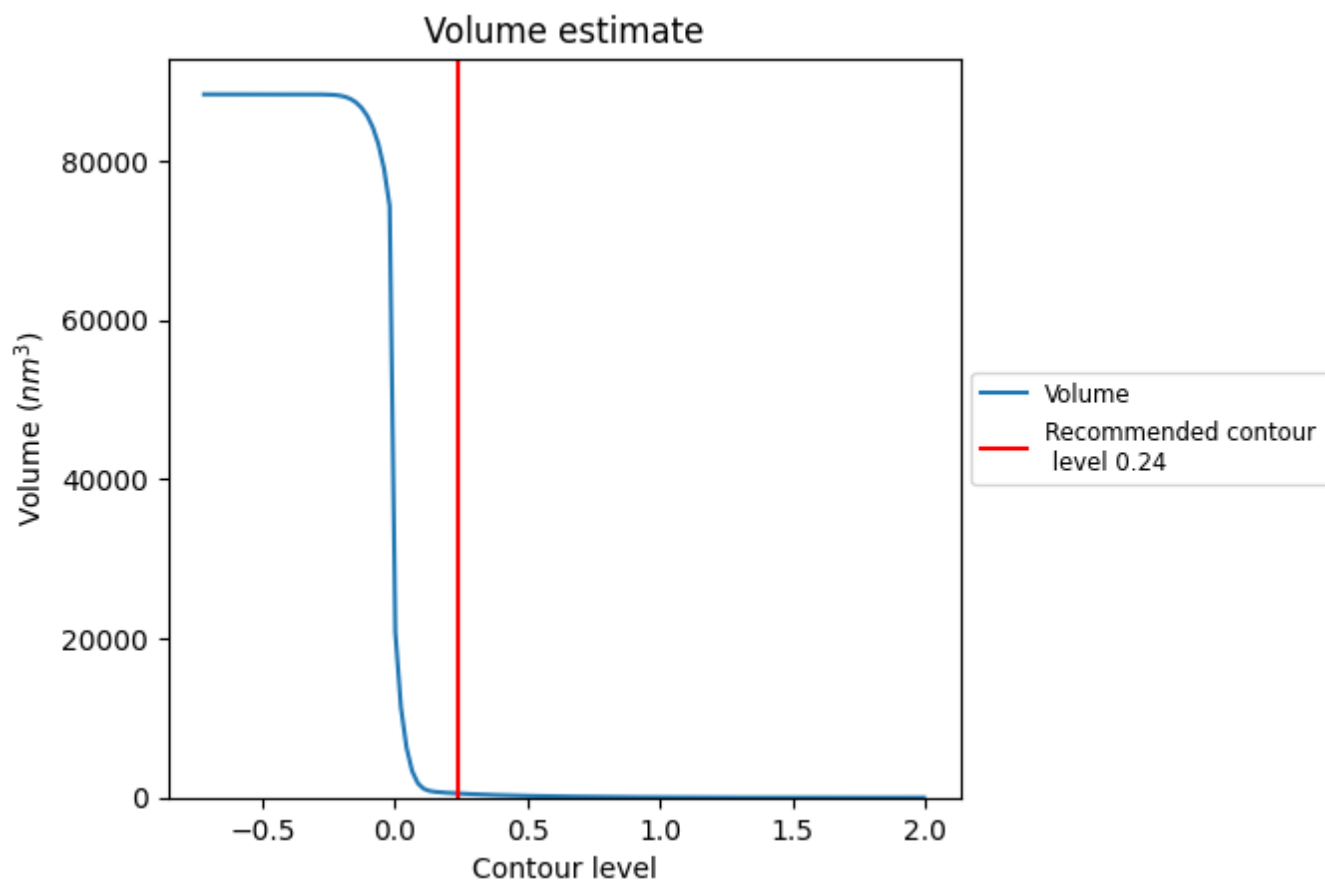
The volume at the recommended contour level is 512 nm^3; this corresponds to an approximate mass of 463 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3   Rotationally averaged power spectrum ⓘ
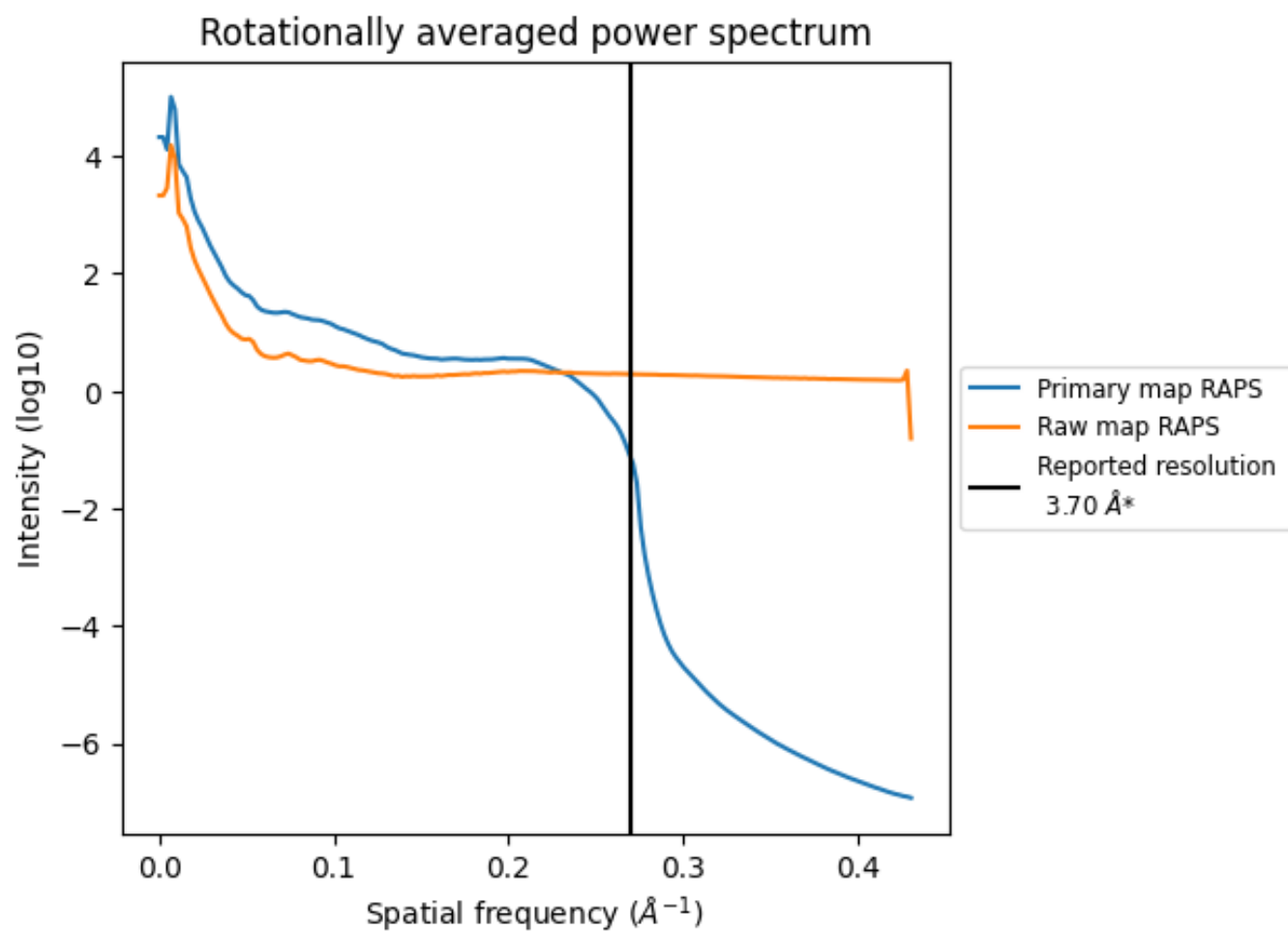
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

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)
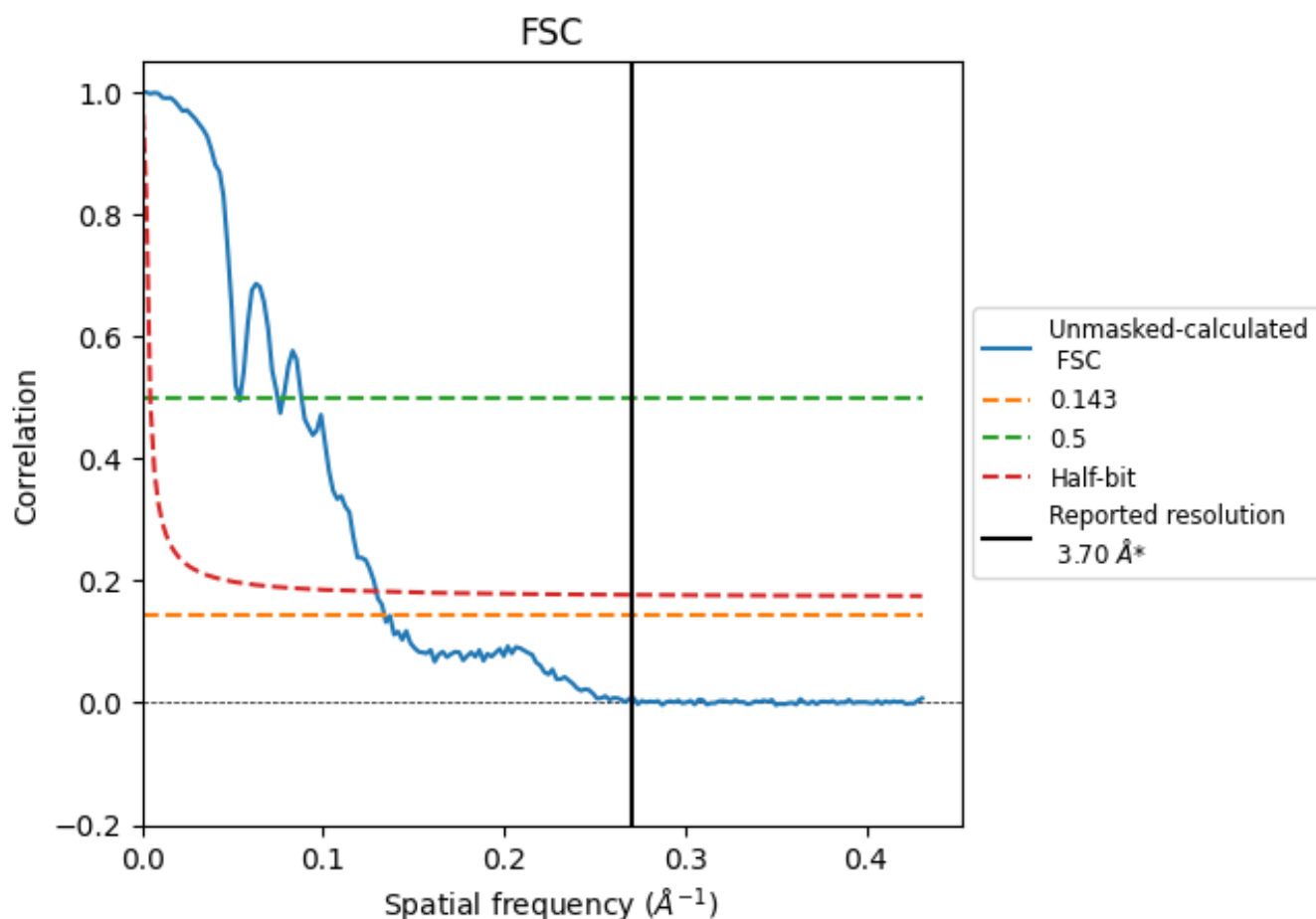
*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8.2　Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.47	18.73	7.73

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.47 differs from the reported value 3.7 by more than 10 %

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-41654 and PDB model 8TVX. Per-residue inclusion information can be found in section 3 on page 7.

9.1   Map-model overlay ⓘ
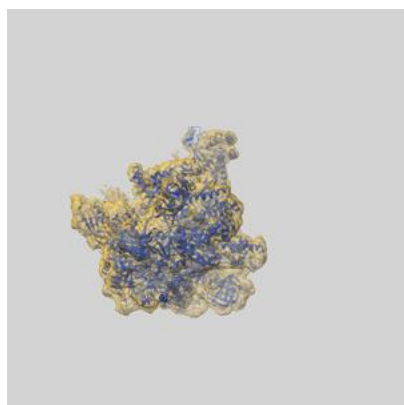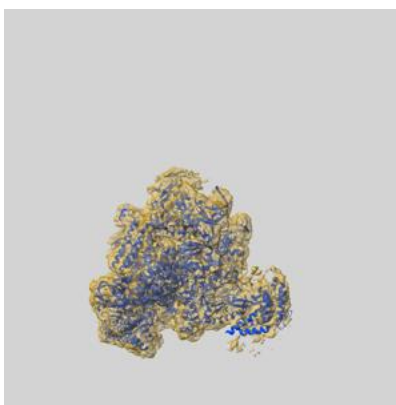
| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.24 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 ⓘ

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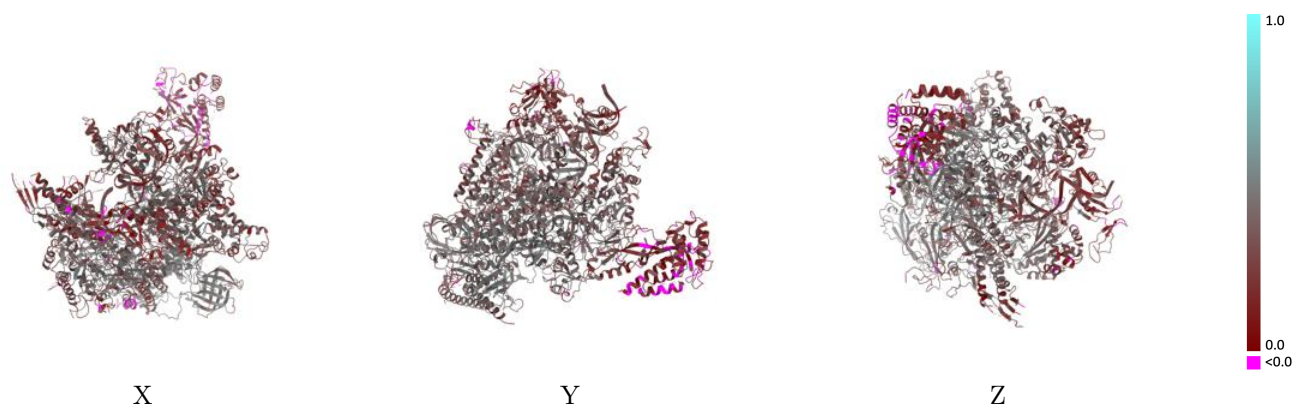
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X   Y   Z
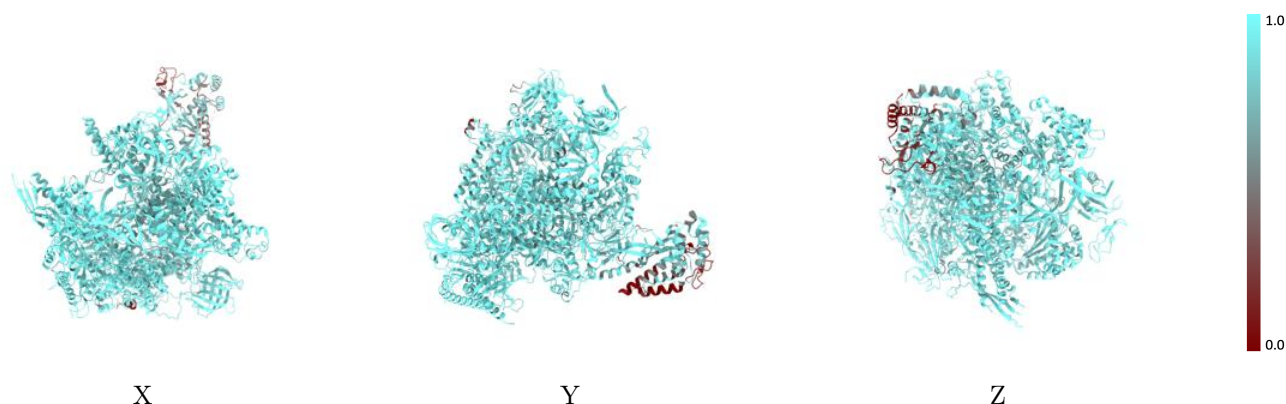
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.24).

9.4　Atom inclusion　ⓘ
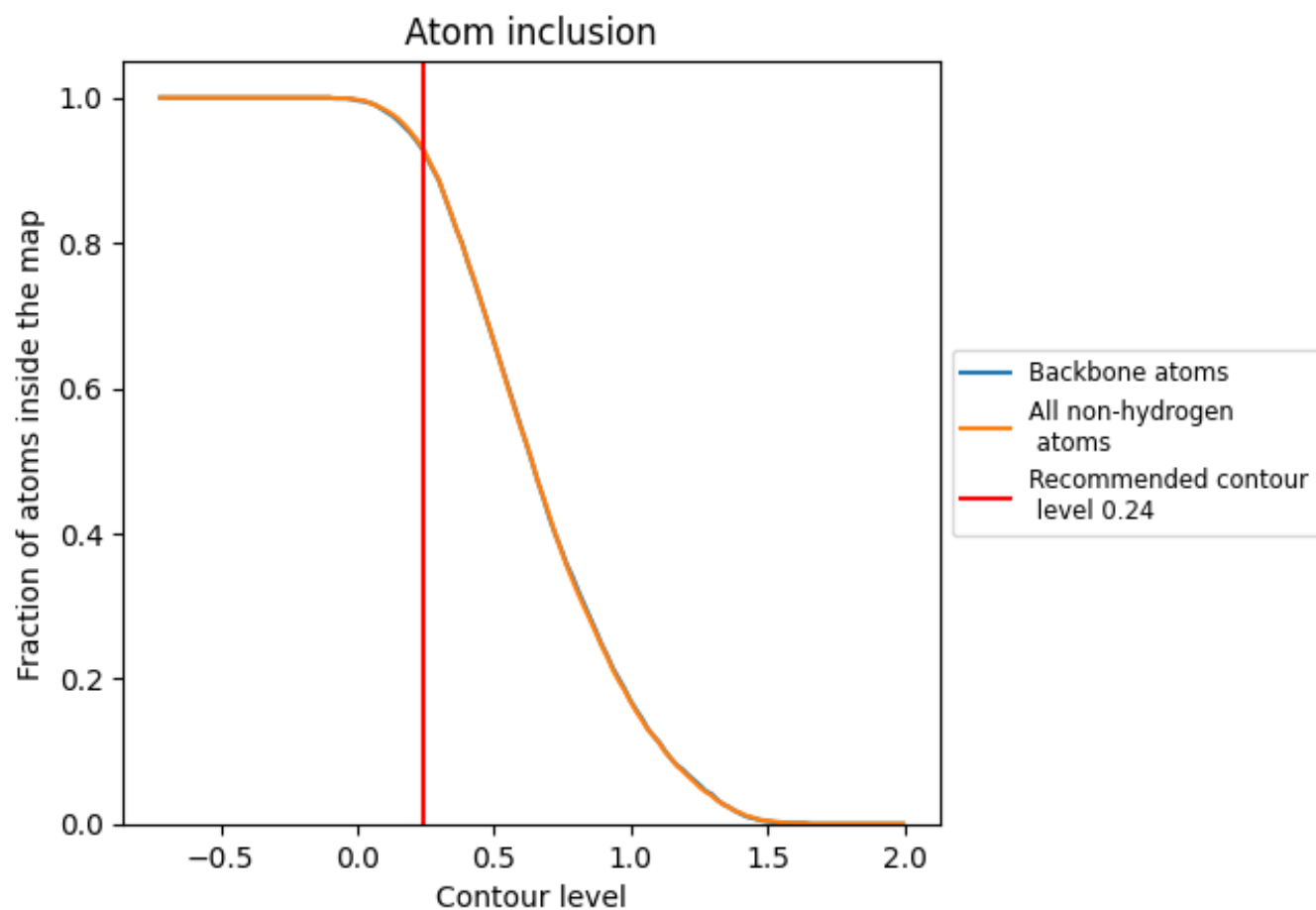
At the recommended contour level, 93% of all backbone atoms, 93% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.24) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9300	0.3590
A	0.9390	0.3710
B	0.9610	0.3830
C	0.9830	0.4330
D	0.5930	0.1340
E	0.9740	0.3330
F	0.9610	0.3950
G	0.7070	0.1950
H	0.9780	0.3890
I	0.9130	0.2690
J	0.9920	0.4260
K	0.9670	0.4110
L	0.9830	0.3320
N	0.9360	0.2310
R	0.9180	0.3460
T	0.9660	0.3270

1.0

0.0
<0.0