wwPDB EM Validation Summary Report (i)

Aug 31, 2024 – 01:03 PM EDT

PDB ID	:	8UHA
EMDB ID	:	EMD-42267
Title	:	Structure of paused transcription complex Pol II-DSIF-NELF - tilted
Authors	:	Vos, S.M.; Su, B.G.
Deposited on	:	2023-10-08
Resolution	:	3.50 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 3.50 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.
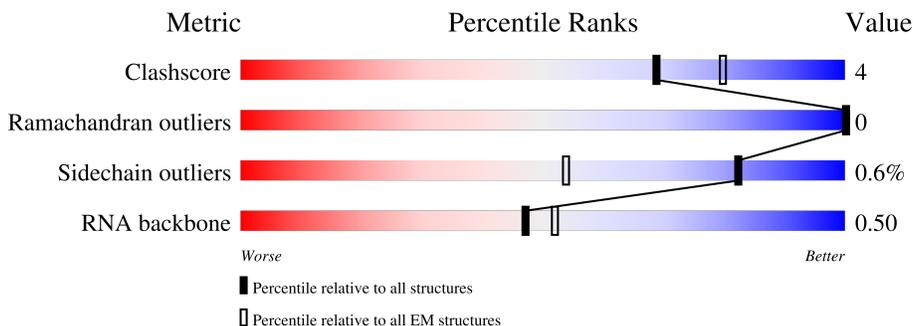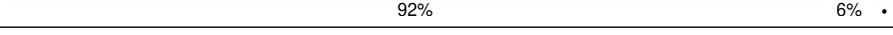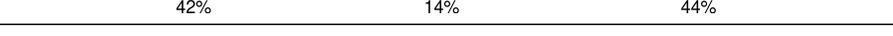

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	X	380	
2	Y	117	
3	Z	1087	
4	W	590	
5	P	17	
6	V	580	
7	A	1970	

Continued on next page...

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Mol	Chain	Length	Quality of chain
8	B	1174	87% 9%
9	C	271	86% 8% 6%
10	D	142	75% 13% 11%
11	E	210	89% 10%
12	F	127	55% 6% 39%
13	G	172	88% 11%
14	H	150	92% 7%
15	I	125	79% 12% 9%
16	J	67	84% 13%
17	K	117	92% 6%
18	L	58	66% 10% 24%
19	N	50	42% 14% 44%
20	T	50	64% 12% 24%
21	U	527	34% 63%

2 Entry composition ⓘ

There are 23 unique types of molecules in this entry. The entry contains 94681 atoms, of which 47120 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 Negative elongation factor E.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	X	12	Total 219	C 68	H 116	N 19	O 16	0	0

- Molecule 2 is a protein called Transcription elongation factor SPT4.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	Y	116	Total 1816	C 570	H 905	N 159	O 173	S 9	0	0

- Molecule 3 is a protein called Transcription elongation factor SPT5.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	Z	471	Total 7618	C 2404	H 3840	N 664	O 693	S 17	0	0

- Molecule 4 is a protein called Negative elongation factor C/D.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	W	530	Total 8438	C 2699	H 4221	N 704	O 790	S 24	0	0

- Molecule 5 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	P	15	Total 474	C 141	H 158	N 50	O 110	P 15	0	0

- Molecule 6 is a protein called Negative elongation factor B.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	V	550	Total 8911	C 2825	H 4501	N 751	O 810	S 24	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
7	A	1417	Total 22589	C 7064	H 11362	N 2008	O 2084	S 71	0	0

- Molecule 8 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	B	1136	Total 18193	C 5739	H 9117	N 1597	O 1676	S 64	0	0

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	C	255	Total 4039	C 1285	H 1995	N 349	O 404	S 6	0	0

- Molecule 10 is a protein called RNA polymerase Rpb4/RPC9 core domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	D	126	Total 2046	C 642	H 1016	N 175	O 209	S 4	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
11	E	206	Total 3414	C 1077	H 1716	N 294	O 319	S 8	0	0

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	F	77	Total 1271	C 397	H 653	N 105	O 111	S 5	0	0

- Molecule 13 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	G	171	Total 2709	C 875	H 1358	N 219	O 249	S 8	0	0

- Molecule 14 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	H	148	Total	C	H	N	O	S	0	0
			2333	750	1147	194	237	5		

- Molecule 15 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	I	114	Total	C	H	N	O	S	0	0
			1789	571	861	166	180	11		

- Molecule 16 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	J	65	Total	C	H	N	O	S	0	0
			1050	334	535	87	88	6		

- Molecule 17 is a protein called RNA polymerase II subunit J.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	K	115	Total	C	H	N	O	S	0	0
			1862	593	942	152	173	2		

- Molecule 18 is a protein called RNA polymerase II subunit K.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	L	44	Total	C	H	N	O	S	0	0
			752	231	379	72	64	6		

- Molecule 19 is a DNA chain called DNA (28-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
19	N	28	Total	C	H	N	O	P	0	0
			886	272	315	103	168	28		

- Molecule 20 is a DNA chain called DNA (38-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
20	T	38	Total	C	H	N	O	P	0	0
			1208	371	427	145	227	38		

- Molecule 21 is a protein called Negative elongation factor A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
21	U	196	3054	953	1556	253	284	8	0	0

- Molecule 22 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 23 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

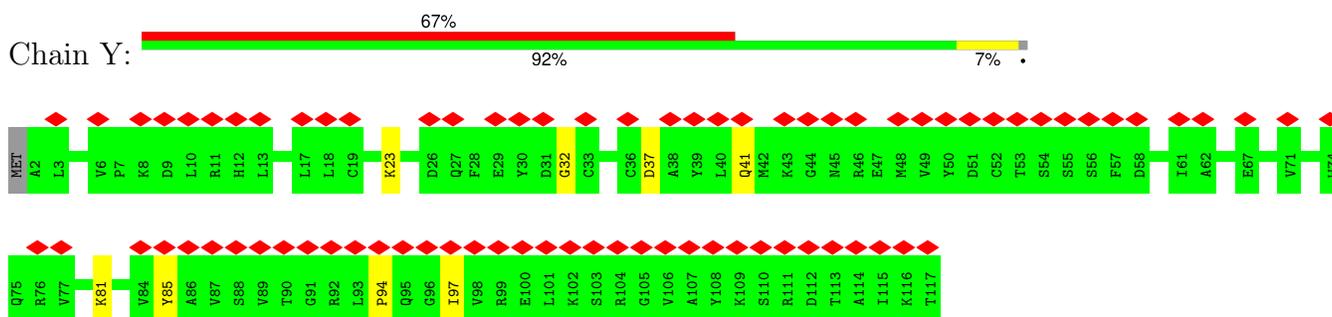| Mol	Chain	Residues	Atoms		AltConf
23	A	1	Total 1	Mg 1	0

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.
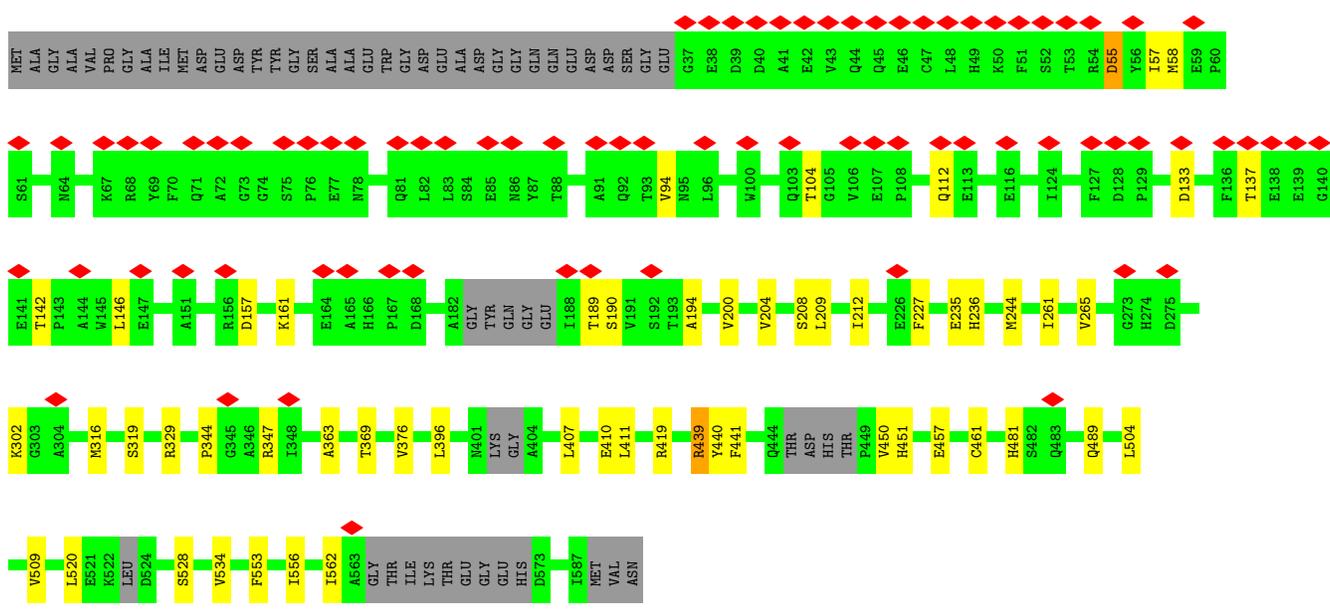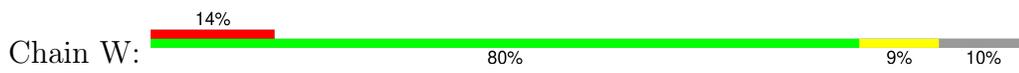
• Molecule 1: Negative elongation factor E

Chain X:

• Molecule 2: Transcription elongation factor SPT4

Chain Y:

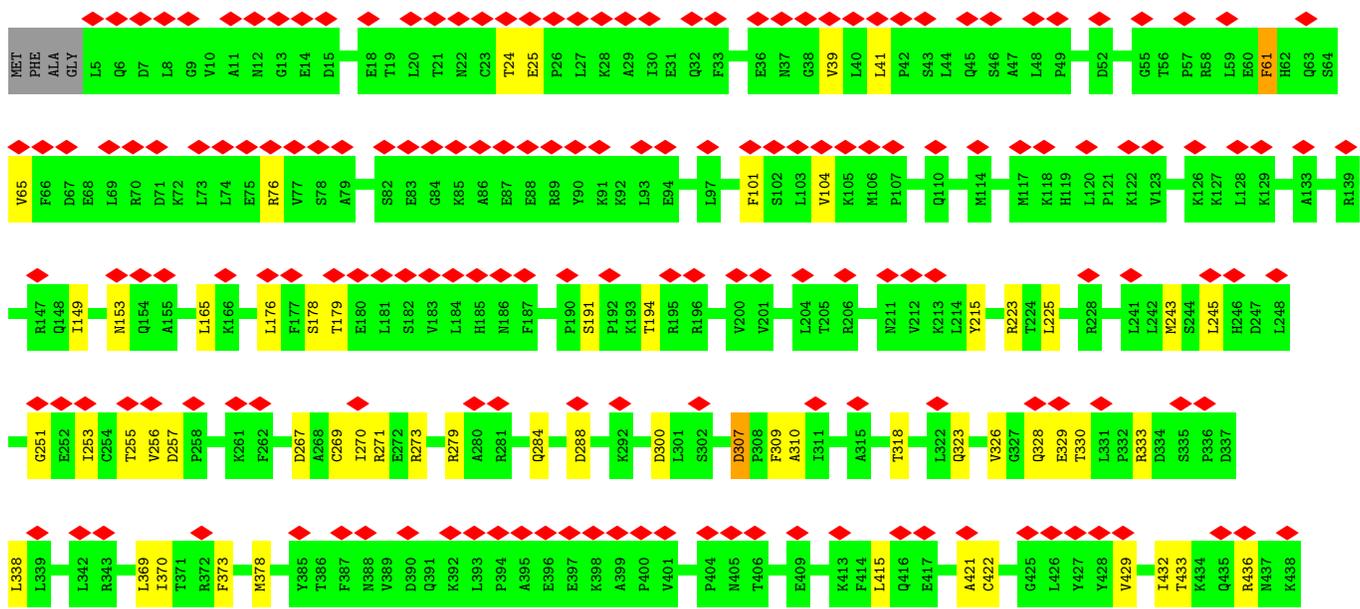• Molecule 3: Transcription elongation factor SPT5

Chain Z:

- Molecule 4: Negative elongation factor C/D

Chain W:

14%

80% 9% 10%

MET ALA GLY ALA VAL PRO GLY ALA ILE MET ASP GLU ASP TYR TYR GLY SER ALA ALA GLU TRP GLY ASP GLU ALA ASP GLY GLN GLU GLU ASP ASP SER GLY GLU G37 E38 D39 D40 A41 E42 V43 Q44 Q45 E46 C47 L48 H49 K50 F51 S52 T53 R54 D55 Y56 I57 M58 E59 P60

S61 N64 K67 R68 Y69 F70 Q71 A72 G73 G74 S75 P76 E77 N78 Q81 L82 L83 S84 E85 N86 Y87 T88 A91 Q92 T93 V94 N95 L96 W100 Q103 T104 Q105 V106 E107 P108 Q112 E113 E116 I124 F127 D128 P129 D133 F136 T137 E138 E139 G140

E141 T142 P143 A144 W145 L146 E147 A151 R156 D157 K161 E164 A165 H166 P167 D168 A182 GLY TYR GLN GLY GLU I188 T189 S190 V191 S192 T193 A194 V200 V204 S208 L209 I212 E226 F227 E235 H236 M244 I261 V265 G273 H274 D275

K302 G303 A304 M316 S319 R329 P344 G345 A346 R347 I348 A363 T369 V376 L396 N401 LYS GLY A404 L407 E410 L411 R419 R439 Y440 F441 Q444 THR ASP HIS THR P449 V450 H451 E457 C461 H481 S482 Q483 Q489 L504

V509 L520 E521 K522 LEU D524 S528 V534 F553 I556 I562 A563 GLY THR ILE LYS THR GLU GLY GLU HIS D573 I587 MET VAL ASN

- Molecule 5: RNA

Chain P:

41% 29% 12% 6% 12%

U U U3 U4 U5 U6 G7 G8 C9 A10 C17

- Molecule 6: Negative elongation factor B

Chain V:

45%

83% 11% 5%

MET PHE ALA GLY L5 Q6 D7 L8 G9 V10 A11 N12 G13 E14 D15 E18 T19 L20 T21 N22 C23 T24 E25 P26 L27 K28 A29 I30 E31 Q32 F33 E36 N37 G38 V39 L40 L41 P42 S43 L44 Q45 S46 A47 L48 P49 D52 G55 T56 P57 R58 L59 E60 F61 H62 Q63 S64

V65 F66 D67 E68 L69 R70 D71 K72 L73 L74 E75 R76 V77 S78 A79 S82 E83 G84 K85 A86 E87 E88 R89 Y90 K91 K92 L93 E94 L97 F101 S102 L103 V104 K105 M106 P107 Q110 M114 M117 K118 H119 L120 P121 K122 V123 K126 K127 L128 K129 A133 R139

R147 Q148 I149 N153 Q154 A155 L165 K166 L176 F177 S178 T179 E180 L181 S182 V183 L184 H185 N186 F187 P190 S191 P192 K193 T194 R195 R196 V200 V201 L204 T205 R206 N211 V212 K213 L214 Y215 R223 T224 L225 R228 L241 L242 M243 S244 L245 H246 D247 L248

G251 E252 I253 C254 T255 V256 D257 P258 K261 F262 D267 A268 C269 I270 R271 E272 R273 R279 A280 E281 Q284 D288 K292 D300 L301 S302 D307 P308 F309 A310 I311 A315 T318 L322 Q323 V326 G327 Q328 E329 T330 L331 P332 D334 S335 P336 D337

L338 L339 L342 R343 L369 I370 T371 R372 F373 M378 Y385 T386 F387 N388 V389 D390 Q391 K392 L393 P394 A395 E396 E397 K398 A399 P400 V401 P404 N405 T406 E409 K413 F414 L415 Q416 E417 A421 C422 G425 L426 Y427 Y428 V429 I432 T433 K434 Q435 R436 N437 K438

• Molecule 7: DNA-directed RNA polymerase subunit

Chain A:

SER PRO SER TYR SER PRO SER SER PRO GLU TYR THR PRO THR SER PRO LYS TYR SER PRO THR SER PRO LYS TYR SER PRO THR SER PRO LYS TYR SER PRO THR SER PRO THR SER PRO THR PRO LYS TYR SER PRO THR SER PRO THR TYR SER PRO THR SER PRO VAL TYR

THR PRO THR SER PRO LYS TYR SER PRO SER PRO TYR SER PRO THR SER PRO THR TYR LYS TYR SER PRO THR SER PRO THR TYR SER PRO THR SER PRO LYS GLY TYR THR PRO THR SER PRO THR PRO GLY TYR SER PRO THR SER PRO THR TYR SER LEU THR SER PRO ALA ILE SER

PRO ASP ASP SER ASP GLU GLU ASN

• Molecule 8: DNA-directed RNA polymerase subunit beta

Chain B: 87%   9%   •

MET TYR ASP ALA ASP GLU ASP MET GLN TYR ASP GLU ASP ASP D15 D48 I65 A69 GLU ALA GLN HIS ALA SER GLY GLU VAL GLU GLU P81 L118 T119 Y125 I133 E138 S158 T159 Y160 I187 N188 G189 V237 Q245 Q254 R274 D281

L285 I289 F309 Q312 V369 G378 R379 R380 E381 Y388 L412 N503 S536 S539 T565 P580 N585 R588 K589 L590 M594 I607 R610 T616 I621 L643 L656 E663 H695 H741 D745 V759 T760

T761 M764 E771 A783 V794 I795 M796 R803 V809 S813 Q825 R841 G852 P856 S861 G862 D863 G868 K869 T870 V871 T872 L873 P874 GLU ASN GLU GLU LEU GLU GLY THR ASN ARG TYR T888 K889 V904 D905 Q906 N912 Y916

K917 F918 I921 R922 R927 Q948 D953 D964 I967 N992 A999 T1000 V1008 L1028 Q1040 I1041 K1052 V1055 D1056 D1057 Q1068 Q1073 E1076 G1077 R1078 S1079 R1080 R1091 Q1094 L1103 R1104 E1105 R1106 L1107 S1111 D1112 R1131 C1137

R1138 G1139 N1142 L1158 L1162 I1167 R1170 S1173 V1174

• Molecule 9: DNA-directed RNA polymerase II subunit RPB3

Chain C: 86%   8%   6%

MET P2 P7 T8 V9 R10 E24 R36 I45 W49 V50 I78 E92 R113 H114 V127 S132 ARG ASN ARG ASP ASN ASP PRO SER ASP TYR VAL GLU GLN D146 R154 A165 A183 R193 V196 A218 P222 N232 V233 E234

Q260 S269 ASP VAL

• Molecule 10: RNA polymerase Rpb4/RPC9 core domain-containing protein

Chain D: 75%   13%   11%

MET ALA ALA GLY GLY SER ASP PRO ARG ALA GLY ASP VAL E14 E27 T28 T31 L32 L33 V37 Q55 S58 E59 T68 S72 K75 N76 T79 L87 F95 E96 L97 A101 E110 L114 R121 S139 PHE GLN TYR

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

Chain E: 89%   10%   •

MET D2 F44 GLY ASP K47 G51 ARG P53 R54 D67 G83 T86 C91 Q92 R93 E97 Q108 L118 L127 E134 V156 L160 A161 R162 A180 R181 G184 V190 I193 Q210

• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F: 55%   6%   39%

MET SER ASP ASN GLU ASP ASN PHE ASP GLY ASP ASP PHE ASP ASP VAL GLU GLU ASP GLU GLY LEU ASP ASP LEU GLU ASN ALA GLU GLU GLU GLY GLN GLU ASN VAL GLU ILE LEU PRO SER GLY GLU ARG PRO GLN ALA ASN GLN K50 R51 I52 T53 L66 L97 R100

E116 L123 S126 ASP

• Molecule 13: DNA-directed RNA polymerase II subunit RPB7

Chain G: 88%   11% •

M1 F2 Y17 N21 T25 Q28 K29 L30 F31 T32 E33 V34 V84 C106 F107 I108 I113 M117 T130 M131 D132 R144 L145 G161 V171 SER

• Molecule 14: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H: 92%   7% •

MET A2 K20 S26 R27 L28 E33 V50 T63 R84 A85 V91 R124 A149 PHE

• Molecule 15: DNA-directed RNA polymerase II subunit RPB9

Chain I: 79%   12%   9%

MET GLU PRO ASP GLY THR TYR GLU PRO GLY PHE V12 C39 R40 I68 I69 V72 D75 P79 C86 Q87 A102 E105 M108 R109 R122 W123 T124 E125

• Molecule 16: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J: 84%   13% •

M1 F8 T9 E19 R42 R46 R47 M48 Y62 L65 GLU LYS

• Molecule 17: RNA polymerase II subunit J

Chain K: 92%   6% •

M1 L12 K18 I71 I91 R104 F105 I109 G115 ILE GLU

• Molecule 18: RNA polymerase II subunit K

Chain L:

66%　　　　　　10%　　　　　24%

MET ASP THR GLN LYS ASP VAL GLN PRO PRO LYS GLN GLN PRO M15 N26 D32 R35 C36 R37 V54 F55 R58

• Molecule 19: DNA (28-MER)

Chain N:

42%　　　　　14%　　　　　44%

DG DG DT DC A5 G6 C12 C13 G14 DC DC DA DT DA DG DT DT DG DC G25 C26 C27 T35 C36 A37 G38 T42 DT DC DC DA DG DT DG DG

• Molecule 20: DNA (38-MER)

Chain T:

64%　　　　　12%　　　　　24%

DC DC DA DC DT DG DG DA A9 T14 G23 G24 C37 G38 A44 C45 T46 DG DA DC DC

• Molecule 21: Negative elongation factor A

Chain U:

34%　　　　　　　63%

MET ALA SER MET ARG GLU SER ASP T9 W12 L13 H14 G18 A19 T20 D21 E22 P27 L32 L54 K55 H62 M76 L84 W89 D102 T103 V117 I120 L124 E130 A133 S134 A135 R175 L179 A186 Q187 Q188 UNK UNK UNK

UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK

G253 L262 G268 ARG GLU ALA LYS ARG ARG ARG LYS THR LEU ASP SER ALA GLU VAL VAL GLU LYS PRO ALA LYS SER GLU GLU THR PRO PRO ASP TYR ALA ALA GLY LEU VAL SER THR GLN LEU LYS SER GLU ASN ALA GLU PRO ALA LEU PRO SER THR

TYR LEU PRO SER PRO SER VAL VAL PRO ALA SER SER TYR ILE PRO SER GLU THR PRO PRO ALA PRO SER SER ARG GLU ALA SER ARG PRO GLU GLU PRO SER ALA PRO SER THR LEU PRO ALA GLN PHE LYS GLN ARG ALA PRO MET TYR ASN SER GLY LEU SER PRO

ALA THR PRO THR PRO ALA ALA PRO THR SER PRO LEU THR PRO THR PRO ALA VAL ALA PRO THR GLN THR PRO PRO VAL ALA MET VAL ALA PRO GLN THR GLN ALA PRO GLN GLN PRO LYS LYS ASN LEU SER LEU THR ARG GLU GLN MET PHE ALA ALA GLN GLU

MET PHE LYS THR ALA ASN LYS VAL THR ARG PRO GLU LYS ALA LEU ILE LEU GLY PHE MET ALA GLY SER ARG GLU GLU ASN PRO CYS GLN GLU GLN GLY ASP VAL ILE GLN ILE LYS LEU SER GLU HIS THR GLU ASP LEU PRO LYS LYS ASN LEU SER LEU THR ARG GLU GLN MET PHE ALA ALA GLN GLU

THR VAL PHE GLU MET ASN TYR ALA THR GLY GLN TRP THR ARG PHE LYS LYS TYR LYS PRO MET THR ASN VAL SER

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	9428	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 $(e^-/\text{Å}^2)$	51	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.608	Depositor
Minimum map value	-1.238	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.097	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	420.864, 420.864, 420.864	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.822, 0.822, 0.822	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	X	0.53	0/103	0.79	1/132 (0.8%)
2	Y	0.25	0/927	0.57	0/1250
3	Z	0.27	0/3841	0.59	0/5167
4	W	0.29	0/4302	0.55	0/5835
5	P	0.32	0/351	1.07	2/544 (0.4%)
6	V	0.31	0/4495	0.60	0/6074
7	A	0.28	0/11431	0.61	0/15432
8	B	0.28	0/9257	0.61	0/12493
9	C	0.27	0/2087	0.58	0/2836
10	D	0.31	0/1043	0.60	0/1400
11	E	0.29	0/1727	0.61	0/2329
12	F	0.28	0/628	0.63	0/848
13	G	0.30	0/1382	0.58	0/1874
14	H	0.28	0/1207	0.62	0/1628
15	I	0.29	0/949	0.61	0/1284
16	J	0.30	0/524	0.59	0/707
17	K	0.28	0/939	0.51	0/1271
18	L	0.28	0/378	0.75	0/500
19	N	0.94	0/638	1.16	2/979 (0.2%)
20	T	0.83	1/876 (0.1%)	1.05	0/1350
21	U	0.29	0/1521	0.56	0/2063
All	All	0.32	1/48606 (0.0%)	0.63	5/65996 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
20	T	37	DC	C1'-N1	6.33	1.57	1.49

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	P	6	U	P-O3'-C3'	5.94	126.83	119.70
19	N	38	DG	O4'-C1'-N9	5.53	111.87	108.00
5	P	17	C	C2-N1-C1'	5.32	124.65	118.80
19	N	35	DT	O4'-C4'-C3'	-5.29	102.38	104.50
1	X	15	LEU	CB-CG-CD2	5.09	119.65	111.00

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	X	103	116	120	0	0
2	Y	911	905	905	4	0
3	Z	3778	3840	3840	23	0
4	W	4217	4221	4221	37	0
5	P	316	158	158	5	0
6	V	4410	4501	4501	42	0
7	A	11227	11362	11361	98	0
8	B	9076	9117	9117	71	0
9	C	2044	1995	1995	19	0
10	D	1030	1016	1016	12	0
11	E	1698	1716	1716	11	0
12	F	618	653	653	4	0
13	G	1351	1358	1358	12	0
14	H	1186	1147	1147	6	0
15	I	928	861	860	10	0
16	J	515	535	535	8	0
17	K	920	942	942	6	0
18	L	373	379	379	4	0
19	N	571	315	317	5	0
20	T	781	427	428	5	0
21	U	1498	1556	1556	14	0
22	A	2	0	0	0	0
22	B	1	0	0	0	0
22	C	1	0	0	0	0
22	I	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
22	J	1	0	0	0	0
22	L	1	0	0	0	0
22	Y	1	0	0	0	0
23	A	1	0	0	0	0
All	All	47561	47120	47125	331	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

The worst 5 of 331 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)
21:U:120:ILE:HG23	21:U:124:LEU:HD12	1.64	0.80
7:A:567:LEU:HD13	7:A:595:ILE:HG22	1.68	0.75
8:B:585:ASN:OD1	8:B:588:ARG:NH2	2.23	0.71
3:Z:199:LYS:NZ	3:Z:240:GLU:O	2.23	0.71
7:A:1262:MET:SD	7:A:1264:SER:OG	2.49	0.71

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	X	10/380 (3%)	10 (100%)	0	0	100	100
2	Y	114/117 (97%)	113 (99%)	1 (1%)	0	100	100
3	Z	455/1087 (42%)	434 (95%)	21 (5%)	0	100	100
4	W	518/590 (88%)	504 (97%)	14 (3%)	0	100	100
6	V	548/580 (94%)	536 (98%)	12 (2%)	0	100	100
7	A	1407/1970 (71%)	1355 (96%)	52 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
8	B	1130/1174 (96%)	1071 (95%)	59 (5%)	0	100	100
9	C	251/271 (93%)	244 (97%)	7 (3%)	0	100	100
10	D	124/142 (87%)	118 (95%)	6 (5%)	0	100	100
11	E	200/210 (95%)	194 (97%)	6 (3%)	0	100	100
12	F	75/127 (59%)	74 (99%)	1 (1%)	0	100	100
13	G	169/172 (98%)	167 (99%)	2 (1%)	0	100	100
14	H	146/150 (97%)	142 (97%)	4 (3%)	0	100	100
15	I	112/125 (90%)	106 (95%)	6 (5%)	0	100	100
16	J	63/67 (94%)	60 (95%)	3 (5%)	0	100	100
17	K	113/117 (97%)	108 (96%)	5 (4%)	0	100	100
18	L	42/58 (72%)	42 (100%)	0	0	100	100
21	U	192/527 (36%)	181 (94%)	11 (6%)	0	100	100
All	All	5669/7864 (72%)	5459 (96%)	210 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	X	11/331 (3%)	10 (91%)	1 (9%)	7	30
2	Y	102/103 (99%)	102 (100%)	0	100	100
3	Z	418/940 (44%)	417 (100%)	1 (0%)	92	97
4	W	471/513 (92%)	465 (99%)	6 (1%)	65	81
6	V	493/515 (96%)	487 (99%)	6 (1%)	67	82
7	A	1248/1749 (71%)	1243 (100%)	5 (0%)	89	95
8	B	994/1027 (97%)	988 (99%)	6 (1%)	84	91
9	C	232/248 (94%)	232 (100%)	0	100	100
10	D	116/126 (92%)	116 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
11	E	189/192 (98%)	187 (99%)	2 (1%)	70	83
12	F	67/111 (60%)	67 (100%)	0	100	100
13	G	152/153 (99%)	152 (100%)	0	100	100
14	H	129/131 (98%)	129 (100%)	0	100	100
15	I	103/112 (92%)	103 (100%)	0	100	100
16	J	54/56 (96%)	54 (100%)	0	100	100
17	K	104/106 (98%)	103 (99%)	1 (1%)	73	84
18	L	41/55 (74%)	40 (98%)	1 (2%)	44	68
21	U	167/396 (42%)	166 (99%)	1 (1%)	84	91
All	All	5091/6864 (74%)	5061 (99%)	30 (1%)	82	91

5 of 30 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
7	A	325	LEU
17	K	71	ILE
7	A	1199	MET
21	U	76	MET
8	B	1142	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
5	P	14/17 (82%)	5 (35%)	1 (7%)

All (5) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
5	P	4	U
5	P	5	U
5	P	7	G
5	P	8	G
5	P	10	A

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
5	P	6	U

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 10 ligands modelled in this entry, 10 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-42267. 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 ⓘ
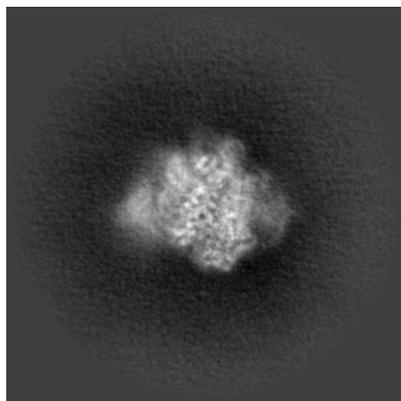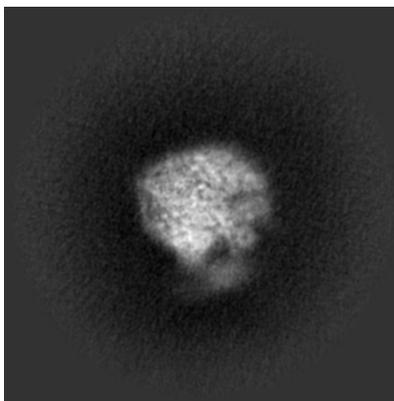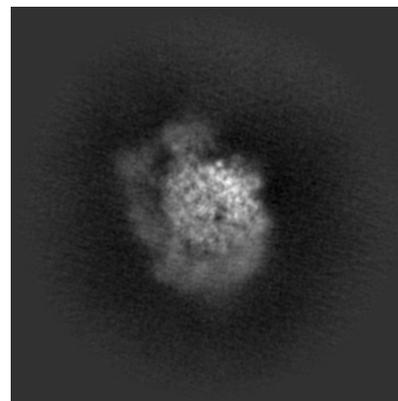
6.1.1   Primary map

X   Y   Z

6.1.2   Raw map

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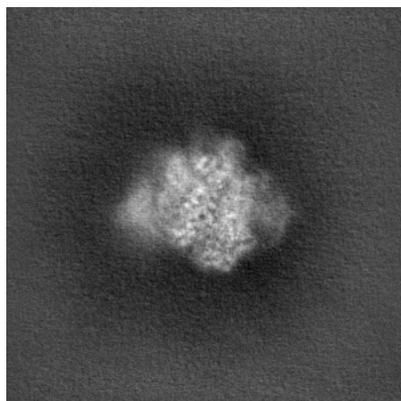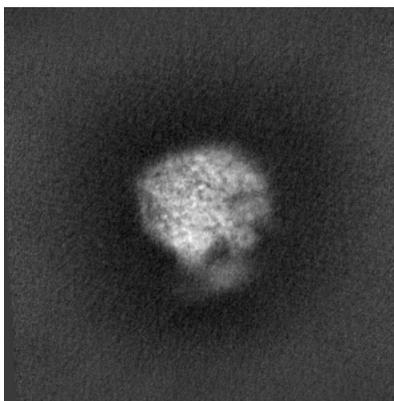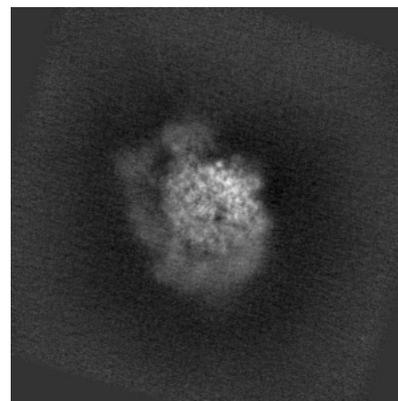
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
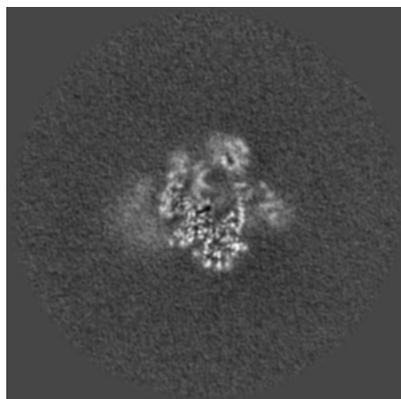
6.2.1   Primary map
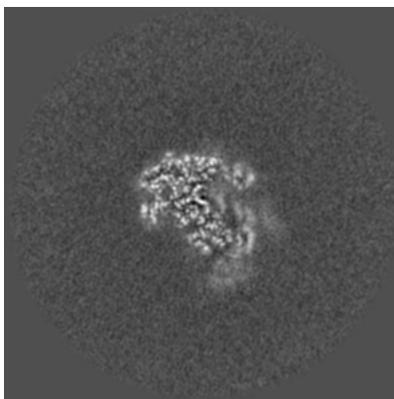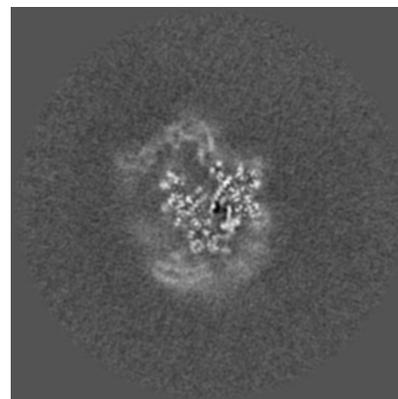
X Index: 256   Y Index: 256   Z Index: 256

6.2.2   Raw map
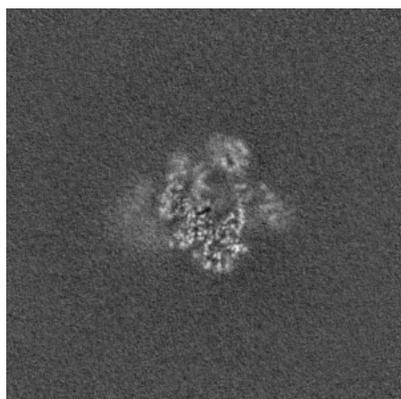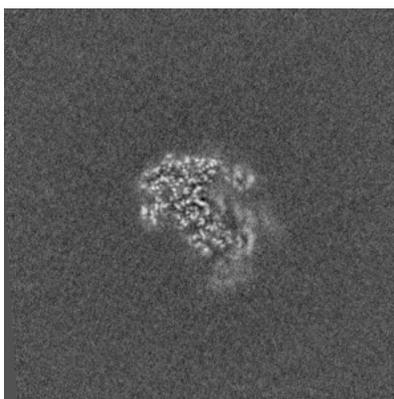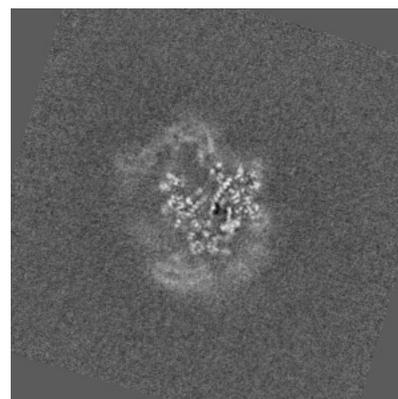
X Index: 256   Y Index: 256   Z Index: 256

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
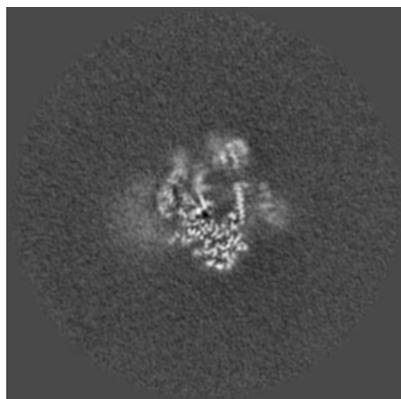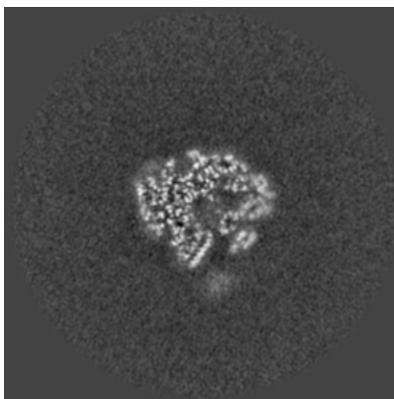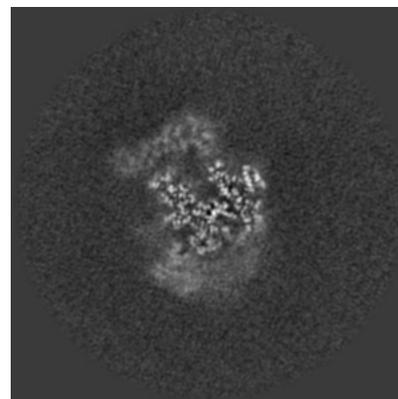
| X Index: 259 | Y Index: 282 | Z Index: 246 |

6.3.2 Raw map
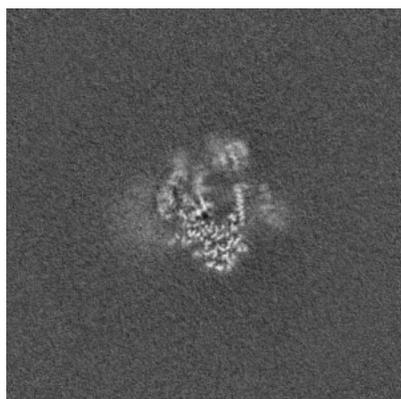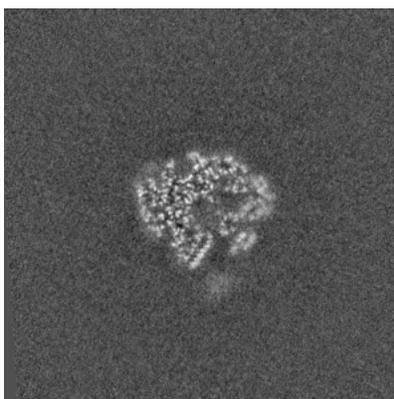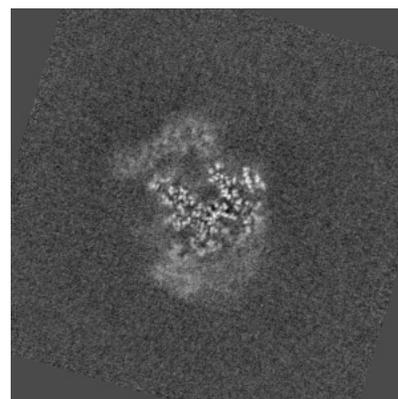
| X Index: 259 | Y Index: 282 | Z Index: 245 |

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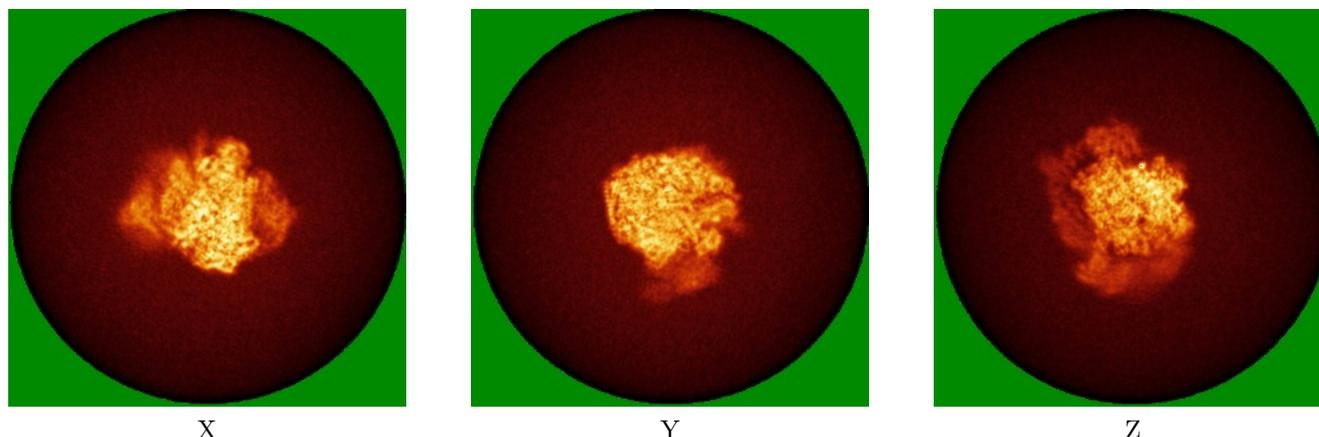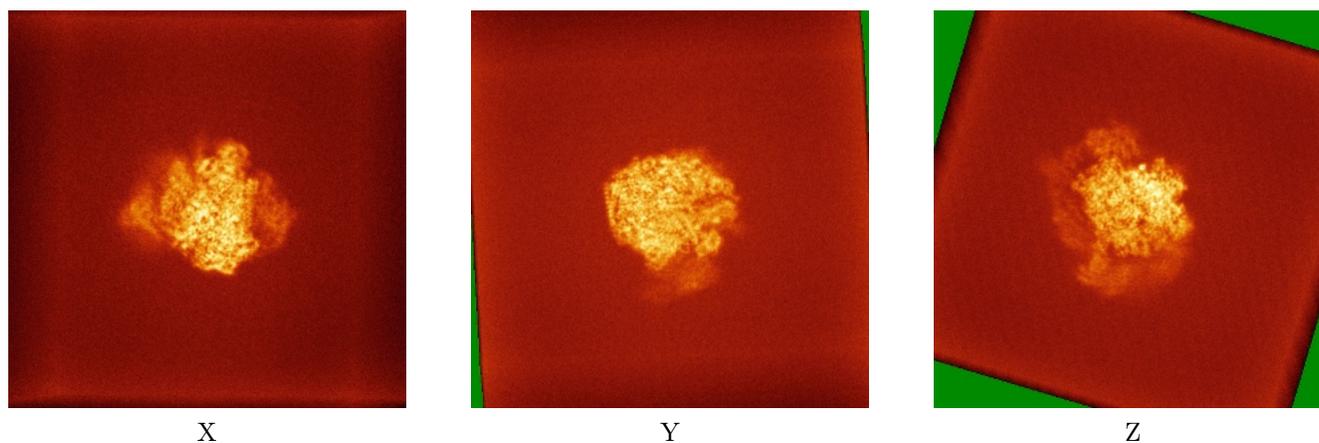
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |
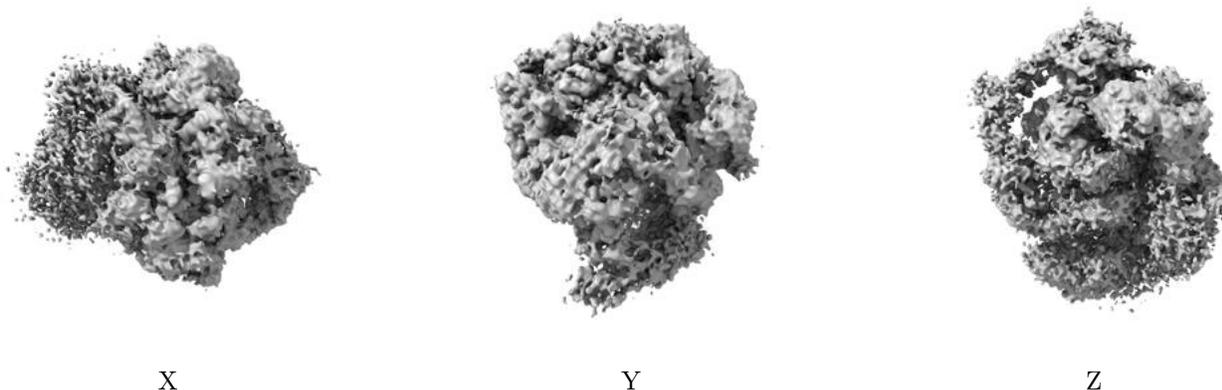
The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

| X | Y | Z |
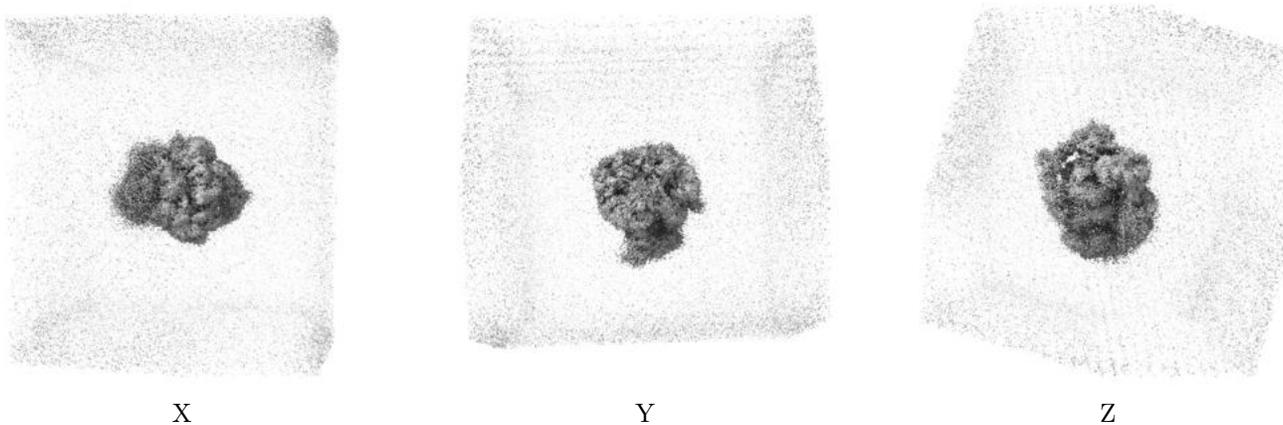
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6   Mask visualisation (i)

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

A mask typically either:

- Encompasses the whole structure

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

6.6.1   emd_42267_msk_1.map (i)

X   Y   Z
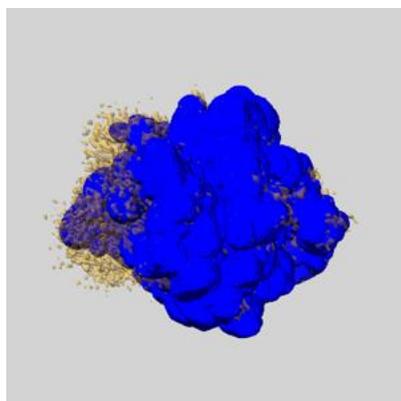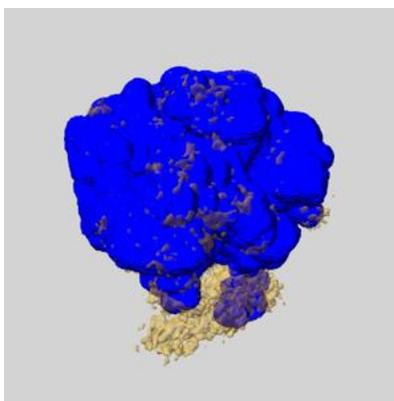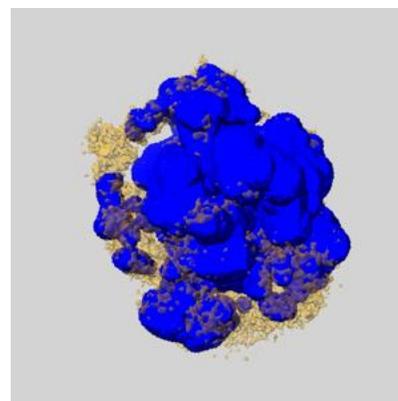
7 Map analysis ⓘ

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

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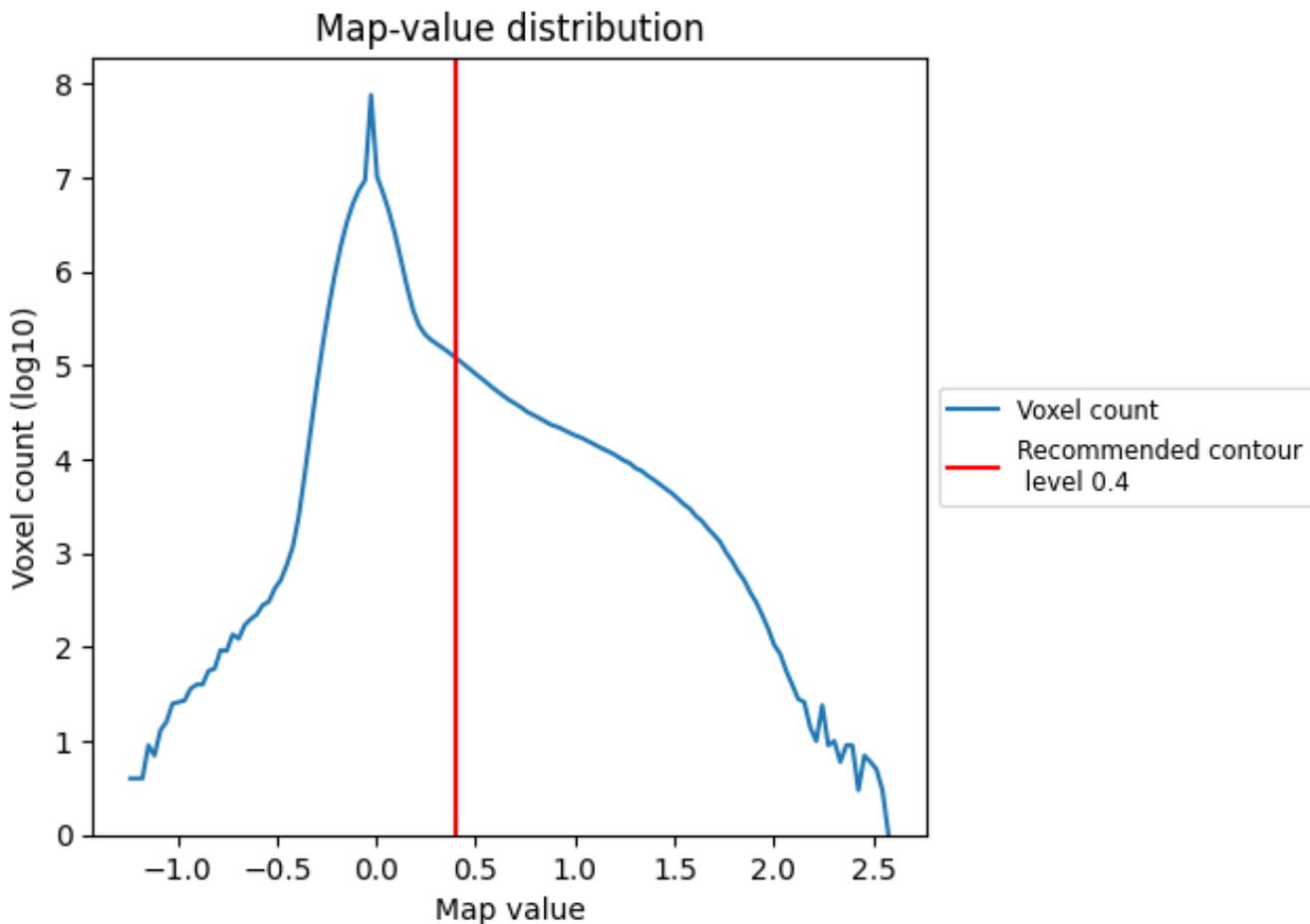
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
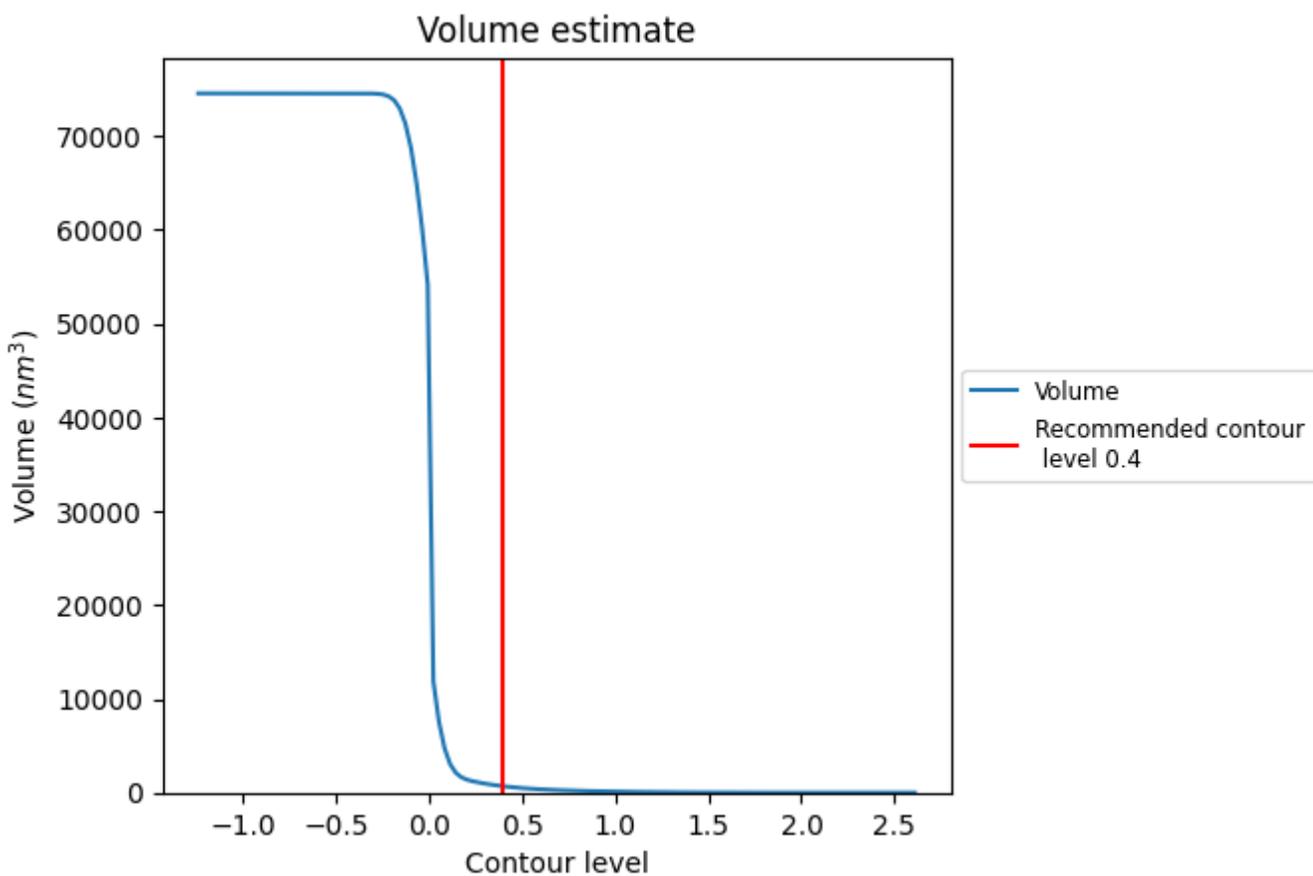
The volume at the recommended contour level is 680 nm^3; this corresponds to an approximate mass of 615 kDa.

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 ⓘ
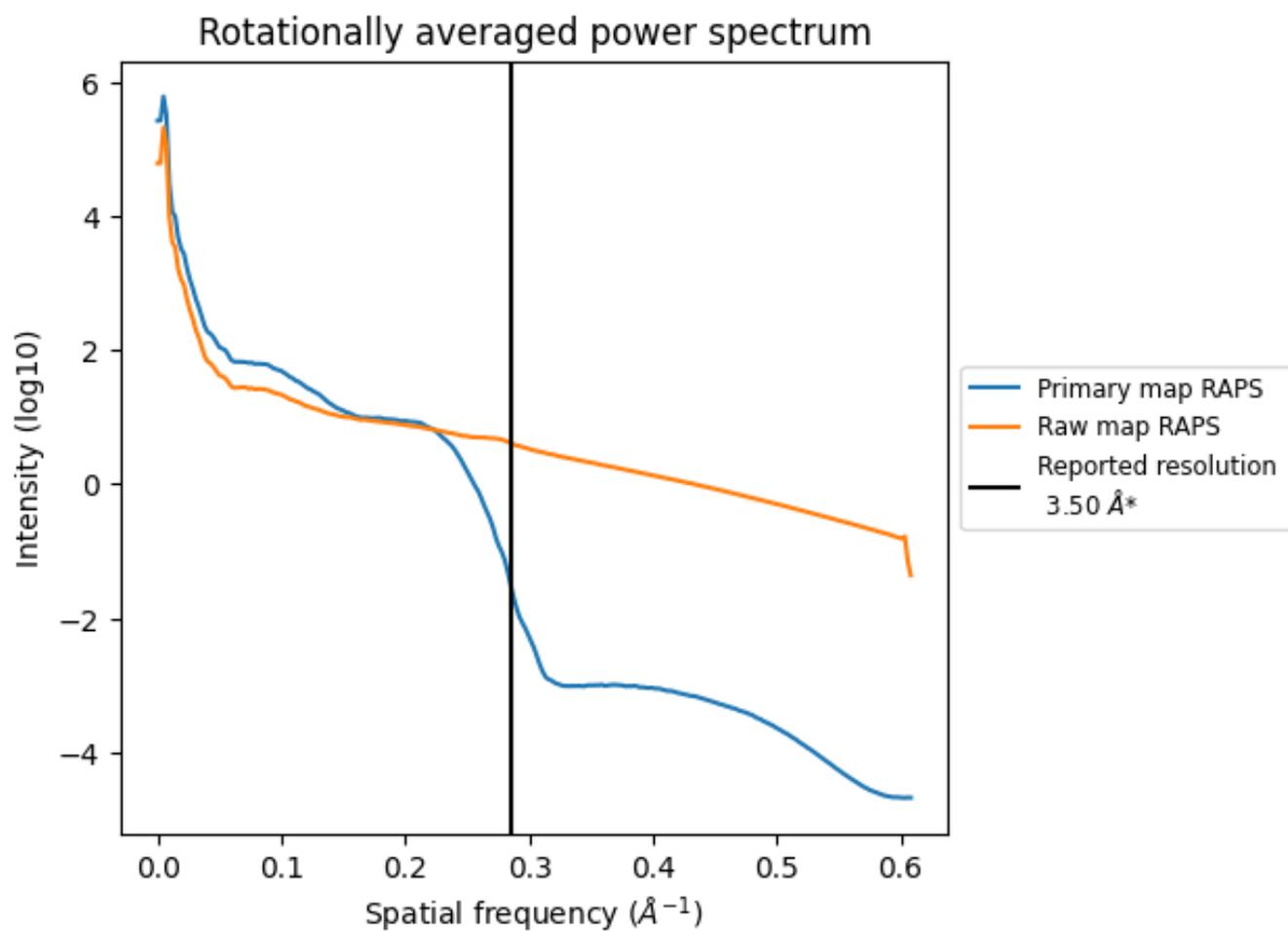
*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

8 Fourier-Shell correlation ⓘ

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 ⓘ
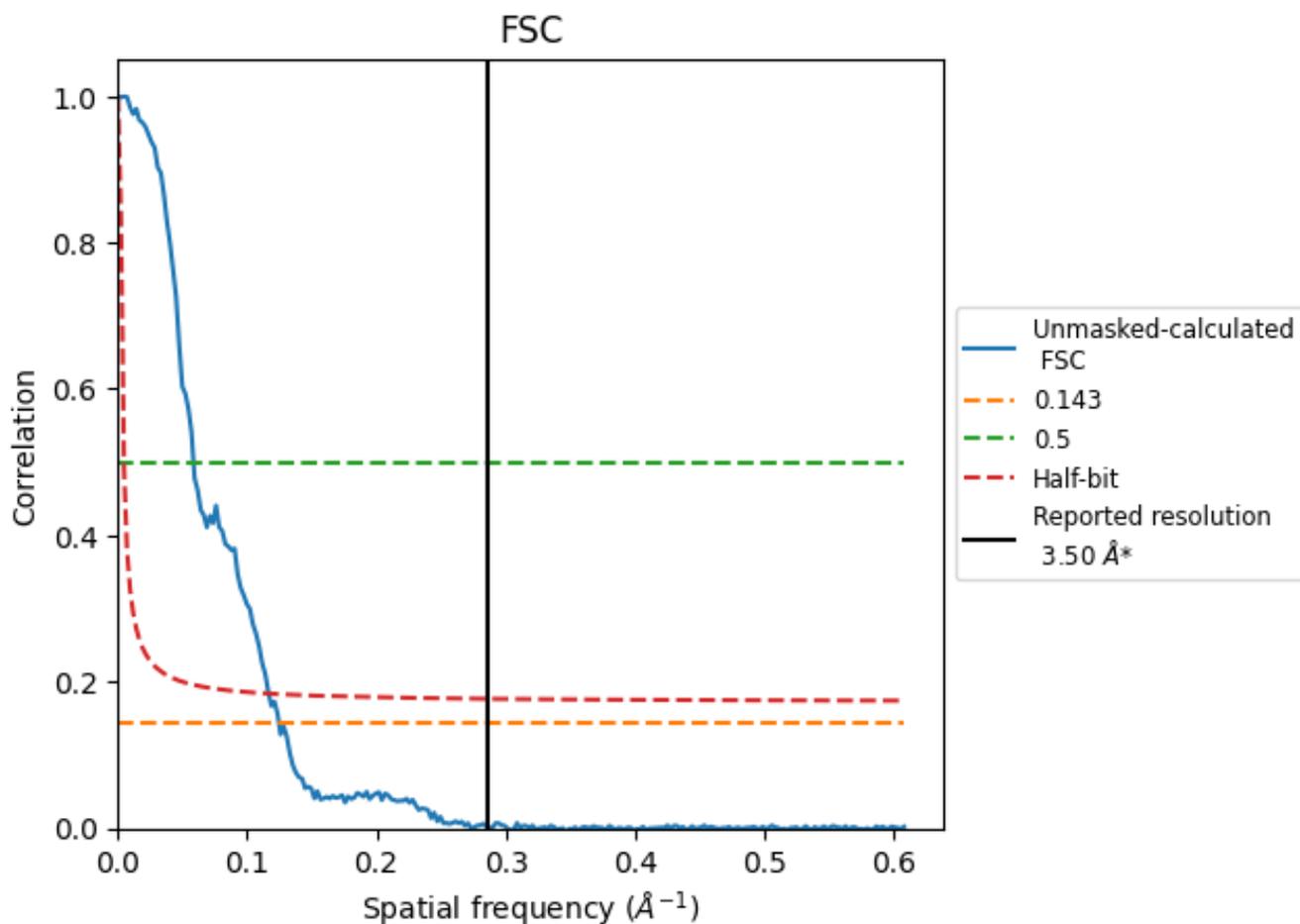
*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	8.03	17.06	8.57

*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 8.03 differs from the reported value 3.5 by more than 10 %

9　Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-42267 and PDB model 8UHA. Per-residue inclusion information can be found in section 3 on page 8.

9.1　Map-model overlay ⓘ


X　　　　　　　　　　　Y　　　　　　　　　　　Z
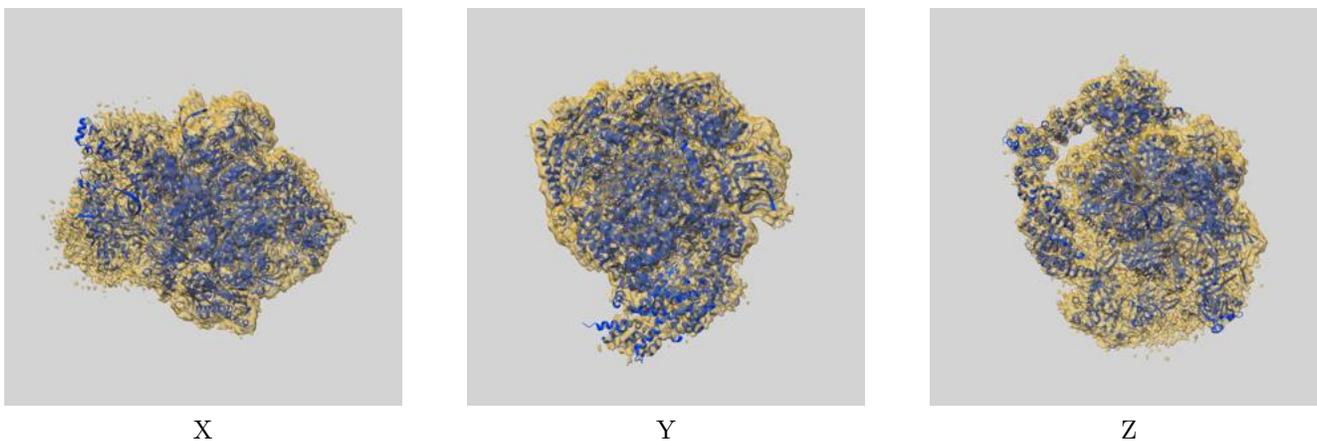
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ
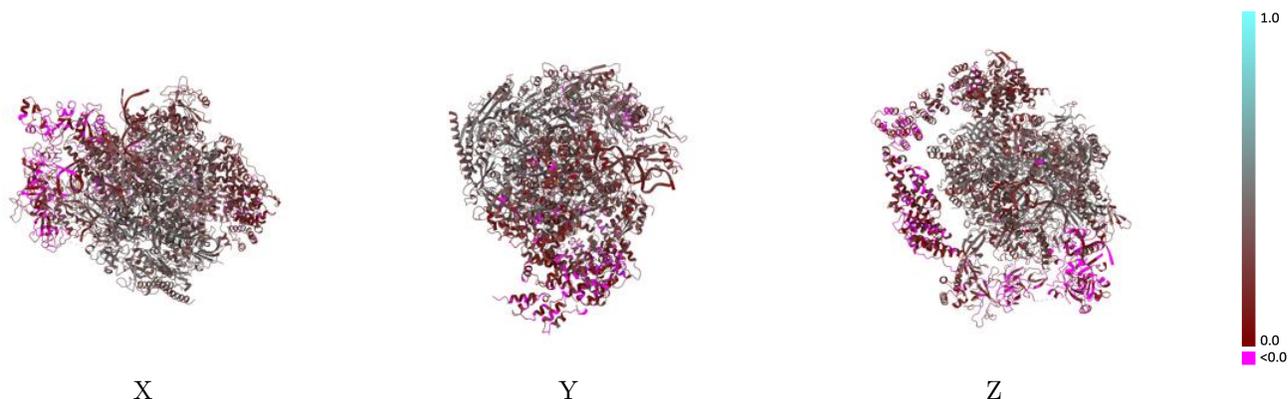
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 ⓘ
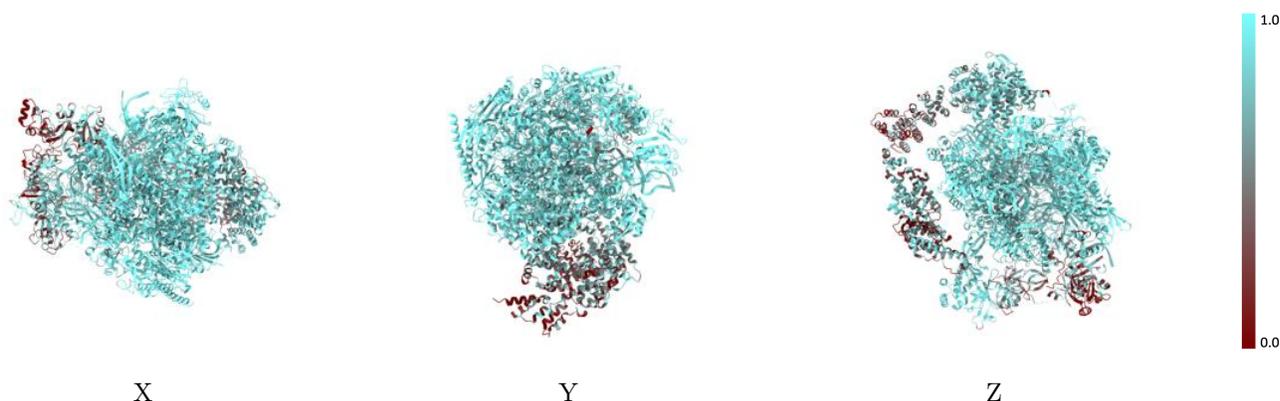
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.4).

9.4 Atom inclusion (i)
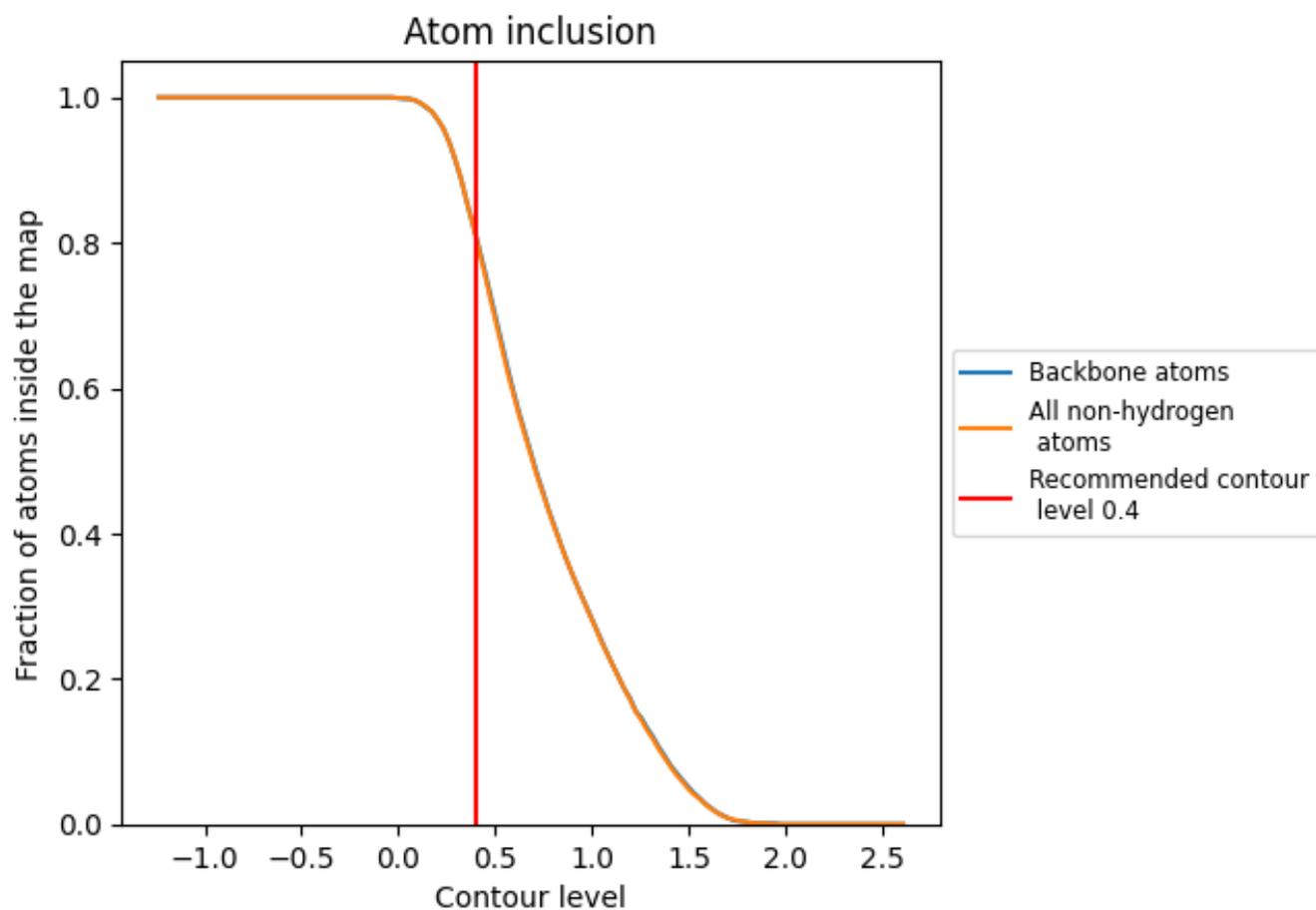
At the recommended contour level, 81% of all backbone atoms, 81% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.4) and Q-score for
the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8090	0.2780
A	0.9100	0.3530
B	0.9230	0.3730
C	0.9610	0.4020
D	0.9220	0.1800
E	0.9370	0.3400
F	0.9400	0.3890
G	0.9450	0.2350
H	0.9610	0.3820
I	0.9600	0.3400
J	0.9560	0.4040
K	0.9530	0.3920
L	0.9610	0.3730
N	0.8350	0.1350
P	0.9270	0.2830
T	0.8590	0.1770
U	0.7790	0.2070
V	0.4500	0.0920
W	0.6740	0.1990
X	0.6120	0.1050
Y	0.3130	0.0170
Z	0.5270	0.0910

1.0

0.0
<0.0