



## Full wwPDB EM Validation Report ⓘ

Jun 26, 2023 – 12:13 PM EDT

PDB ID : 8FYD  
EMDB ID : EMD-29565  
Title : Cryo-EM structure of Cas1:Cas2-DEDDh:half-site integration complex bent CRISPR repeat conformation  
Authors : Skopintsev, P.; Tuck, O.T.; Soczek, K.M.; Doudna, J.  
Deposited on : 2023-01-25  
Resolution : 3.90 Å(reported)

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.dev50  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.33

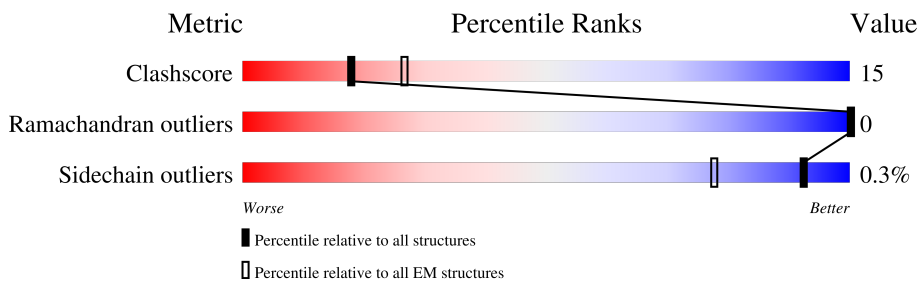
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



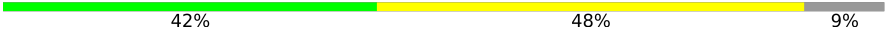

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	J	78	
2	A	289	
2	D	289	
3	B	316	
3	C	316	
3	E	316	
3	F	316	
4	G	64	

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Mol	Chain	Length	Quality of chain
5	H	33	 42% 48% 9%
6	I	44	 16% 14% 70%

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 13612 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 DNA chain called DNA (49-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	J	49	1005	476	190	291	48	0	0

- Molecule 2 is a protein called Cas2-DEDDh.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	93	746	473	129	138	6	0	0
2	D	93	746	473	129	138	6	0	0

- Molecule 3 is a protein called Cas1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	292	2295	1454	415	421	5	0	0
3	C	278	2163	1366	400	392	5	0	0
3	E	288	2261	1431	411	414	5	0	0
3	F	281	2188	1383	403	397	5	0	0

- Molecule 4 is a DNA chain called DNA (64-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	G	64	1330	631	245	390	64	1	0

- Molecule 5 is a DNA chain called DNA (30-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	H	30	613	293	112	179	29	0	0

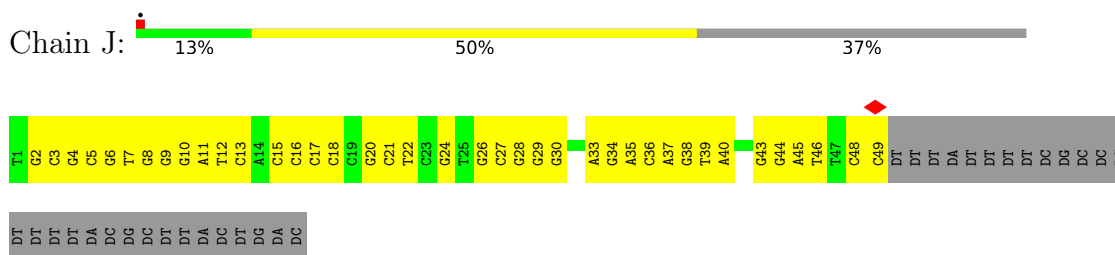
- Molecule 6 is a DNA chain called DNA (13-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	I	13	265	127	47	78	13	0	0

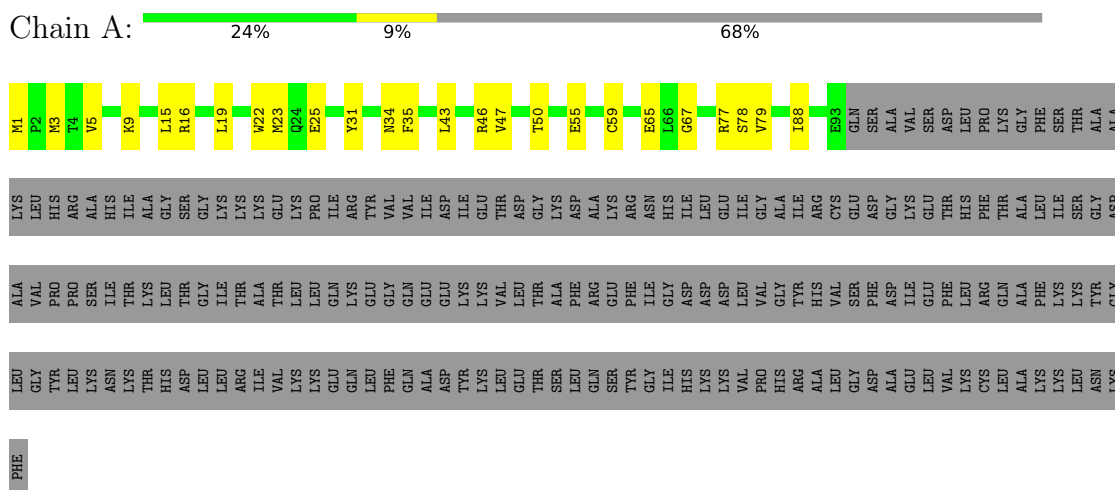
### 3 Residue-property plots [i](#)

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.

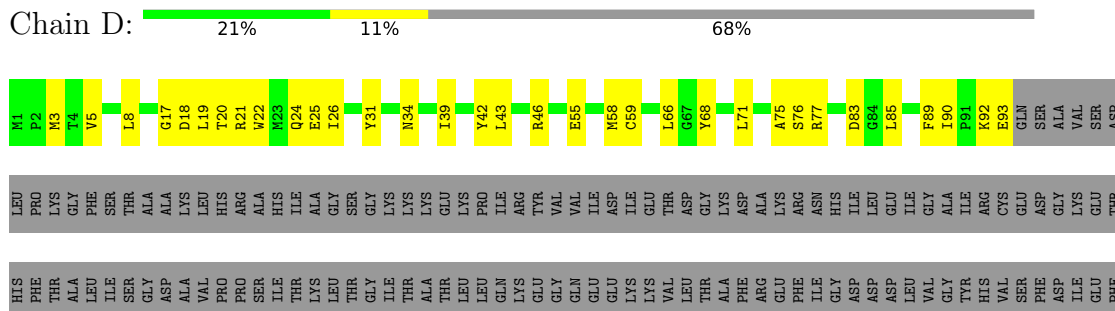
- Molecule 1: DNA (49-MER)



- Molecule 2: Cas2-DEDDh



- Molecule 2: Cas2-DEDDh



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

- Molecule 3: Cas1

Chain B: 65% 28% 8%

MET	ALA	GLY	PRO	ILE	ILE	ALA	GLY	SER	GLU	TYR	SER	SER	GLU	LEU	PRO	ARG	THR	VAL	HIS	ASP	GLU	D20	I25	I25	H29	A30	K31	I32	N33	R34	L35	V35	D36	A42	V48	R49	I50	V57	L58	L58	L59	L60	L60	G61	G62	G63	T64	I66	D65	I66	S67	H68	V71	E72	L73	L74	G78	T79	A80	L81
V82	M83	V89	R90	Y91	Y92	A93	S94	C95	A99	T113	S117	Y229	V121	A122	R123	R124	M125	Y126	R129	F130	S136	K137	R34	L138	T139	M140	L143	T278	R144	E147	R150	V151	R152	R153	R156	S159	K160	I66	V164	K167	K168	R169	V170	Q184	A185	H190	A80	V191												
L196	H197	H198	G209	V213	H214	I222	Y223	D224	L228	Y229	K230	V121	A122	R123	R124	M125	Y126	R256	L257	R260	L269	K270	V273	Q277	L278	L279	I288	E289	A290	E291	P292	L293	S294	L295	V296	D297	D298	K299	E300	Y309	S310	E311	VAL	THR	SER	PRO														

- Molecule 3: Cas1

Chain C: 59% 29% 12%

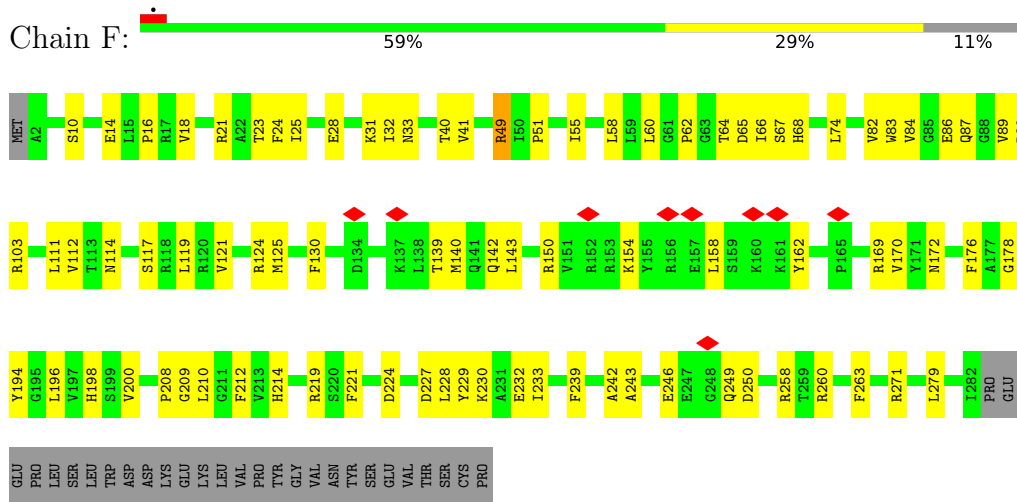
MET	R2	K9	S10	P16	E19	R21	I25	E28	H29	E30	A30	K31	I32	R33	R34	V41	A42	E43	V48	P51	A52	A53	H54	I55	L59	L60	L60	G61	T64	H68	R69	A70	E71	E72	D76	L81	H82	M83	H84	Q87	G88	H89	R90	Y92	A93						
R103	F104	L105	L111	V112	T113	M114	R116	R117	S117	L119	R120	R123	A30	R124	M125	Y126	Q127	M128	V135	I32	S136	K137	L138	T139	M140	Q141	A52	L143	R144	S145	H146	R150	Y155	L158	S159	K160	M166	K167	Y171	N172	P173	D174	D175	F176	A177	G178	P181	L182	H183	Q184	
H190	V191	Y194	G195	L196	V201	L206	L210	V213	I222	Y223	D224	D227	L228	Y229	K230	I233	T234	V235	P236	F239	R260	F263	L268	L269	L279	LEU	GLU	ILE	PRO	GLU	GLY	GLY	GLN	ILE	GLU	ALA	GLU	GLU	PRO	PRO	LEU	SER	LEU	TRP	ASP	ASP	LYS				
GLU	LYS	LEU	VAL	TYR	VAL	ASN	TYR	GLU	VAL	THR	SER	CYS	PRO																																						

- Molecule 3: Cas1

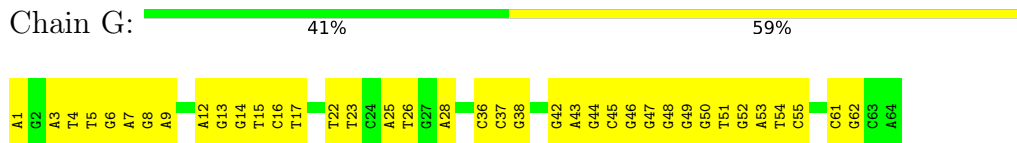
Chain E: 61% 30% 9%

MET	ALA	GLY	PRO	ILE	ILE	ALA	GLY	LYS	GLU	TYR	SER	SER	GLU	LEU	PRO	ARG	THR	VAL	HIS	ASP	GLU	D20	R21	K31	I32	N33	R34	V35	D36	S37	T40	V41	V48	R49	I50	I55	L58	L59	L60	T64	D65	I66	S67	H68	R69	E72	L73	L74	G75	D76	T77	G78	T79	A80	L81
Q87	G88	R90	R96	A97	A99	L105	V106	K107	Q108	A109	R219	L111	V112	T113	S117	L119	Q127	M128	R118	L119	Q127	N128	R129	PHE	PRO	THR	GLU	D134	V135	T139	M140	Q141	Q142	S145	R150	V151	R152	K154	L158	K161	R169	F176	M183	Q184	V191										
A192	L193	Y194	H198	V201	L206	S207	P208	L105	V106	K107	D218	R219	S220	F221	I222	Y223	D224	Y229	K230	Q239	A231	E232	I233	T234	Q253	R256	L257	R260	V264	R271	M272	V273	Q277	T278	L279	Q287	I288	E289	A290	S294	L295	V296	D297	D298	K299	V303									
E311	VAL	THR	SER	CYS	PRO																																																		

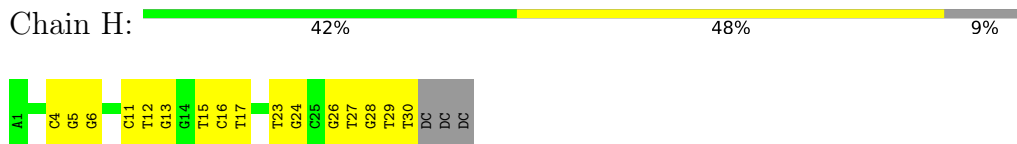
Molecule 3: Cas1



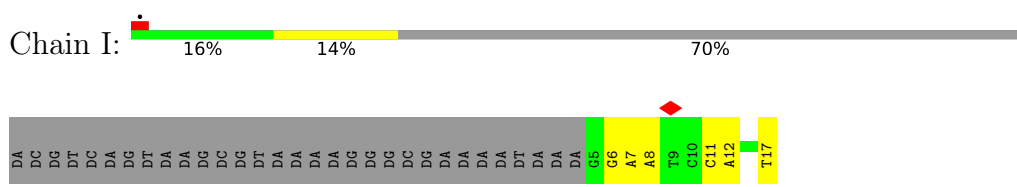
Molecule 4: DNA (64-MER)



Molecule 5: DNA (30-MER)



Molecule 6: DNA (13-MER)





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	53545	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 ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.562	Depositor
Minimum map value	-0.369	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.05	Depositor
Map size ( $\text{\AA}$ )	267.6, 267.6, 267.6	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.115, 1.115, 1.115	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	J	0.53	0/1128	0.86	0/1740
2	A	0.26	0/761	0.56	0/1029
2	D	0.26	0/761	0.55	0/1029
3	B	0.25	0/2338	0.51	0/3164
3	C	0.25	0/2201	0.55	0/2975
3	E	0.25	0/2301	0.51	0/3111
3	F	0.25	0/2226	0.55	0/3009
4	G	0.53	0/1491	0.88	0/2300
5	H	0.50	0/687	0.84	0/1059
6	I	0.52	0/296	0.93	0/454
All	All	0.34	0/14190	0.65	0/19870

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	J	1005	0	550	45	0
2	A	746	0	740	21	0
2	D	746	0	740	27	0
3	B	2295	0	2325	67	0
3	C	2163	0	2212	77	0
3	E	2261	0	2295	69	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	2188	0	2240	79	0
4	G	1330	0	731	32	0
5	H	613	0	340	17	0
6	I	265	0	148	6	0
All	All	13612	0	12321	380	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 15.

All (380) 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:D:17:GLY:O	2:D:20:THR:HG22	1.31	1.29
1:J:35:DA:H2''	1:J:36:DC:H5'	1.58	0.84
3:F:229:TYR:HE1	3:F:271:ARG:NH2	1.75	0.84
3:E:87:GLN:HE22	3:E:260:ARG:HG3	1.42	0.83
3:F:87:GLN:HE22	3:F:90:ARG:HD3	1.46	0.81
3:F:111:LEU:HD12	3:F:117:SER:HB3	1.67	0.76
3:F:229:TYR:CE1	3:F:271:ARG:NH2	2.53	0.76
2:D:55:GLU:HG3	2:D:75:ALA:HA	1.66	0.76
3:F:229:TYR:HE1	3:F:271:ARG:CZ	2.01	0.73
3:C:227:ASP:HA	3:C:230:LYS:HE3	1.71	0.72
3:E:111:LEU:HD13	3:E:117:SER:HB3	1.70	0.72
1:J:38:DG:H3'	1:J:39:DT:H71	1.72	0.72
1:J:29:DG:H3'	1:J:30:DG:H21	1.54	0.71
3:E:89:VAL:HG21	3:E:256:ARG:HG3	1.73	0.69
3:F:154:LYS:HZ3	3:F:158:LEU:HD11	1.57	0.69
2:D:66:LEU:HD13	2:D:85:LEU:HD11	1.75	0.69
3:B:57:VAL:HG22	3:B:80:ALA:HB3	1.75	0.68
3:F:58:LEU:HD13	3:F:74:LEU:HD21	1.74	0.68
2:A:46:ARG:NH2	3:C:10:SER:OG	2.26	0.67
3:F:24:PHE:O	3:F:260:ARG:NH2	2.28	0.67
3:B:82:VAL:HG23	3:B:94:SER:HB3	1.77	0.66
4:G:47:DG:H2'	4:G:48:DG:H8	1.61	0.65
3:B:74:LEU:HD13	3:B:81:LEU:HD21	1.79	0.65
3:B:129:ARG:HH21	3:B:228:LEU:HD12	1.61	0.65
3:E:21:ARG:NH2	3:E:289:GLU:OE1	2.29	0.64
2:A:15:LEU:HD12	2:A:50:THR:HB	1.79	0.64
3:B:31:LYS:NZ	4:G:1:DA:O5'	2.30	0.64
3:E:74:LEU:HD13	3:E:81:LEU:HD21	1.79	0.64
3:F:84:VAL:HG12	3:F:89:VAL:HG23	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:18:VAL:HA	3:F:21:ARG:HE	1.63	0.64
4:G:54:DT:H2''	4:G:55:DC:C5	2.33	0.64
3:E:277:GLN:NE2	3:E:288:ILE:O	2.25	0.63
3:F:28:GLU:HG3	3:F:62:PRO:HD2	1.80	0.63
3:C:21:ARG:NH1	3:C:53:ALA:O	2.32	0.62
3:C:158:LEU:HD21	3:C:236:PRO:HA	1.82	0.62
3:F:140:MET:HA	3:F:143:LEU:HD12	1.82	0.62
2:D:77:ARG:HD3	2:D:90:ILE:HG12	1.82	0.62
3:C:190:HIS:HE1	3:C:230:LYS:HB2	1.65	0.62
3:E:36:ASP:OD1	3:E:37:SER:N	2.32	0.61
4:G:47:DG:H2'	4:G:48:DG:C8	2.36	0.61
3:E:169:ARG:NH1	4:G:28:DA:OP1	2.30	0.61
2:A:65:GLU:OE2	3:F:260:ARG:NH1	2.33	0.60
3:B:25:ILE:HD11	3:B:295:LEU:HD22	1.84	0.60
4:G:46:DG:H1'	4:G:47:DG:N7	2.16	0.60
4:G:52:DG:H2''	4:G:53:DA:C8	2.37	0.60
3:C:213:VAL:N	3:C:224:ASP:OD2	2.35	0.59
2:A:77:ARG:HH12	2:D:25:GLU:HG2	1.66	0.59
1:J:36:DC:O3'	3:E:141:GLN:HG2	2.02	0.59
3:C:114:ASN:HB3	3:C:117:SER:HB2	1.83	0.59
3:F:214:HIS:ND1	3:F:224:ASP:OD1	2.33	0.59
1:J:37:DA:H2''	1:J:38:DG:O5'	2.02	0.59
3:B:20:ASP:HB2	3:B:288:ILE:HG22	1.84	0.59
3:C:34:ARG:NH1	4:G:4:DT:OP1	2.36	0.59
3:B:123:ARG:NE	3:B:138:LEU:O	2.35	0.59
3:E:68:HIS:CD2	3:F:62:PRO:HA	2.38	0.59
3:F:23:THR:HG22	3:F:24:PHE:HD1	1.67	0.59
3:C:48:VAL:HG12	2:D:89:PHE:HA	1.84	0.59
1:J:2:DG:OP1	3:B:153:ARG:NH1	2.36	0.58
3:C:123:ARG:NH1	3:C:136:SER:O	2.36	0.58
3:C:166:TRP:HD1	3:C:167:LYS:H	1.52	0.58
6:I:11:DC:H2''	6:I:12:DA:C8	2.38	0.58
3:F:92:TYR:HD2	3:F:219:ARG:HD2	1.69	0.57
3:E:214:HIS:ND1	3:E:224:ASP:OD1	2.37	0.57
3:F:112:VAL:HG11	3:F:210:LEU:HB3	1.85	0.57
4:G:22:DT:H2'	4:G:23:DT:C6	2.40	0.57
1:J:8:DG:H2'	1:J:9:DG:N7	2.18	0.57
3:C:112:VAL:HG11	3:C:210:LEU:HG	1.87	0.57
1:J:39:DT:H2''	1:J:40:DA:H5'	1.86	0.57
3:F:208:PRO:HA	3:F:221:PHE:HB3	1.86	0.57
3:B:191:VAL:HG21	5:H:26:DG:H4'	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:81:LEU:HB2	3:C:93:ALA:HB3	1.86	0.57
3:E:35:VAL:HG23	3:E:36:ASP:H	1.70	0.57
3:E:213:VAL:N	3:E:224:ASP:OD2	2.37	0.57
3:B:129:ARG:O	3:B:150:ARG:NH1	2.38	0.56
3:B:270:LYS:NZ	3:B:291:GLU:OE2	2.38	0.56
1:J:13:DC:OP1	3:C:103:ARG:NH2	2.38	0.56
3:F:246:GLU:OE1	3:F:249:GLN:NE2	2.38	0.56
3:F:18:VAL:HG21	3:F:200:VAL:HG23	1.87	0.56
3:E:277:GLN:HB3	3:E:287:GLN:HG2	1.88	0.56
3:E:119:LEU:HB2	3:E:140:MET:HE1	1.87	0.56
2:A:5:VAL:HG12	2:A:59:CYS:HB3	1.88	0.56
3:C:126:TYR:OH	3:C:150:ARG:NE	2.39	0.55
3:E:96:ARG:HG2	3:E:97:ALA:H	1.70	0.55
3:B:293:LEU:HD11	3:B:301:LYS:HD2	1.89	0.55
3:B:25:ILE:HG23	3:B:58:LEU:HD23	1.89	0.55
3:C:260:ARG:HH12	2:D:85:LEU:HB2	1.71	0.55
3:F:158:LEU:HB3	3:F:239:PHE:CE2	2.42	0.55
2:A:9:LYS:HB3	2:A:55:GLU:HB3	1.89	0.55
3:E:31:LYS:HG3	3:E:65:ASP:HB2	1.89	0.55
4:G:8:DG:H4'	4:G:9:DA:OP1	2.06	0.55
3:B:68:HIS:HB2	3:C:64:THR:HG22	1.89	0.54
3:C:155:TYR:HB3	3:C:166:TRP:CH2	2.43	0.54
3:E:31:LYS:NZ	3:E:65:ASP:OD2	2.40	0.54
1:J:39:DT:H2''	1:J:40:DA:C8	2.42	0.54
3:B:214:HIS:ND1	3:B:224:ASP:OD1	2.40	0.54
1:J:12:DT:H5''	3:C:103:ARG:HE	1.73	0.54
1:J:17:DC:H2'	1:J:18:DC:C6	2.43	0.54
2:A:34:ASN:ND2	2:D:66:LEU:O	2.40	0.53
3:F:33:ASN:O	3:F:40:THR:OG1	2.23	0.53
3:F:176:PHE:HZ	3:F:183:ASN:HB3	1.72	0.53
3:B:184:GLN:HB2	3:B:251:ILE:HD11	1.90	0.53
1:J:20:DG:N2	4:G:46:DG:OP1	2.35	0.53
3:C:140:MET:HA	3:C:143:LEU:HD12	1.91	0.53
3:E:191:VAL:HA	3:E:194:TYR:HD2	1.73	0.53
3:F:176:PHE:CZ	3:F:183:ASN:HB3	2.44	0.53
1:J:13:DC:H42	4:G:52:DG:H1	1.57	0.53
3:B:34:ARG:HD2	3:B:73:LEU:HD22	1.91	0.53
3:E:229:TYR:HB3	3:E:233:ILE:HD12	1.90	0.53
3:E:257:LEU:HD22	3:E:260:ARG:HE	1.74	0.53
4:G:42:DG:H2''	4:G:43:DA:C8	2.44	0.53
3:B:123:ARG:HD3	3:B:143:LEU:HD11	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:92:LYS:NZ	2:D:93:GLU:O	2.41	0.53
3:E:41:VAL:HB	3:E:48:VAL:HB	1.90	0.53
3:F:32:ILE:HG13	3:F:41:VAL:HG22	1.91	0.52
3:B:168:LYS:HG2	3:B:170:VAL:HG13	1.91	0.52
1:J:3:DC:H41	3:B:152:ARG:HH22	1.56	0.52
1:J:28:DG:H3'	3:F:103:ARG:HH22	1.75	0.52
2:A:16:ARG:NH2	5:H:15:DT:OP2	2.42	0.52
3:C:190:HIS:CE1	3:C:230:LYS:HB2	2.43	0.52
3:B:62:PRO:HB3	3:C:69:ARG:HH12	1.75	0.52
1:J:8:DG:H2'	1:J:9:DG:C8	2.45	0.52
3:C:139:THR:H	3:C:142:GLN:NE2	2.08	0.52
3:C:60:LEU:O	3:C:84:VAL:N	2.43	0.52
3:C:127:GLN:NE2	3:C:128:MET:SD	2.83	0.52
2:A:35:PHE:HE2	2:A:43:LEU:HD13	1.75	0.52
3:B:113:THR:HG21	3:C:113:THR:HG21	1.93	0.52
2:D:8:LEU:HD12	2:D:31:TYR:HE2	1.74	0.52
1:J:21:DC:H1'	1:J:22:DT:C5	2.45	0.51
3:C:89:VAL:HG22	3:C:191:VAL:HG23	1.92	0.51
1:J:15:DC:H2'	1:J:16:DC:C6	2.45	0.51
3:F:67:SER:OG	3:F:68:HIS:N	2.40	0.51
2:A:1:MET:HE1	2:A:34:ASN:HB3	1.91	0.51
3:F:169:ARG:HH12	3:F:172:ASN:H	1.56	0.51
3:B:89:VAL:HG21	3:B:256:ARG:HG3	1.91	0.51
3:B:125:MET:HG2	3:B:279:LEU:HD11	1.92	0.51
3:F:23:THR:HG21	3:F:263:PHE:HD2	1.74	0.51
3:C:104:PHE:HB3	3:C:206:LEU:HD21	1.92	0.51
3:F:227:ASP:HA	3:F:230:LYS:HB2	1.93	0.51
4:G:13:DG:H1'	4:G:14:DG:H5'	1.92	0.51
3:C:182:ILE:HD11	3:C:239:PHE:HD1	1.75	0.51
5:H:5:DG:H2''	5:H:6:DG:H8	1.76	0.51
3:E:55:ILE:O	3:E:79:THR:OG1	2.28	0.51
3:E:273:VAL:HG11	3:E:290:ALA:HB3	1.92	0.51
1:J:34:DG:H2''	1:J:35:DA:O5'	2.10	0.50
3:B:196:LEU:HD21	3:B:269:LEU:HD13	1.93	0.50
3:C:32:ILE:HD12	3:C:60:LEU:HD21	1.93	0.50
5:H:27:DT:H2''	5:H:28:DG:N3	2.26	0.50
2:D:24:GLN:HE21	3:F:51:PRO:HG3	1.76	0.50
3:E:35:VAL:HG13	3:E:40:THR:HG21	1.94	0.50
3:F:191:VAL:HA	3:F:194:TYR:HB2	1.94	0.50
3:B:126:TYR:HE1	3:B:147:GLU:HB2	1.76	0.50
3:E:107:LYS:HD3	3:E:107:LYS:N	2.27	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:H:4:DC:H2''	5:H:5:DG:C8	2.47	0.50
2:A:15:LEU:HD21	2:A:47:VAL:HG23	1.94	0.49
3:B:91:TYR:CD2	3:B:198:HIS:HD2	2.31	0.49
3:C:30:ALA:HB2	3:C:43:GLU:HG2	1.95	0.49
3:E:76:ASP:OD1	3:F:90:ARG:NH2	2.39	0.49
3:E:77:THR:HG1	3:E:79:THR:HG1	1.60	0.49
3:E:150:ARG:HD3	3:E:153:ARG:HH21	1.77	0.49
1:J:40:DA:H5'	1:J:40:DA:C8	2.47	0.49
3:E:158:LEU:HA	3:E:161:LYS:HB3	1.94	0.49
3:F:124:ARG:NH1	3:F:279:LEU:HA	2.27	0.49
3:F:232:GLU:HB3	3:F:233:ILE:HD12	1.94	0.49
3:F:40:THR:HG22	3:F:49:ARG:HG3	1.93	0.49
1:J:36:DC:H2''	1:J:37:DA:C8	2.47	0.49
3:C:32:ILE:HG12	3:C:41:VAL:HG22	1.93	0.49
2:D:55:GLU:OE2	2:D:76:SER:N	2.45	0.49
5:H:11:DC:H2'	5:H:12:DT:C6	2.47	0.49
4:G:12:DA:H2''	4:G:13:DG:C8	2.48	0.49
3:E:218:ASP:OD1	3:E:219:ARG:HG3	2.13	0.49
3:C:25:ILE:HD11	3:C:55:ILE:HD12	1.95	0.48
2:A:88:ILE:HD11	2:D:26:ILE:HG22	1.95	0.48
3:E:48:VAL:HG11	3:E:295:LEU:HD13	1.94	0.48
5:H:4:DC:H2''	5:H:5:DG:H8	1.78	0.48
3:B:50:ILE:H	3:B:50:ILE:HD12	1.78	0.48
3:E:60:LEU:HB3	3:E:64:THR:HG21	1.95	0.48
3:E:78:GLY:HA3	3:E:99:ALA:HA	1.96	0.48
3:F:121:VAL:O	3:F:125:MET:HE3	2.12	0.48
3:C:16:PRO:O	3:C:21:ARG:NH2	2.47	0.48
3:F:112:VAL:HG12	3:F:212:PHE:HE1	1.78	0.48
3:B:78:GLY:O	3:B:99:ALA:N	2.44	0.48
3:E:193:LEU:HB2	3:E:234:THR:HG21	1.94	0.48
1:J:24:DG:C8	1:J:24:DG:H5'	2.49	0.48
3:E:219:ARG:HB2	3:E:223:TYR:CZ	2.48	0.48
3:F:86:GLU:O	3:F:87:GLN:NE2	2.46	0.48
2:A:67:GLY:HA3	2:D:34:ASN:ND2	2.29	0.48
3:B:48:VAL:HG12	3:B:309:TYR:HA	1.95	0.48
3:C:119:LEU:O	3:C:123:ARG:HG2	2.14	0.48
3:C:123:ARG:NH2	3:C:138:LEU:H	2.12	0.48
3:C:233:ILE:O	3:C:236:PRO:HD2	2.13	0.48
3:E:257:LEU:HD22	3:E:260:ARG:HH21	1.79	0.48
1:J:44:DG:H2''	1:J:45:DA:C8	2.48	0.48
3:C:126:TYR:CD2	3:C:135:VAL:HG21	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:230:LYS:HA	3:C:234:THR:HG22	1.96	0.47
3:F:23:THR:HG23	3:F:196:LEU:HD12	1.96	0.47
4:G:44:DG:H2'	4:G:45:DC:O4'	2.13	0.47
3:B:71:VAL:HG21	3:C:83:TRP:NE1	2.29	0.47
3:E:72:GLU:OE2	3:F:90:ARG:NH2	2.48	0.47
3:B:31:LYS:O	3:B:42:ALA:N	2.40	0.47
2:D:22:TRP:CG	2:D:43:LEU:HD11	2.49	0.47
3:E:32:ILE:HB	3:E:66:ILE:HD12	1.95	0.47
3:B:60:LEU:HD11	3:B:81:LEU:HD12	1.96	0.47
3:B:91:TYR:CE2	3:B:198:HIS:HD2	2.32	0.47
3:C:111:LEU:HD13	3:C:117:SER:HB3	1.96	0.47
3:C:124:ARG:O	3:C:128:MET:HG2	2.14	0.47
3:E:35:VAL:HG23	3:E:36:ASP:N	2.30	0.47
3:F:228:LEU:HD22	3:F:229:TYR:CE2	2.50	0.47
4:G:48:DG:H2'	4:G:49:DG:C8	2.49	0.47
5:H:27:DT:H2''	5:H:28:DG:H5''	1.97	0.47
3:B:31:LYS:HB2	3:B:42:ALA:HB3	1.96	0.47
3:B:294:SER:HB3	3:B:297:ASP:HB3	1.97	0.47
3:E:229:TYR:CZ	3:E:272:MET:HG2	2.50	0.47
1:J:38:DG:C2	6:I:17:DT:C2	3.02	0.47
3:F:60:LEU:HG	3:F:64:THR:HG21	1.95	0.47
3:F:94:SER:HB3	3:F:198:HIS:CE1	2.49	0.47
3:F:114:ASN:HB3	3:F:117:SER:HB2	1.96	0.47
3:B:29:HIS:HD2	4:G:1:DA:C5	2.33	0.47
3:E:176:PHE:O	3:E:184:GLN:NE2	2.48	0.47
3:F:24:PHE:H	3:F:260:ARG:HH22	1.61	0.47
3:E:72:GLU:O	3:F:90:ARG:NH2	2.48	0.46
3:B:32:ILE:HD11	3:B:66:ILE:HG23	1.97	0.46
3:B:140:MET:O	3:B:144:ARG:HG2	2.16	0.46
3:F:139:THR:HG23	3:F:142:GLN:H	1.80	0.46
3:C:116:ARG:HH11	3:C:120:ARG:HH12	1.63	0.46
4:G:25:DA:H5'	4:G:26:DT:H5'	1.97	0.46
3:E:152:ARG:HE	6:I:17:DT:H4'	1.81	0.46
3:B:198:HIS:HA	3:B:222:ILE:HD12	1.97	0.46
3:B:213:VAL:N	3:B:224:ASP:OD2	2.47	0.46
3:B:256:ARG:NH2	5:H:23:DT:OP1	2.46	0.46
3:B:269:LEU:HD23	3:B:292:PRO:HB3	1.97	0.46
3:C:120:ARG:O	3:C:124:ARG:HG2	2.16	0.46
1:J:7:DT:H3'	1:J:8:DG:H8	1.81	0.46
2:D:18:ASP:OD2	2:D:46:ARG:NH1	2.49	0.46
3:E:64:THR:HG22	3:F:68:HIS:HB2	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:37:DA:H5'	3:E:141:GLN:HG3	1.97	0.45
2:A:15:LEU:HD11	2:A:47:VAL:HA	1.98	0.45
3:B:29:HIS:HE2	5:H:23:DT:H3	1.65	0.45
3:C:28:GLU:HG3	3:C:61:GLY:HA3	1.98	0.45
3:F:93:ALA:O	3:F:198:HIS:NE2	2.42	0.45
3:F:162:TYR:HB3	3:F:243:ALA:HB2	1.98	0.45
3:B:273:VAL:HG11	3:B:290:ALA:H	1.82	0.45
1:J:10:DG:H2''	1:J:11:DA:N7	2.32	0.45
3:C:87:GLN:HB2	3:C:176:PHE:O	2.16	0.45
3:E:87:GLN:NE2	3:E:260:ARG:HG3	2.22	0.45
3:E:154:LYS:NZ	3:E:231:ALA:HB1	2.32	0.45
4:G:4:DT:H2'	4:G:5:DT:H71	1.99	0.45
2:A:23:MET:HG3	2:A:31:TYR:HB3	1.99	0.45
3:C:260:ARG:NH2	2:D:83:ASP:O	2.50	0.45
3:F:183:ASN:O	3:F:186:LEU:HG	2.16	0.45
3:B:81:LEU:HB2	3:C:91:TYR:CE2	2.52	0.45
3:B:277:GLN:NE2	3:B:288:ILE:HG12	2.32	0.45
3:C:171:TYR:HD2	3:C:190:HIS:CD2	2.34	0.45
3:E:127:GLN:HB3	3:E:135:VAL:HG11	1.98	0.45
3:E:198:HIS:HA	3:E:201:VAL:HG12	1.99	0.45
1:J:43:DG:H2''	1:J:44:DG:N7	2.32	0.45
3:B:159:SER:OG	3:B:164:VAL:O	2.26	0.45
3:F:130:PHE:HE2	3:F:150:ARG:HB3	1.81	0.45
4:G:16:DC:C6	4:G:17:DT:H72	2.52	0.45
2:A:3:MET:SD	2:D:3:MET:HB3	2.56	0.45
1:J:26:DG:H2''	1:J:27:DC:OP2	2.17	0.44
3:B:83:TRP:CE2	3:C:71:VAL:HG21	2.53	0.44
3:B:92:TYR:HB3	3:C:72:GLU:HB3	1.99	0.44
3:F:119:LEU:HD11	3:F:140:MET:HB2	1.99	0.44
4:G:37:DC:H2'	4:G:38:DG:N3	2.32	0.44
1:J:6:DG:H3'	1:J:7:DT:H72	1.99	0.44
1:J:34:DG:H2''	1:J:35:DA:H8	1.81	0.44
3:B:36:ASP:OD1	3:B:36:ASP:N	2.50	0.44
3:C:166:TRP:CD1	3:C:167:LYS:N	2.85	0.44
5:H:29:DT:H2''	5:H:30:DT:C6	2.52	0.44
3:C:142:GLN:O	3:C:145:SER:OG	2.30	0.44
2:D:39:ILE:HD13	3:F:16:PRO:HG3	1.98	0.44
3:B:257:LEU:HA	3:B:260:ARG:HG2	1.98	0.44
3:F:182:ILE:HD12	3:F:242:ALA:HB1	1.99	0.44
3:B:126:TYR:CG	3:B:143:LEU:HD22	2.52	0.44
3:C:139:THR:O	3:C:143:LEU:HG	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:48:VAL:HG12	3:E:50:ILE:HG12	1.99	0.44
3:E:109:ALA:O	3:E:113:THR:HG23	2.17	0.44
3:E:260:ARG:O	3:E:264:VAL:HG23	2.17	0.44
2:A:22:TRP:HD1	2:A:35:PHE:CZ	2.36	0.44
3:B:81:LEU:HB2	3:C:91:TYR:HE2	1.83	0.44
3:E:201:VAL:HG22	3:E:206:LEU:HB2	1.98	0.44
3:F:25:ILE:HD11	3:F:55:ILE:HD12	1.99	0.44
3:C:143:LEU:O	3:C:146:HIS:N	2.49	0.44
4:G:49:DG:H2''	4:G:50:DG:C8	2.53	0.44
3:C:19:GLU:HB2	3:C:269:LEU:HB3	2.00	0.44
3:E:232:GLU:OE1	3:E:271:ARG:NH1	2.50	0.44
3:F:229:TYR:HD1	3:F:233:ILE:CD1	2.30	0.44
3:C:182:ILE:HD11	3:C:239:PHE:CD1	2.52	0.44
1:J:49:DC:N3	6:I:6:DG:N2	2.66	0.43
3:B:34:ARG:HH11	3:B:73:LEU:HB2	1.84	0.43
2:D:42:TYR:HD2	3:F:14:GLU:HA	1.81	0.43
3:F:162:TYR:HB2	3:F:239:PHE:CE2	2.53	0.43
1:J:33:DA:C4	1:J:34:DG:C8	3.07	0.43
3:B:156:ARG:HH12	3:B:160:LYS:HB3	1.82	0.43
3:C:228:LEU:HD22	3:C:229:TYR:CZ	2.53	0.43
3:E:90:ARG:NE	4:G:25:DA:OP1	2.52	0.43
3:E:208:PRO:HA	3:E:221:PHE:HB3	2.01	0.43
4:G:36:DC:H2''	4:G:37:DC:H5''	2.00	0.43
2:A:78:SER:OG	2:A:79:VAL:N	2.51	0.43
3:E:105:LEU:HD23	3:F:209:GLY:HA3	2.01	0.43
3:E:34:ARG:HD3	3:E:69:ARG:HG3	2.00	0.43
3:F:169:ARG:NH1	3:F:170:VAL:O	2.51	0.43
3:E:299:LYS:O	3:E:303:VAL:HG23	2.18	0.43
3:F:250:ASP:OD1	3:F:250:ASP:N	2.50	0.43
3:B:95:GLY:HA2	3:C:93:ALA:HA	2.00	0.43
3:B:167:LYS:HD2	3:B:167:LYS:N	2.34	0.43
3:B:117:SER:O	3:B:121:VAL:HG22	2.19	0.43
3:C:196:LEU:HD11	3:C:269:LEU:HD21	1.99	0.43
4:G:14:DG:H2'	4:G:15:DT:H71	2.00	0.43
4:G:61:DC:H2''	4:G:62:DG:C8	2.54	0.42
1:J:4:DG:H2'	1:J:5:DC:C6	2.54	0.42
2:A:19:LEU:O	2:A:23:MET:N	2.37	0.42
3:F:60:LEU:HD23	3:F:83:TRP:CE2	2.54	0.42
3:B:64:THR:O	3:C:68:HIS:N	2.52	0.42
2:D:19:LEU:HD23	2:D:31:TYR:CD2	2.55	0.42
3:F:32:ILE:HB	3:F:66:ILE:HG13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:9:DG:H1'	1:J:10:DG:C5	2.55	0.42
1:J:40:DA:H5'	1:J:40:DA:H8	1.85	0.42
3:B:209:GLY:HA3	3:C:105:LEU:HD23	2.02	0.42
2:D:5:VAL:HG12	2:D:59:CYS:HB3	2.00	0.42
3:F:82:VAL:HG12	3:F:84:VAL:HG13	2.01	0.42
3:F:178:GLY:HA2	3:F:183:ASN:HB2	2.01	0.42
5:H:16:DC:H2'	5:H:17:DT:H71	2.02	0.42
1:J:6:DG:O5'	1:J:6:DG:H8	2.03	0.42
3:C:173:PRO:HG2	3:C:223:TYR:OH	2.20	0.42
3:C:181:PRO:HA	3:C:184:GLN:NE2	2.34	0.42
3:F:258:ARG:HA	3:F:258:ARG:HD3	1.81	0.42
4:G:6:DG:H2''	4:G:7:DA:H8	1.85	0.42
1:J:40:DA:H4'	3:E:152:ARG:HH22	1.84	0.42
1:J:45:DA:H1'	1:J:46:DT:H5'	2.01	0.42
2:A:25:GLU:HG2	2:A:31:TYR:CE1	2.55	0.42
3:E:139:THR:H	3:E:142:GLN:HB3	1.84	0.42
3:E:279:LEU:HD23	3:E:279:LEU:HA	1.92	0.42
3:C:59:LEU:HD23	3:C:84:VAL:HG11	2.02	0.42
3:C:201:VAL:HG11	3:C:222:ILE:HG22	2.01	0.42
3:C:263:PHE:CD1	3:C:268:ILE:HG21	2.55	0.41
1:J:20:DG:H3'	1:J:21:DC:H2'	2.02	0.41
3:C:87:GLN:O	3:C:176:PHE:HB3	2.20	0.41
2:D:18:ASP:OD1	2:D:21:ARG:NH1	2.43	0.41
3:E:58:LEU:HB2	3:E:81:LEU:HD23	2.03	0.41
3:E:294:SER:HB3	3:E:297:ASP:HB2	2.01	0.41
3:C:84:VAL:HG23	3:C:84:VAL:O	2.20	0.41
3:E:169:ARG:HA	3:E:183:ASN:OD1	2.20	0.41
3:F:246:GLU:HB2	3:F:249:GLN:HE22	1.84	0.41
1:J:37:DA:H1'	3:E:145:SER:CB	2.51	0.41
1:J:43:DG:H2''	1:J:44:DG:C8	2.56	0.41
3:C:34:ARG:NH1	5:H:24:DG:O6	2.53	0.41
6:I:6:DG:H2''	6:I:7:DA:C8	2.56	0.41
3:C:9:LYS:HA	3:C:76:ASP:OD2	2.21	0.41
2:D:58:MET:SD	2:D:71:LEU:HB2	2.60	0.41
6:I:7:DA:H2''	6:I:8:DA:C8	2.56	0.41
2:A:88:ILE:HG21	2:D:25:GLU:O	2.21	0.41
3:B:130:PHE:CZ	3:B:150:ARG:HD2	2.56	0.41
3:B:185:ALA:HB2	3:B:251:ILE:HD12	2.03	0.41
3:C:119:LEU:HA	3:C:140:MET:HE2	2.03	0.41
3:F:31:LYS:HG2	3:F:65:ASP:HB2	2.03	0.41
4:G:48:DG:H2''	4:G:49:DG:OP1	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:50:DG:H1'	4:G:51:DT:O4'	2.20	0.41
3:B:123:ARG:HD2	3:B:136:SER:O	2.20	0.41
3:F:233:ILE:HD11	3:F:271:ARG:HH12	1.85	0.41
3:B:190:HIS:HD1	5:H:28:DG:P	2.44	0.41
3:C:51:PRO:O	3:C:55:ILE:HG12	2.20	0.41
3:C:173:PRO:HG3	3:C:194:TYR:CE2	2.56	0.41
3:F:89:VAL:HG21	3:F:92:TYR:HE1	1.86	0.41
3:F:172:ASN:O	3:F:176:PHE:HB2	2.21	0.41
1:J:8:DG:H2'	1:J:9:DG:C5	2.56	0.41
3:F:83:TRP:HB2	3:F:91:TYR:HB3	2.02	0.41
3:C:90:ARG:HA	3:C:90:ARG:HH11	1.86	0.40
2:D:46:ARG:HH22	3:F:10:SER:HB3	1.86	0.40
3:F:23:THR:HB	3:F:260:ARG:NH1	2.36	0.40
5:H:29:DT:H2''	5:H:30:DT:O4'	2.21	0.40
3:F:60:LEU:HD12	3:F:60:LEU:HA	1.82	0.40
1:J:48:DC:H2''	1:J:49:DC:C5	2.56	0.40
2:D:59:CYS:SG	2:D:68:TYR:HB2	2.60	0.40
3:B:299:LYS:HG3	3:B:309:TYR:CE2	2.55	0.40
5:H:12:DT:H2''	5:H:13:DG:C8	2.56	0.40
3:C:34:ARG:O	4:G:3:DA:H3'	2.21	0.40
3:E:81:LEU:HD12	3:F:91:TYR:CE2	2.56	0.40
3:E:253:GLN:HE21	4:G:23:DT:P	2.44	0.40
5:H:5:DG:C2	5:H:6:DG:C5	3.10	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
2	A	91/289 (32%)	88 (97%)	3 (3%)	0	100 100
2	D	91/289 (32%)	91 (100%)	0	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	B	290/316 (92%)	279 (96%)	11 (4%)	0	100	100
3	C	276/316 (87%)	269 (98%)	7 (2%)	0	100	100
3	E	284/316 (90%)	268 (94%)	16 (6%)	0	100	100
3	F	279/316 (88%)	271 (97%)	8 (3%)	0	100	100
All	All	1311/1842 (71%)	1266 (97%)	45 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	A	80/245 (33%)	80 (100%)	0	100	100
2	D	80/245 (33%)	80 (100%)	0	100	100
3	B	238/258 (92%)	237 (100%)	1 (0%)	91	94
3	C	223/258 (86%)	222 (100%)	1 (0%)	91	94
3	E	234/258 (91%)	234 (100%)	0	100	100
3	F	226/258 (88%)	225 (100%)	1 (0%)	91	94
All	All	1081/1522 (71%)	1078 (100%)	3 (0%)	92	95

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	B	230	LYS
3	C	160	LYS
3	F	49	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
3	B	184	GLN

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Mol	Chain	Res	Type
3	B	198	HIS
3	C	190	HIS
3	E	87	GLN
3	F	87	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 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.

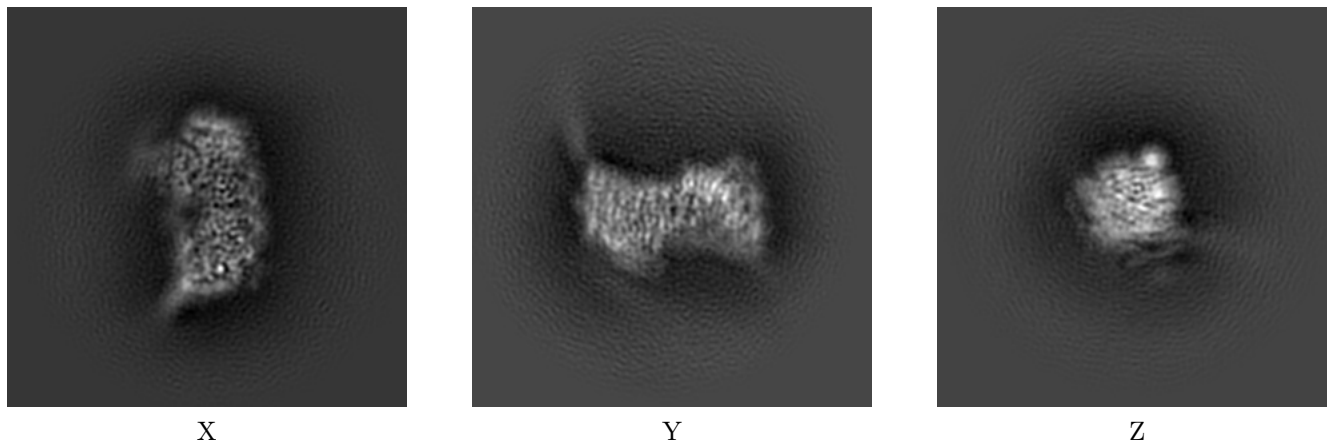
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29565. These allow visual inspection of the internal detail of the map and identification of artifacts.

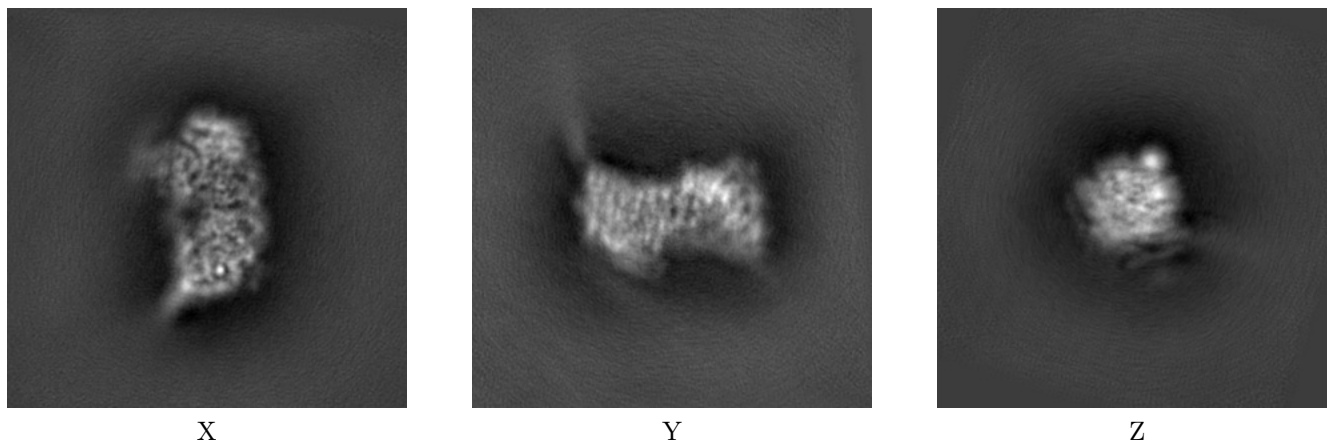
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

#### 6.1.1 Primary map



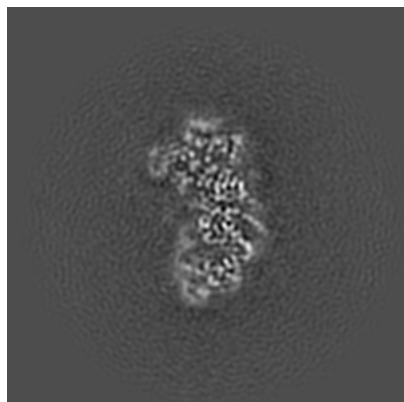
#### 6.1.2 Raw map



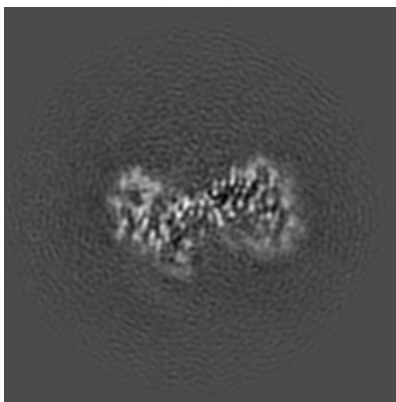
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

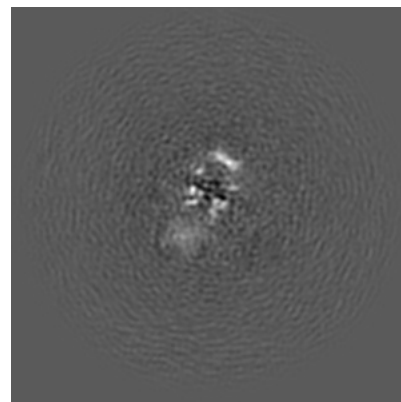
### 6.2.1 Primary map



X Index: 120

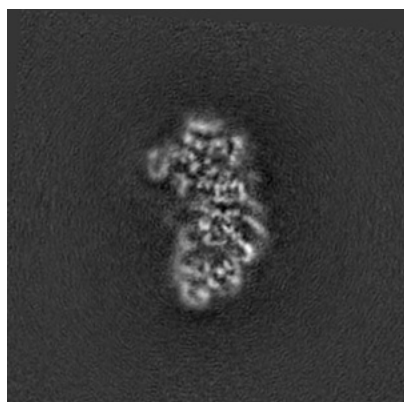


Y Index: 120

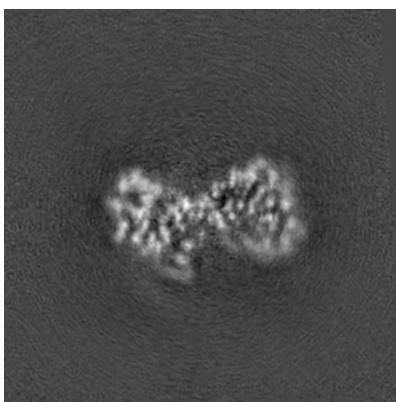


Z Index: 120

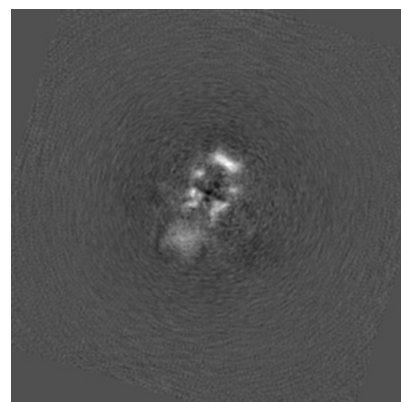
### 6.2.2 Raw map



X Index: 120



Y Index: 120



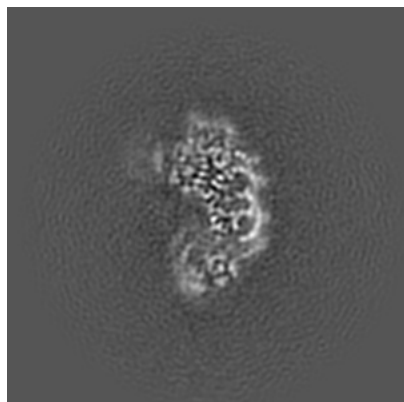
Z Index: 120

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

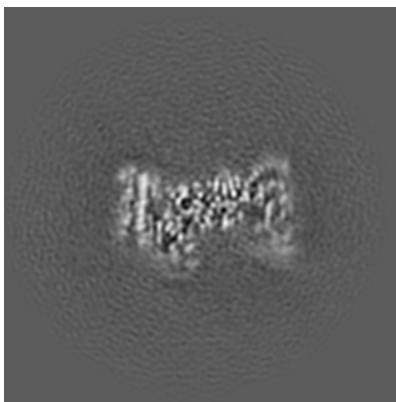


## 6.3 Largest variance slices [i](#)

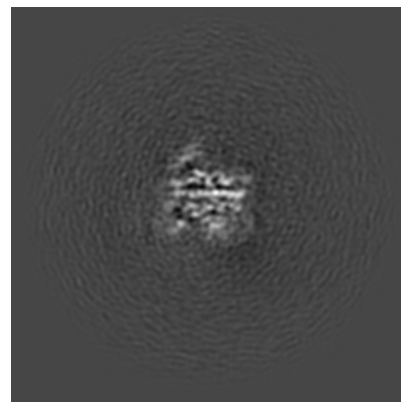
### 6.3.1 Primary map



X Index: 128

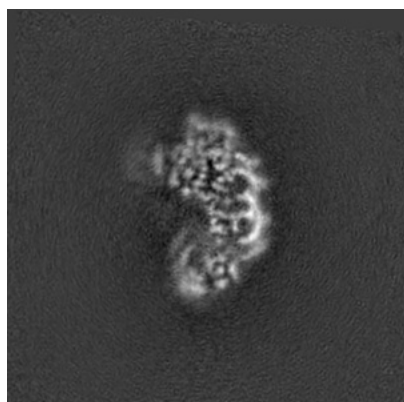


Y Index: 127

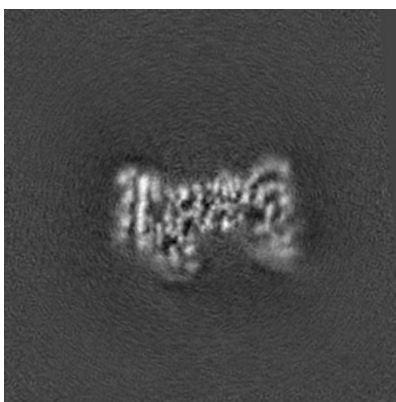


Z Index: 83

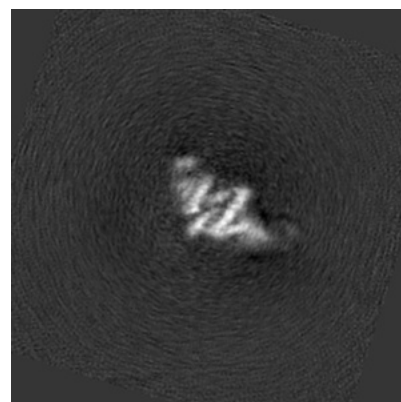
### 6.3.2 Raw map



X Index: 128



Y Index: 127

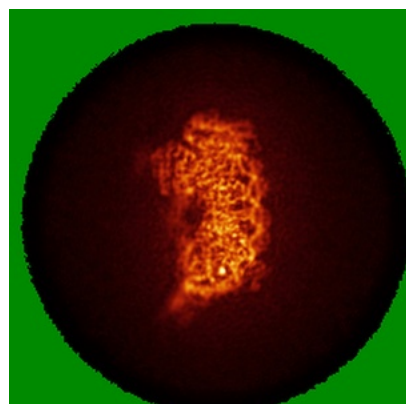


Z Index: 72

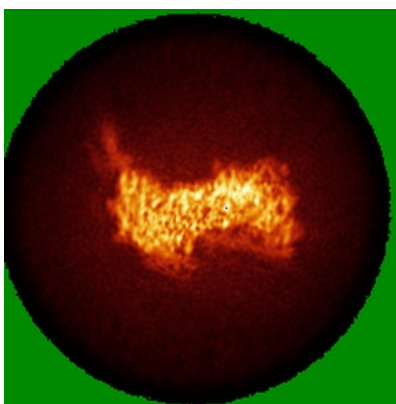
The images above show the largest variance slices of the map in three orthogonal directions.

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

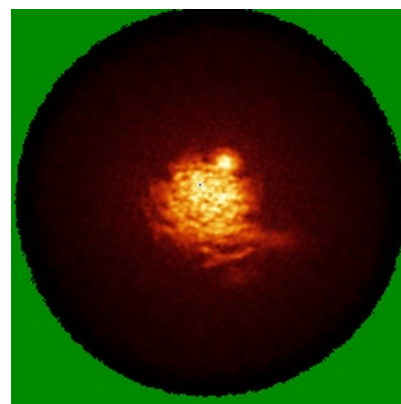
### 6.4.1 Primary map



X

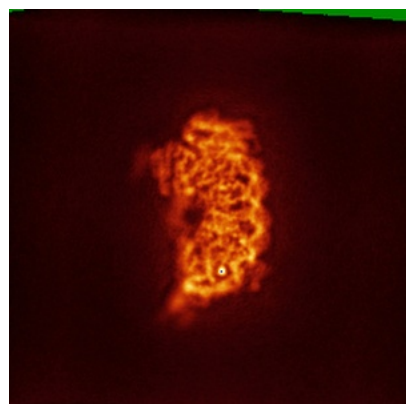


Y

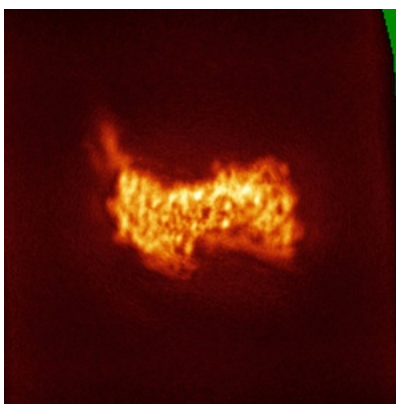


Z

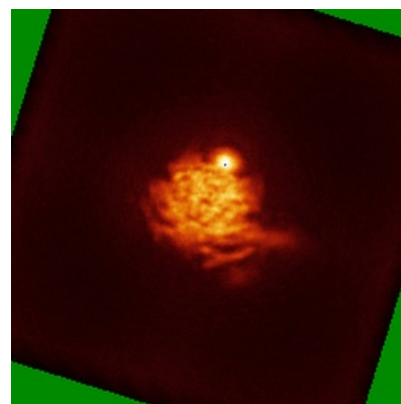
### 6.4.2 Raw map



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



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05. 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.

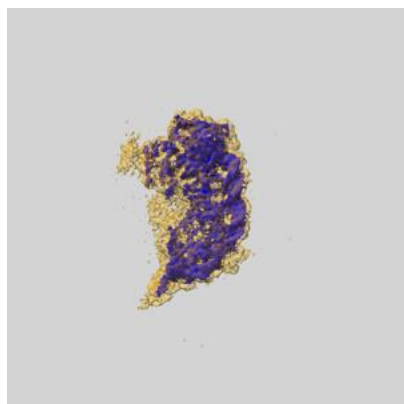
## 6.6 Mask visualisation [i](#)

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

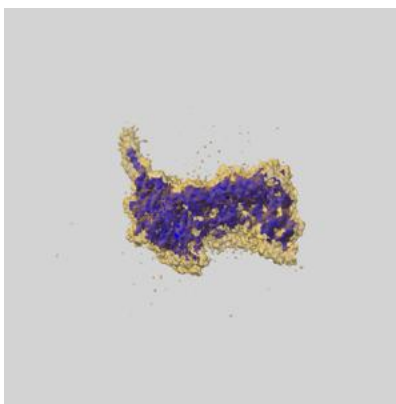
A mask typically either:

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

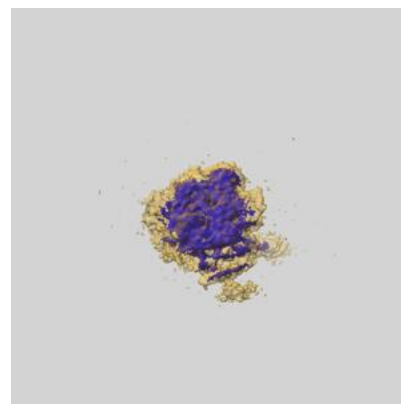
### 6.6.1 emd\_29565\_msk\_1.map [i](#)



X



Y

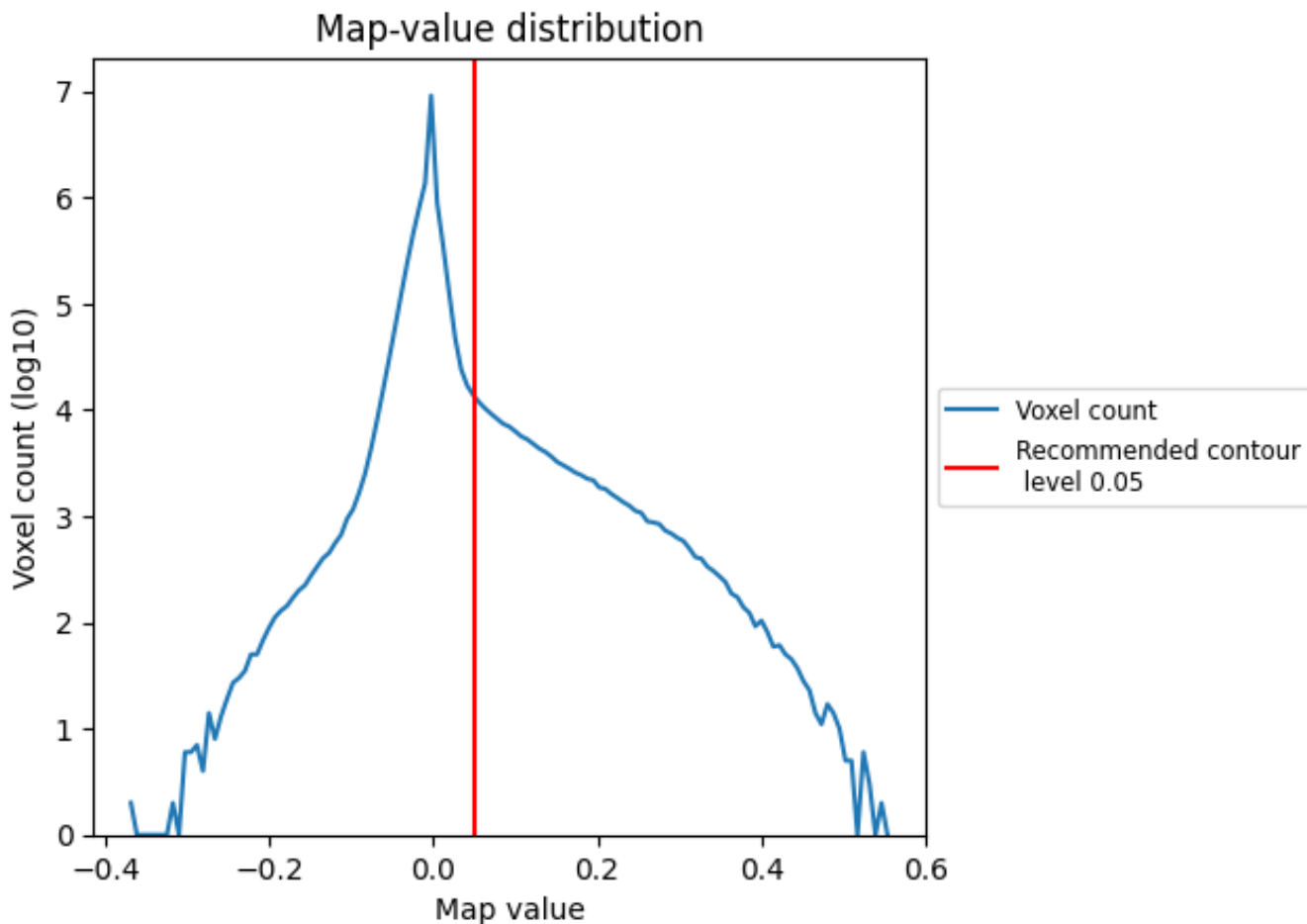


Z

## 7 Map analysis [i](#)

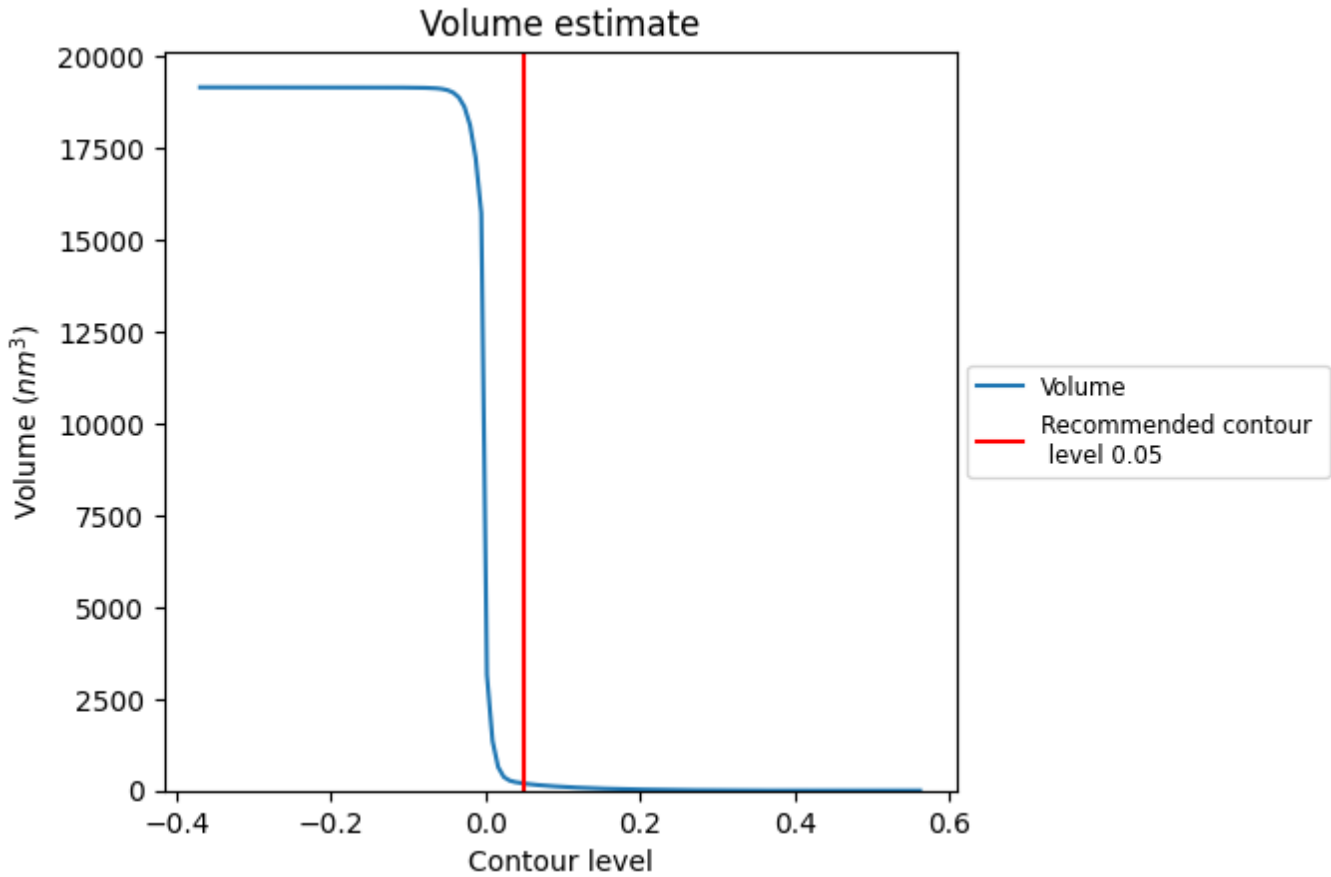
This section contains the results of statistical analysis of the map.

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



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

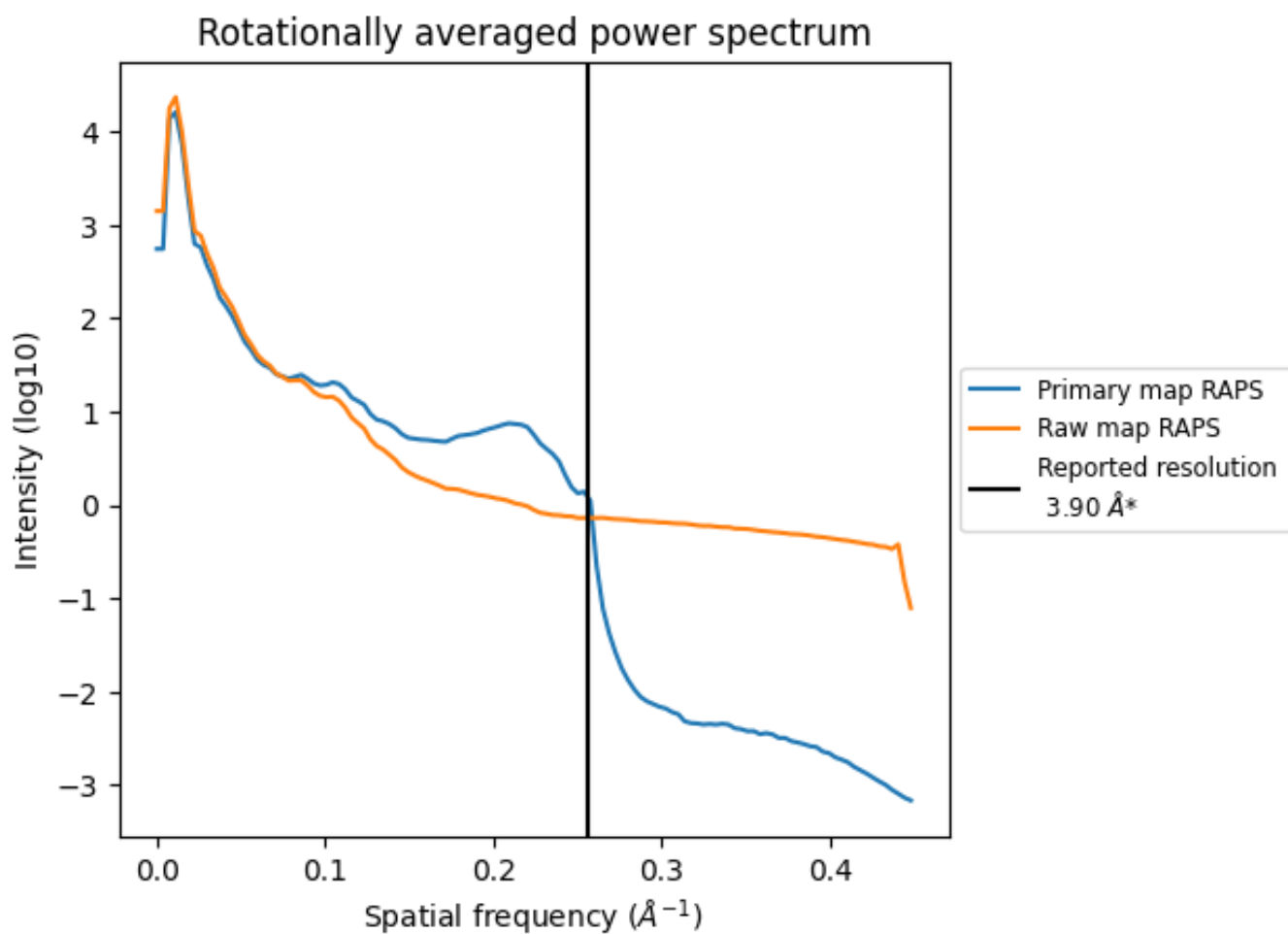
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 192 nm<sup>3</sup>; this corresponds to an approximate mass of 173 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

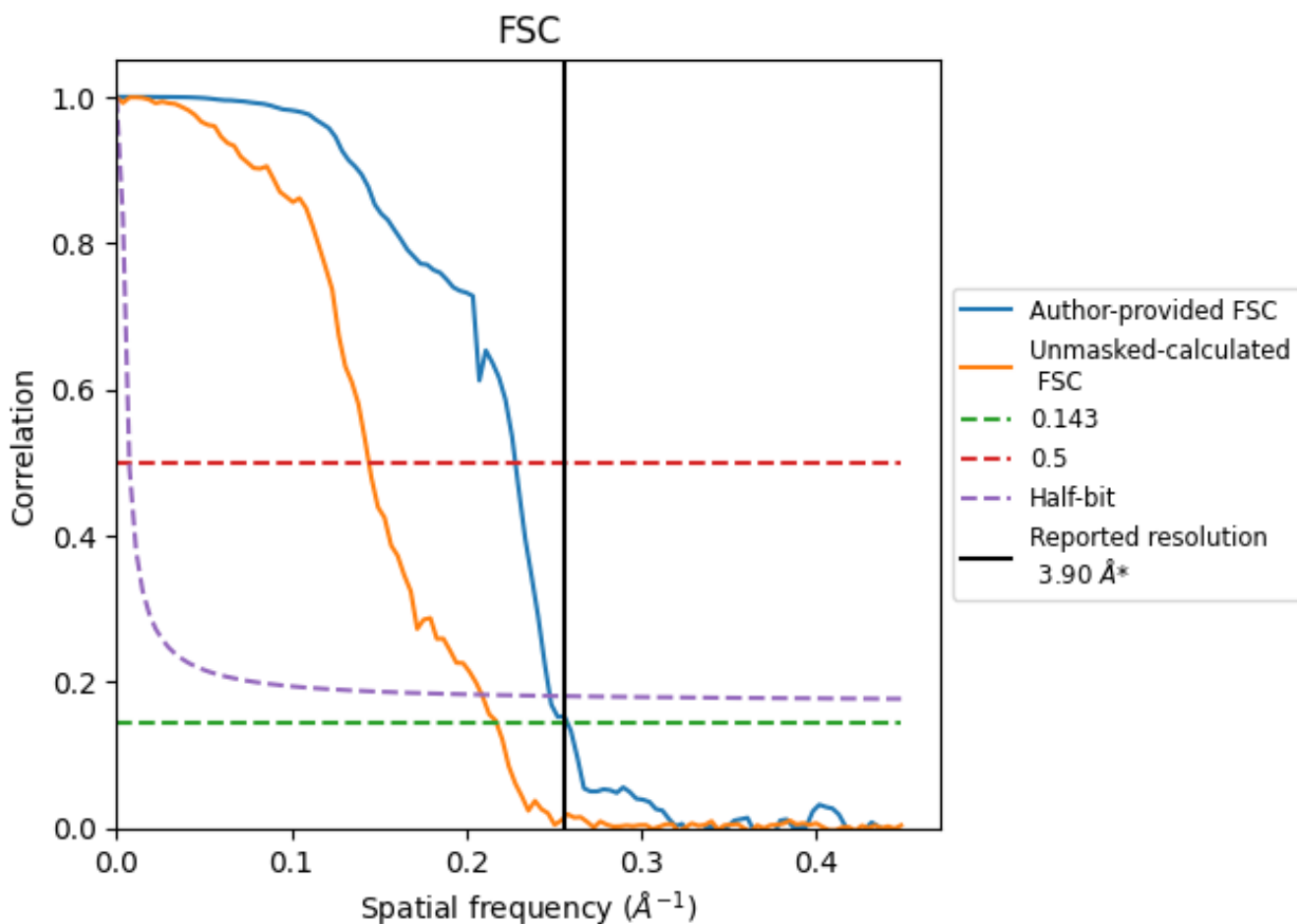


\*Reported resolution corresponds to spatial frequency of 0.256 Å<sup>-1</sup>

## 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 0.256 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

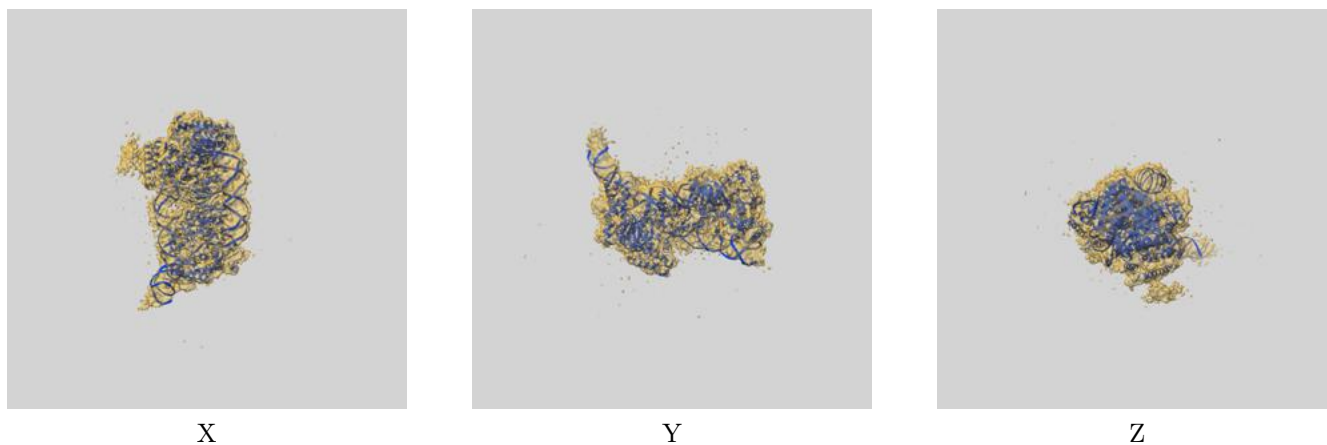
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.88	4.39	4.04
Unmasked-calculated*	4.60	6.93	4.79

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.60 differs from the reported value 3.9 by more than 10 %

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

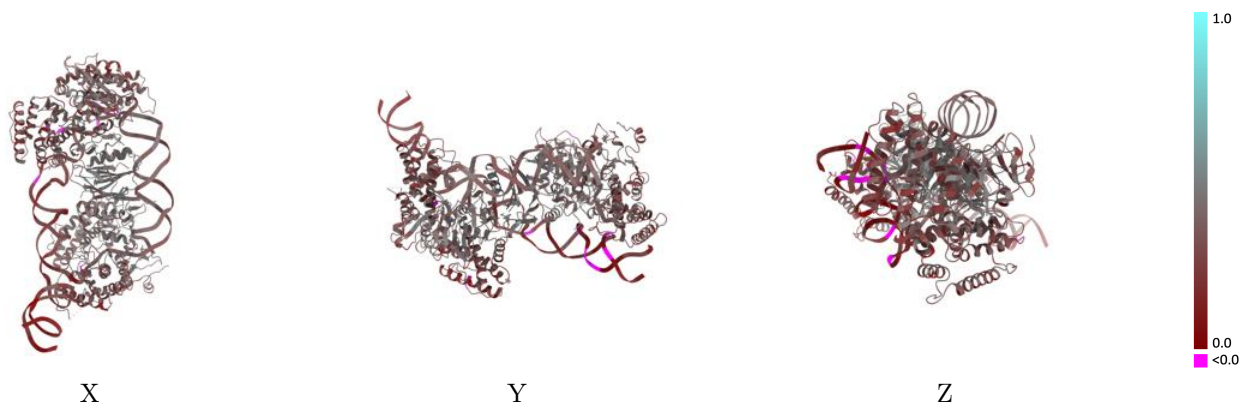
This section contains information regarding the fit between EMDB map EMD-29565 and PDB model 8FYD. Per-residue inclusion information can be found in section 3 on page 6.

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



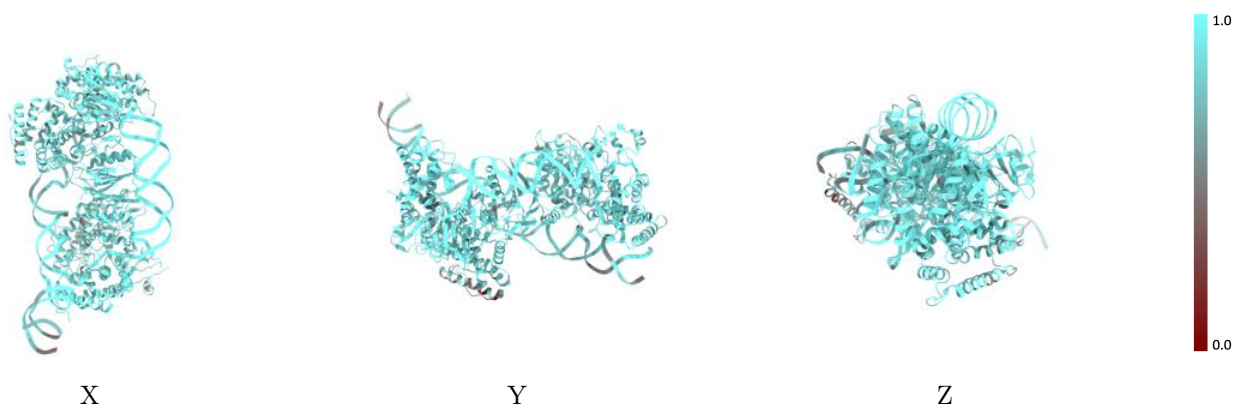
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



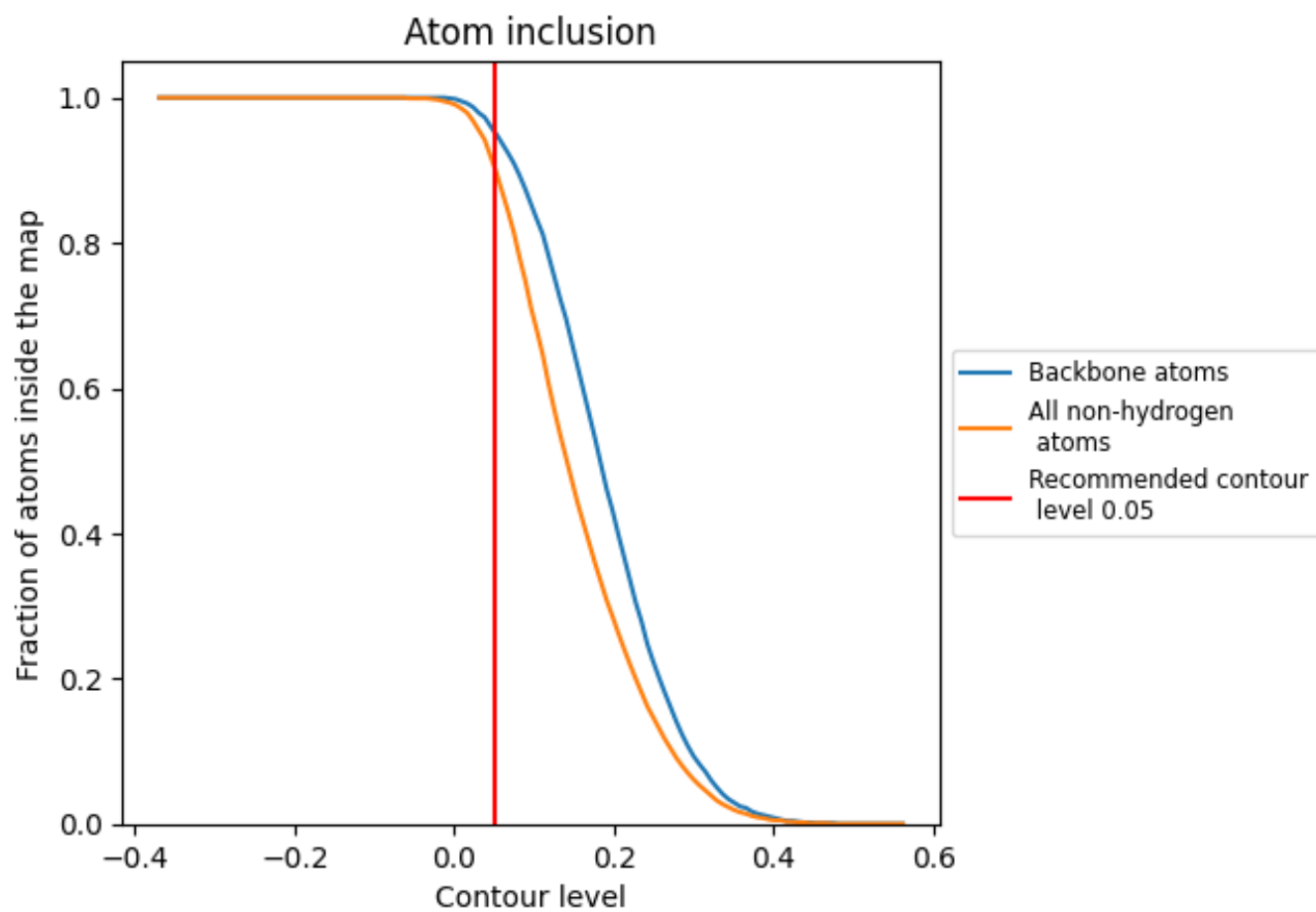
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.05).























## 9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 90% 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 (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9050	 0.3380
A	 0.9490	 0.4370
B	 0.9300	 0.3450
C	 0.9020	 0.3710
D	 0.9540	 0.4340
E	 0.9340	 0.3550
F	 0.8580	 0.3450
G	 0.8850	 0.2480
H	 0.9940	 0.3770
I	 0.7360	 0.1860
J	 0.8370	 0.1850

