



## Full wwPDB EM Validation Report ⓘ

Nov 4, 2024 – 09:00 AM EST

PDB ID : 7TYR  
EMDB ID : EMD-26192  
Title : Cryo-EM structure of the basal state of the Artemis:DNA-PKcs complex (see COMPND 13/14)  
Authors : Watanabe, G.; Lieber, M.R.; Williams, D.R.  
Deposited on : 2022-02-14  
Resolution : 3.33 Å (reported)  
Based on initial model : 5LUQ

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

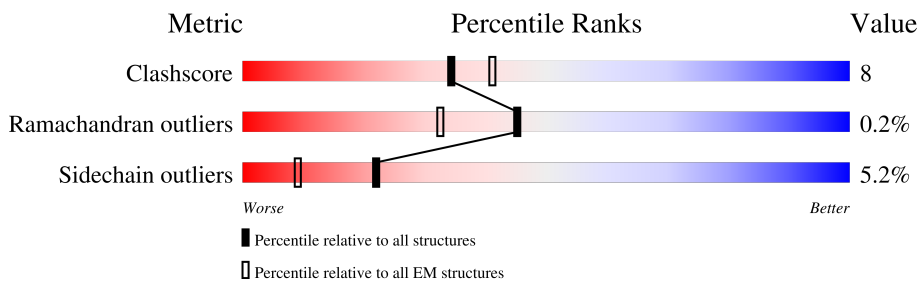
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.33 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	4128	
2	C	707	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 31610 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA-dependent protein kinase catalytic subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	3905	31173	19935	5272	5764	202	1	0

- Molecule 2 is a protein called Protein artemis.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	C	52	437	279	76	82	0	0

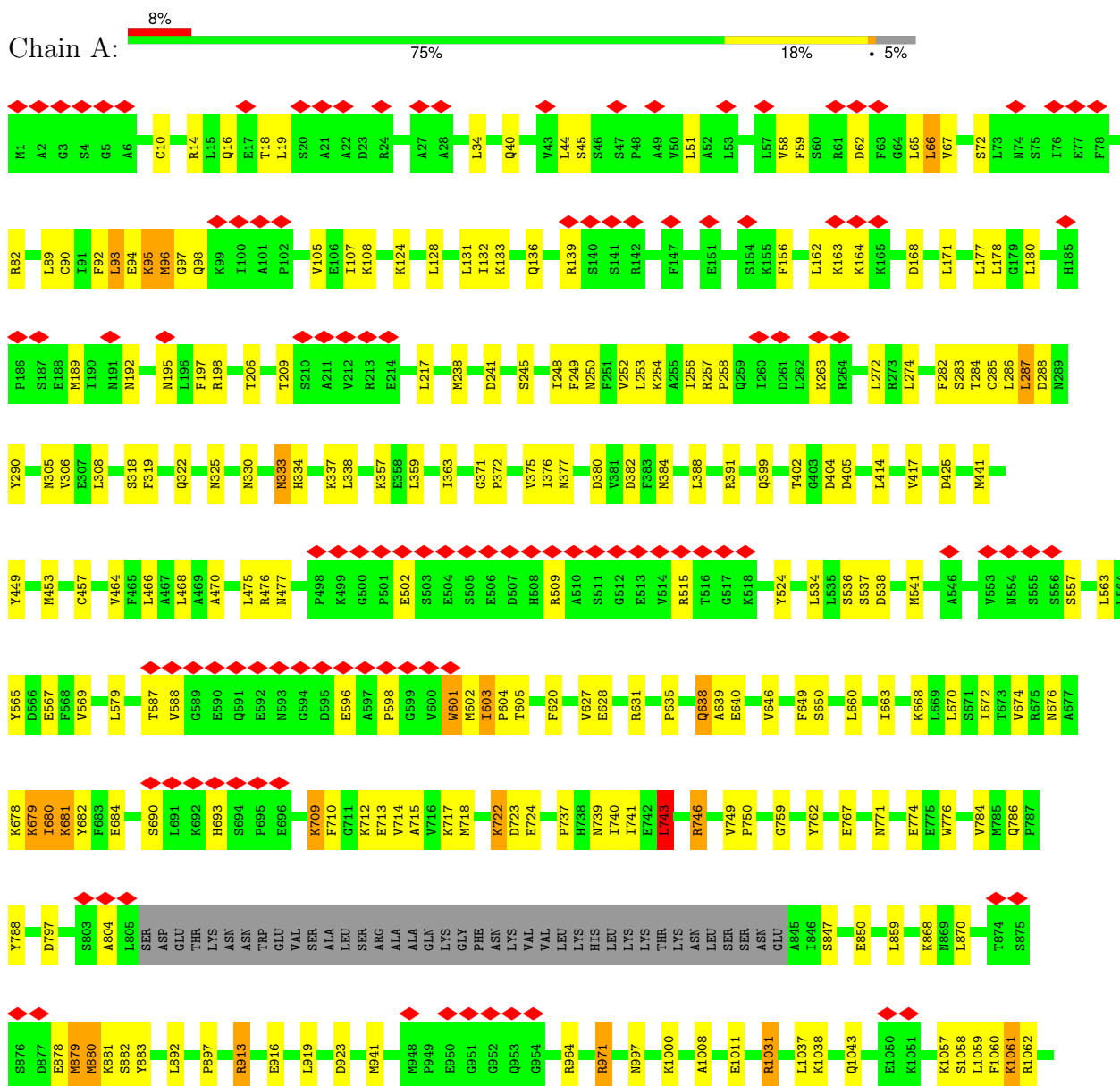
There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	693	GLU	-	expression tag	UNP Q96SD1
C	694	ASN	-	expression tag	UNP Q96SD1
C	695	LEU	-	expression tag	UNP Q96SD1
C	696	TYR	-	expression tag	UNP Q96SD1
C	697	PHE	-	expression tag	UNP Q96SD1
C	698	GLN	-	expression tag	UNP Q96SD1
C	699	GLY	-	expression tag	UNP Q96SD1
C	700	HIS	-	expression tag	UNP Q96SD1
C	701	HIS	-	expression tag	UNP Q96SD1
C	702	HIS	-	expression tag	UNP Q96SD1
C	703	HIS	-	expression tag	UNP Q96SD1
C	704	HIS	-	expression tag	UNP Q96SD1
C	705	HIS	-	expression tag	UNP Q96SD1
C	706	HIS	-	expression tag	UNP Q96SD1
C	707	HIS	-	expression tag	UNP Q96SD1

### 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-dependent protein kinase catalytic subunit





GLY	LEU	PRO	GLY	ASP	GLU	ASP	VAL	L2916	L2917	P2918	R2922	K2928	L2933	K3128	K2950	R2962	E2967	Q2971	P2986	K3009	S3010	L3012	Y3013	S3021	L3027	Y3036	Y3040	K3048	L3052	Q3059	S3060	L3062	D3066	K3067	M3069	E3072	K3075	E3085	L3091	L3098	Q3099	D3216						
E2760	A2761	K2762	H2763	K2764	Q2765	D2766	A2767	Q2768	V2769	V2770	L2771	Y2772	R2773	H2777	I2783	H2787	S2788	S2789	V2797	R2800	D2801	L2804	A2805	K2806	M2820	F2823	I2829	L2844	C2857	D2860	Q2864	S2870	Q2886	I2890	R2891	L2892	L2893	E2894	E2895	P2902	A2903	E2904	L2905	P2906	A2907	K2908	R2909	V2910
L3082	Q3093	R3098	Y3102	M3111	S3115	L3120	L3121	L3126	T3127	K3128	L3129	V3132	I3138	F3141	I3142	S3143	V3155	P3156	R3159	D3174	D3181	F3188	F3189	I3193	T3198	P3199	L3200	P3201	E3202	D3203	N3204	S3205	M3206	N3207	V3208	D3209	D3210	G3212	D3213	S3215	D3216							
R3217	M3218	E3219	V3220	Q3221	Q3222	Q3223	E3224	Q3249	K3260	D3271	V3274	Q3278	C3281	S3284	Q3296	V3297	L3298	T3299	V3300	L3501	K3302	M3310	N3311	V3312	S3313	L3316	D3325	Q3326	N3327	I3328	L3329	T3332	T3333	R3335	C3347	I3351	E3352	S3353	D3354	L3362	K3372							
A3388	E3395	A3396	Q3397	P3398	P3399	S3400	M3401	S3402	C3403	C3404	P3405	D3411	A3412	T3415	L3416	R3425	A3431	S3432	V3433	L3434	D3435	K3449	K3450	L3451	K3452	M3459	L3463	P3466	L3469	T3479	E3486	I3487	V3512	Q3515	E3520	M3524	Q3527	V3530	K3550									
E3563	R3557	K3561	L3562	P3581	L3584	M3588	L3596	A3597	K3598	T3599	P3600	V3601	M3602	K3603	N3604	N3605	I3606	E3607	K3608	M3609	V3610	E3611	M3612	M3613	Y3614	A3615	A3616	L3617	F3636	C3637	F3640	D3641	K3642	K3646	L3652	R3653	M3654	K3655	L3656	F3659	I3662	T3663	M3664	L3667	L3668			
N3671	K3672	D3673	S3674	K3675	R3696	Y3705	D3706	C3707	R3708	G3709	K3710	P3711	L3712	P3713	E3714	Y3715	H3716	R3763	S3782	R3799	L3800	M3808	L3817	M3820	S3821	E3824	K3825	A3826	Y3828	L3829	S3830	D3831	P3835	P3836	C3837	E3838	L3843	S3847	M3858	N3863	R3864	S3876	K3877					
D3881	L3882	L3883	A3886	M3890	M3916	H3944	L3958	L3970	M3971	L3972	P3973	S3982	R3992	L3997	L3998	M4002	D4003	V4004	F4005	V4006	K4007	K4014	E4017	M4020	L4021	E4030	I4031	M4032	V4033	A4034	P4040	I4044	L4051	L4064	L4065	F4074	Y4077											
K4085	A4091	Q4103	L4107	W4124	M4128																																											

● Molecule 2: Protein artemis

Chain C:  93%

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



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	103485	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60.0	Depositor
Minimum defocus (nm)	750	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	46296	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.449	Depositor
Minimum map value	-1.114	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.3	Depositor
Map size (Å)	552.96, 552.96, 552.96	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	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	A	0.29	0/31831	0.51	0/43042
2	C	0.56	0/452	0.67	0/614
All	All	0.29	0/32283	0.51	0/43656

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts i

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	31173	0	31434	479	0
2	C	437	0	424	35	0
All	All	31610	0	31858	501	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 8.

All (501) 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:C:381:VAL:HG13	2:C:382:HIS:ND1	1.35	1.35
2:C:381:VAL:CG1	2:C:382:HIS:ND1	2.17	1.07

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:365:THR:HG23	2:C:367:PRO:HD2	1.38	1.03
1:A:2911:ARG:CZ	1:A:2913:LYS:HE3	1.93	0.98
2:C:369:TYR:HB2	2:C:371:PRO:HD3	1.51	0.92
2:C:381:VAL:HG13	2:C:382:HIS:CE1	2.10	0.85
1:A:2911:ARG:NH2	1:A:2913:LYS:HE3	1.91	0.85
2:C:402:ARG:H	2:C:402:ARG:HD3	1.43	0.84
2:C:366:GLU:HG2	2:C:367:PRO:HD3	1.61	0.83
1:A:2161:ALA:C	1:A:2163:HIS:H	1.81	0.82
1:A:90:CYS:HA	1:A:93:LEU:HD23	1.62	0.81
1:A:3827:ALA:O	1:A:3831:ASP:HB3	1.80	0.81
1:A:1212:LEU:HD21	1:A:1220:LEU:HD22	1.61	0.81
1:A:284:THR:HA	1:A:287:LEU:HB2	1.62	0.81
1:A:1529:VAL:HG21	1:A:1581:GLU:HG2	1.67	0.76
1:A:3093:GLN:HA	2:C:377:ARG:HD2	1.68	0.76
1:A:746:ARG:HG2	1:A:788:TYR:HE1	1.52	0.74
1:A:3010:SER:HA	2:C:402:ARG:HD2	1.69	0.74
1:A:2911:ARG:NH1	1:A:2913:LYS:HE3	2.05	0.72
1:A:1057:LYS:HG3	1:A:1061:LYS:HD3	1.72	0.71
1:A:2341:LEU:HD21	1:A:2371:PHE:CE2	2.28	0.69
1:A:2097:LEU:HD11	1:A:2149:LEU:HD11	1.75	0.68
1:A:305:ASN:OD1	1:A:306:VAL:N	2.27	0.68
2:C:402:ARG:HD3	2:C:402:ARG:N	2.06	0.68
1:A:1212:LEU:HD11	1:A:1220:LEU:HB2	1.73	0.68
1:A:1206:LEU:HD23	1:A:1209:LYS:HZ3	1.59	0.66
1:A:3098:ARG:HH21	2:C:368:LYS:HG3	1.59	0.66
1:A:596:GLU:HG3	1:A:598:PRO:HD2	1.77	0.66
1:A:1773:VAL:HG13	1:A:1774:MET:HG3	1.76	0.66
1:A:680:ILE:O	1:A:681:LYS:HB2	1.95	0.66
1:A:2161:ALA:O	1:A:2163:HIS:N	2.28	0.66
1:A:89:LEU:HD21	1:A:107:ILE:HD12	1.78	0.66
1:A:1750:LEU:HD12	1:A:1762:MET:HG3	1.77	0.66
1:A:3520:GLU:O	1:A:3524:ASN:ND2	2.27	0.66
1:A:2911:ARG:CZ	1:A:2913:LYS:CE	2.71	0.65
1:A:163:LYS:HZ3	1:A:171:LEU:HD21	1.62	0.64
1:A:881:LYS:C	1:A:883:TYR:H	2.02	0.64
1:A:3944:HIS:NE2	1:A:4020:MET:SD	2.70	0.64
1:A:923:ASP:OD2	1:A:2800:ARG:NH1	2.31	0.63
1:A:3138:ILE:HD13	1:A:3189:PHE:HZ	1.62	0.63
1:A:1749:ALA:O	1:A:1753:SER:HB2	1.99	0.63
1:A:797:ASP:HB2	1:A:870:LEU:HG	1.80	0.63
1:A:1528:LEU:HD21	1:A:1567:ILE:HG23	1.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1169:VAL:HA	1:A:1172:LEU:HD12	1.81	0.62
1:A:1945:TYR:HE1	1:A:1971:PRO:HB3	1.65	0.61
1:A:1134:LEU:O	1:A:1138:ILE:HD12	1.99	0.61
1:A:1977:ILE:HG13	1:A:1979:GLU:H	1.64	0.61
1:A:45:SER:HB2	1:A:51:LEU:HD11	1.82	0.61
1:A:189:MET:SD	1:A:192:ASN:ND2	2.72	0.61
1:A:3085:GLU:OE1	1:A:3085:GLU:N	2.32	0.61
1:A:2911:ARG:NH2	1:A:2913:LYS:CE	2.64	0.60
1:A:2894:GLU:HB3	1:A:3973:PRO:HG3	1.83	0.60
1:A:1211:VAL:O	1:A:1214:GLU:HG3	2.02	0.60
1:A:2915:ARG:NH2	1:A:2918:PRO:HD3	2.17	0.60
1:A:880:MET:O	1:A:883:TYR:HB2	2.02	0.60
1:A:3093:GLN:HA	2:C:377:ARG:CD	2.32	0.60
1:A:3636:PHE:HZ	1:A:3668:LEU:HB3	1.67	0.60
2:C:381:VAL:CG1	2:C:382:HIS:CE1	2.79	0.59
1:A:997:ASN:OD1	1:A:1043:GLN:NE2	2.35	0.59
1:A:2165:LEU:HA	1:A:2193:ILE:HD11	1.83	0.59
1:A:2173:ALA:HB2	1:A:2215:LEU:HB2	1.84	0.59
1:A:2160:TYR:O	1:A:2163:HIS:HB2	2.01	0.59
1:A:2393:LEU:HA	1:A:2396:LEU:HD12	1.85	0.59
1:A:414:LEU:HG	1:A:464:VAL:HG21	1.84	0.59
1:A:1532:LEU:HD11	1:A:1567:ILE:HG21	1.84	0.59
1:A:1905:ILE:HG23	1:A:1906:THR:HG23	1.85	0.59
1:A:1097:GLU:O	1:A:1151:ARG:NH1	2.35	0.59
1:A:2322:VAL:HA	1:A:2325:LEU:HD12	1.84	0.59
1:A:2820:MET:HE2	1:A:2832:ILE:HD13	1.85	0.59
1:A:3588:TRP:NE1	1:A:3609:MET:SD	2.74	0.58
2:C:365:THR:CG2	2:C:367:PRO:HD2	2.25	0.58
1:A:1529:VAL:CG2	1:A:1581:GLU:HG2	2.34	0.58
1:A:333:MET:SD	1:A:333:MET:N	2.74	0.58
1:A:1828:LEU:HB3	1:A:1879:VAL:HG11	1.85	0.58
1:A:2123:PRO:HG2	1:A:2126:MET:HB2	1.85	0.58
1:A:2156:VAL:O	1:A:2159:PRO:HD2	2.03	0.58
1:A:3599:THR:C	1:A:3601:VAL:N	2.56	0.57
1:A:3817:LEU:HD22	1:A:3825:LYS:HD2	1.86	0.57
1:A:72:SER:O	1:A:82:ARG:NH1	2.37	0.57
1:A:1153:LEU:HD11	1:A:1159:PRO:HA	1.87	0.57
1:A:2470:ARG:NH1	1:A:2512:ASP:OD1	2.38	0.57
1:A:3828:TYR:HD1	1:A:3829:LEU:HD23	1.69	0.57
1:A:3411:ASP:O	1:A:3415:THR:OG1	2.23	0.57
1:A:3527:GLN:HA	1:A:3530:VAL:HG12	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2155:GLU:O	1:A:2159:PRO:HD3	2.04	0.57
1:A:749:VAL:HB	1:A:750:PRO:HD3	1.86	0.57
1:A:1606:ARG:HB2	1:A:2042:GLN:HE22	1.70	0.57
1:A:1945:TYR:CE1	1:A:1971:PRO:HB3	2.39	0.57
1:A:1859:ASN:ND2	1:A:1861:SER:OG	2.38	0.57
1:A:217:LEU:HD22	1:A:263:LYS:HG2	1.87	0.56
1:A:1241:LEU:HG	1:A:1296:PHE:CE1	2.41	0.56
1:A:3021:SER:HB3	2:C:408:PRO:HG3	1.86	0.56
1:A:2890:ILE:O	1:A:2894:GLU:HG3	2.05	0.56
1:A:2313:LYS:HB3	1:A:2314:GLU:OE1	2.05	0.56
1:A:3066:ASP:OD1	1:A:3067:LYS:N	2.39	0.56
1:A:95:LYS:HG3	1:A:96:MET:N	2.20	0.56
1:A:3351:ILE:HD12	1:A:3352:GLU:H	1.70	0.56
1:A:3466:PRO:HA	1:A:3469:LEU:HD12	1.88	0.56
1:A:2326:ILE:O	1:A:2330:VAL:HG13	2.06	0.56
1:A:1442:GLN:OE1	1:A:1445:ARG:NH2	2.38	0.56
1:A:681:LYS:O	1:A:684:GLU:HG2	2.05	0.56
1:A:2171:LEU:O	1:A:2177:ASN:ND2	2.39	0.56
2:C:365:THR:HG23	2:C:367:PRO:CD	2.23	0.56
1:A:3817:LEU:HD21	1:A:3829:LEU:HD21	1.86	0.56
2:C:378:ALA:O	2:C:379:ARG:HB2	2.06	0.56
1:A:2361:ILE:HD11	1:A:2382:VAL:HG22	1.87	0.55
1:A:1071:ASN:HB3	1:A:1074:LYS:HG3	1.88	0.55
1:A:1081:ALA:O	1:A:1085:ILE:HG13	2.07	0.55
1:A:3048:LYS:HD3	1:A:3061:LEU:HB2	1.88	0.55
1:A:206:THR:O	1:A:209:THR:OG1	2.22	0.55
1:A:1851:LEU:O	1:A:1870:LYS:NZ	2.35	0.55
1:A:2323:LEU:HB3	1:A:2344:LEU:HD11	1.88	0.55
1:A:3013:TYR:CD2	2:C:402:ARG:HG2	2.41	0.55
1:A:3883:LEU:HD13	1:A:3970:LEU:HD22	1.89	0.55
1:A:515:ARG:NH1	1:A:2057:GLN:OE1	2.40	0.55
1:A:603:ILE:HD13	1:A:1031:ARG:HG2	1.89	0.55
1:A:2891:ARG:O	1:A:2895:GLU:HG2	2.07	0.55
1:A:2154:GLU:HA	1:A:2157:PHE:HD2	1.72	0.55
1:A:1424:THR:HG22	1:A:1426:GLN:H	1.71	0.54
1:A:1487:VAL:HG11	1:A:1515:LEU:HD13	1.89	0.54
1:A:2482:ASP:O	1:A:2485:ARG:HG2	2.07	0.54
1:A:2143:ARG:HE	1:A:2171:LEU:HD13	1.73	0.54
1:A:1208:LEU:O	1:A:1212:LEU:HB2	2.07	0.54
1:A:538:ASP:N	1:A:538:ASP:OD1	2.36	0.54
1:A:670:LEU:O	1:A:674:VAL:HG23	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3174:ASP:O	1:A:3249:GLN:NE2	2.38	0.54
1:A:2950:LYS:HE2	1:A:2986:PRO:HG3	1.89	0.54
1:A:4017:GLU:O	1:A:4021:LEU:HB2	2.08	0.54
1:A:2087:GLU:OE2	1:A:2087:GLU:N	2.40	0.54
1:A:565:TYR:O	1:A:569:VAL:HG23	2.08	0.53
1:A:1397:ASP:O	1:A:1401:ASN:ND2	2.34	0.53
1:A:1696:LEU:HD11	1:A:1710:LEU:HD11	1.89	0.53
1:A:1837:ARG:NH1	1:A:1888:ASP:OD2	2.41	0.53
1:A:3835:PRO:N	1:A:3836:PRO:HD2	2.23	0.53
1:A:156:PHE:HB3	1:A:178:LEU:HD11	1.90	0.53
1:A:252:VAL:HG21	1:A:274:LEU:HD22	1.89	0.53
1:A:3763:ARG:HH22	1:A:4004:VAL:HG12	1.72	0.53
1:A:3300:VAL:HB	1:A:3333:THR:HG23	1.91	0.53
1:A:1493:PRO:HD2	1:A:1538:LEU:HD23	1.91	0.53
1:A:2104:MET:HA	1:A:2108:LEU:HD23	1.89	0.53
1:A:3667:LEU:O	1:A:3671:ASN:ND2	2.42	0.53
1:A:868:LYS:HG2	1:A:3126:LEU:HD11	1.91	0.52
1:A:2159:PRO:O	1:A:2160:TYR:HB2	2.09	0.52
1:A:1234:GLY:HA2	1:A:1259:LEU:HD13	1.91	0.52
1:A:1102:GLU:HA	1:A:1154:PRO:HB3	1.92	0.52
1:A:286:LEU:HD23	1:A:287:LEU:H	1.74	0.52
1:A:476:ARG:HE	1:A:563:LEU:HD11	1.75	0.52
1:A:131:LEU:HD23	1:A:177:LEU:HD21	1.92	0.52
1:A:3838:GLU:OE1	1:A:3877:LYS:NZ	2.40	0.52
1:A:2123:PRO:HD3	1:A:2160:TYR:CZ	2.45	0.52
1:A:252:VAL:O	1:A:256:ILE:HG12	2.10	0.52
1:A:635:PRO:HA	1:A:676:ASN:HD21	1.75	0.52
1:A:3091:LEU:HD21	1:A:3141:PHE:HE2	1.75	0.51
1:A:1212:LEU:O	1:A:1216:GLY:N	2.43	0.51
1:A:1855:PHE:HE1	1:A:1870:LYS:HE3	1.76	0.51
1:A:1057:LYS:HD3	1:A:1099:PHE:HZ	1.74	0.51
1:A:3668:LEU:O	1:A:3672:LYS:HB2	2.11	0.51
1:A:1154:PRO:HD3	1:A:1163:LEU:HD21	1.92	0.51
1:A:3883:LEU:HB3	1:A:3970:LEU:HD13	1.92	0.51
1:A:238:MET:HA	1:A:241:ASP:HB3	1.92	0.51
1:A:879:MET:HE3	1:A:3120:LEU:HG	1.92	0.51
1:A:2806:LYS:HG3	1:A:2857:CYS:HB2	1.91	0.51
1:A:3581:PRO:HA	1:A:3584:LEU:HD12	1.92	0.51
1:A:14:ARG:HD3	1:A:34:LEU:HD21	1.92	0.51
1:A:162:LEU:HD23	1:A:164:LYS:H	1.76	0.51
1:A:3553:GLU:O	1:A:3557:ARG:HG3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:859:LEU:HD21	1:A:870:LEU:HD13	1.93	0.51
1:A:2517:LEU:HA	1:A:2520:ILE:HG13	1.92	0.51
2:C:376:LYS:H	2:C:377:ARG:HH21	1.58	0.50
1:A:746:ARG:HG2	1:A:788:TYR:CE1	2.39	0.50
1:A:3069:MET:HA	1:A:3075:LYS:HB2	1.91	0.50
1:A:3296:GLN:O	1:A:3300:VAL:HG22	2.11	0.50
2:C:364:SER:O	2:C:365:THR:HG22	2.11	0.50
1:A:1059:LEU:HA	1:A:1062:ARG:HD2	1.93	0.50
1:A:1407:LYS:HD3	1:A:1463:LEU:HD21	1.94	0.50
1:A:2341:LEU:HD21	1:A:2371:PHE:HE2	1.74	0.50
1:A:1448:LEU:HD21	1:A:1514:LEU:HD11	1.93	0.50
1:A:2057:GLN:HG3	1:A:2059:PRO:HD2	1.93	0.50
1:A:2459:VAL:HG21	1:A:2501:LEU:HD21	1.94	0.50
1:A:3705:TYR:HD1	1:A:3712:LEU:HD13	1.75	0.50
1:A:16:GLN:NE2	1:A:62:ASP:O	2.42	0.50
1:A:249:PHE:CZ	1:A:253:LEU:HD13	2.46	0.50
1:A:3992:ARG:NH1	1:A:4103:GLN:OE1	2.45	0.50
1:A:470:ALA:HB1	1:A:1546:SER:HB2	1.93	0.50
1:A:2158:ARG:O	1:A:2161:ALA:HB2	2.10	0.50
1:A:2350:LYS:HG3	1:A:2351:GLN:N	2.27	0.50
1:A:93:LEU:HD21	1:A:133:LYS:CB	2.42	0.50
1:A:3637:GLY:HA2	1:A:3640:PHE:CZ	2.47	0.50
2:C:376:LYS:H	2:C:377:ARG:NH2	2.09	0.50
1:A:1675:TYR:OH	1:A:1692:ALA:O	2.24	0.50
1:A:1972:GLU:HB3	1:A:2142:ILE:HD12	1.94	0.50
1:A:2105:HIS:CE1	1:A:2156:VAL:HA	2.46	0.50
1:A:2327:LEU:O	1:A:2330:VAL:HG22	2.11	0.50
1:A:2797:VAL:HG13	1:A:2804:ILE:HG21	1.93	0.50
1:A:4085:LYS:NZ	1:A:4091:ALA:O	2.45	0.50
1:A:668:LYS:O	1:A:672:ILE:HG13	2.12	0.49
1:A:1508:LYS:HE2	1:A:1562:LEU:HD22	1.94	0.49
1:A:2348:GLN:HG3	1:A:2360:PHE:CE1	2.47	0.49
1:A:3012:GLU:OE2	1:A:3048:LYS:NZ	2.44	0.49
1:A:3313:SER:HA	1:A:3316:LEU:HD12	1.93	0.49
1:A:168:ASP:OD1	1:A:168:ASP:N	2.45	0.49
1:A:363:ILE:HG12	1:A:388:LEU:HD11	1.94	0.49
1:A:1164:CYS:SG	1:A:1165:LEU:N	2.86	0.49
1:A:4065:LEU:HA	1:A:4074:PHE:HE2	1.77	0.49
1:A:380:ASP:O	1:A:384:MET:HG3	2.12	0.49
1:A:2150:VAL:HG11	1:A:2168:LEU:HD11	1.94	0.49
1:A:3062:LEU:HD22	1:A:3093:GLN:HE21	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3886:ALA:O	1:A:3890:MET:HG3	2.13	0.49
2:C:377:ARG:H	2:C:377:ARG:NE	2.11	0.49
1:A:557:SER:HB3	1:A:1545:SER:H	1.78	0.49
1:A:1696:LEU:HD21	1:A:1714:LEU:HD21	1.94	0.49
1:A:1938:ARG:CZ	1:A:1938:ARG:HB3	2.41	0.49
1:A:3612:ARG:HH11	1:A:3799:ARG:HH12	1.61	0.49
2:C:374:LYS:HD2	2:C:376:LYS:HZ1	1.77	0.49
1:A:2567:SER:HA	1:A:2572:TYR:CG	2.48	0.49
1:A:3998:LEU:O	1:A:4002:MET:HG3	2.13	0.49
1:A:58:VAL:HG13	1:A:65:LEU:HD23	1.95	0.48
1:A:881:LYS:C	1:A:883:TYR:N	2.66	0.48
1:A:1213:LYS:HD2	1:A:1213:LYS:HA	1.46	0.48
1:A:1528:LEU:HD12	1:A:1531:LEU:HD11	1.94	0.48
1:A:2886:GLN:HB2	1:A:2933:ILE:HD13	1.95	0.48
1:A:3328:ILE:HD11	1:A:3412:ALA:HB2	1.94	0.48
1:A:3713:PRO:O	1:A:3714:GLU:HB3	2.12	0.48
1:A:892:LEU:HD11	1:A:941:MET:HG3	1.94	0.48
1:A:2402:LEU:HD13	1:A:2438:ILE:HG13	1.94	0.48
1:A:746:ARG:HH21	1:A:749:VAL:HG11	1.78	0.48
1:A:1849:ASP:HA	1:A:1852:LYS:HG2	1.95	0.48
1:A:2481:HIS:CE1	1:A:2485:ARG:HH21	2.31	0.48
1:A:3613:MET:O	1:A:3617:LEU:N	2.35	0.48
1:A:1984:LEU:HD22	1:A:2185:MET:HB2	1.95	0.48
1:A:2893:LEU:HD22	1:A:2922:ARG:HG2	1.95	0.48
2:C:377:ARG:CD	2:C:377:ARG:H	2.26	0.48
1:A:601:TRP:HE3	1:A:602:MET:H	1.61	0.48
1:A:2161:ALA:C	1:A:2163:HIS:N	2.49	0.48
1:A:4006:VAL:HG11	1:A:4044:ILE:HB	1.96	0.48
1:A:1794:GLN:OE1	1:A:1832:SER:OG	2.27	0.48
1:A:2474:TYR:HD1	1:A:2477:LEU:HD12	1.79	0.48
1:A:3599:THR:O	1:A:3600:PRO:C	2.50	0.48
1:A:767:GLU:HG3	1:A:771:ASN:HD21	1.78	0.48
1:A:3916:TRP:CE2	1:A:4107:LEU:HD21	2.48	0.48
1:A:1711:ARG:NH1	1:A:1715:GLU:OE2	2.47	0.48
1:A:2933:ILE:HD11	1:A:3121:LEU:HD13	1.95	0.48
1:A:881:LYS:O	1:A:883:TYR:N	2.47	0.47
1:A:2158:ARG:HG2	1:A:2196:TRP:NE1	2.29	0.47
1:A:2318:ALA:O	1:A:2322:VAL:HG23	2.14	0.47
1:A:1356:TRP:HB2	1:A:1411:TYR:HE1	1.78	0.47
1:A:1498:GLN:OE1	1:A:1541:ALA:N	2.48	0.47
1:A:3155:VAL:HG23	1:A:3156:PRO:HD3	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3302:LYS:HE3	2:C:393:PHE:O	2.14	0.47
1:A:62:ASP:HA	1:A:67:VAL:HG21	1.96	0.47
1:A:93:LEU:HD21	1:A:133:LYS:HB2	1.97	0.47
1:A:257:ARG:HE	1:A:258:PRO:HD2	1.80	0.47
1:A:3332:THR:HG23	1:A:3335:ARG:HH21	1.80	0.47
1:A:10:CYS:SG	1:A:2390:HIS:ND1	2.87	0.47
1:A:92:PHE:O	1:A:96:MET:HG3	2.14	0.47
1:A:1472:SER:OG	1:A:1474:ASP:OD2	2.27	0.47
1:A:1058:SER:O	1:A:1062:ARG:HG3	2.14	0.47
1:A:767:GLU:O	1:A:771:ASN:ND2	2.48	0.47
1:A:2412:TYR:CE2	1:A:2450:GLU:HG2	2.50	0.47
1:A:3557:ARG:O	1:A:3561:LYS:HG3	2.15	0.47
1:A:2860:ASP:O	1:A:2864:GLN:HG2	2.14	0.47
1:A:3606:ILE:HD12	1:A:3606:ILE:H	1.80	0.47
1:A:2304:VAL:HG13	1:A:2347:LYS:HD3	1.97	0.47
1:A:1239:PRO:HD2	1:A:1243:TYR:CE1	2.49	0.46
1:A:2474:TYR:O	1:A:2478:MET:HG3	2.15	0.46
1:A:66:LEU:H	1:A:66:LEU:HD12	1.81	0.46
1:A:710:PHE:O	1:A:714:VAL:HG23	2.15	0.46
1:A:3302:LYS:HB3	1:A:3302:LYS:HE2	1.54	0.46
1:A:3072:GLU:OE1	1:A:3072:GLU:N	2.46	0.46
1:A:3603:LYS:HD3	1:A:3605:ASN:HB2	1.97	0.46
1:A:646:VAL:O	1:A:650:SER:OG	2.28	0.46
1:A:1241:LEU:HG	1:A:1241:LEU:H	1.60	0.46
1:A:1723:PRO:O	1:A:1768:ARG:NH2	2.48	0.46
2:C:401:LEU:HB2	2:C:402:ARG:NH1	2.30	0.46
1:A:372:PRO:O	1:A:376:ILE:HG12	2.16	0.46
1:A:3817:LEU:HD23	1:A:3820:MET:HE1	1.98	0.46
1:A:359:LEU:HD11	1:A:391:ARG:HH21	1.80	0.46
1:A:3013:TYR:CB	2:C:402:ARG:HE	2.27	0.46
1:A:105:VAL:HG12	1:A:108:LYS:HE3	1.98	0.46
1:A:602:MET:SD	1:A:603:ILE:HG23	2.56	0.46
1:A:1188:ILE:HG21	1:A:1269:THR:HG21	1.98	0.46
1:A:1936:ARG:HA	1:A:1939:LEU:HD12	1.98	0.46
1:A:2269:ASP:OD1	1:A:2269:ASP:N	2.48	0.46
1:A:3706:ASP:OD1	1:A:3707:GLY:N	2.49	0.46
1:A:449:TYR:HB3	1:A:453:MET:HB3	1.98	0.45
1:A:250:ASN:O	1:A:254:LYS:HG2	2.16	0.45
1:A:1840:PHE:O	1:A:1844:VAL:HG23	2.17	0.45
1:A:2773:ARG:NE	1:A:2789:SER:OG	2.43	0.45
1:A:1186:LYS:O	1:A:1190:LEU:HD23	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1459:HIS:CE1	1:A:1520:ALA:HB1	2.51	0.45
1:A:3821:SER:OG	1:A:3824:GLU:HG3	2.17	0.45
1:A:913:ARG:NH1	1:A:916:GLU:OE1	2.49	0.45
1:A:1765:VAL:HA	1:A:1768:ARG:HD3	1.96	0.45
1:A:2338:GLU:HG3	1:A:2341:LEU:HB2	1.98	0.45
1:A:249:PHE:HB2	1:A:282:PHE:CD1	2.51	0.45
1:A:604:PRO:HG2	1:A:1083:ASN:HB3	1.98	0.45
1:A:878:GLU:OE2	1:A:881:LYS:HB3	2.17	0.45
1:A:1791:CYS:O	1:A:1795:VAL:HG12	2.16	0.45
1:A:1972:GLU:HG3	1:A:2132:LYS:HD3	1.98	0.45
1:A:3817:LEU:HA	1:A:3820:MET:HE2	1.99	0.45
1:A:59:PHE:HD1	1:A:66:LEU:HD11	1.82	0.45
1:A:1976:LEU:HD22	1:A:2142:ILE:HD13	1.99	0.45
1:A:3092:LEU:O	2:C:377:ARG:HG3	2.16	0.45
1:A:3479:THR:O	1:A:3479:THR:OG1	2.35	0.45
1:A:4003:ASP:O	1:A:4007:LYS:HG2	2.17	0.45
1:A:217:LEU:HD13	1:A:263:LYS:HE3	1.98	0.45
1:A:3091:LEU:HD23	1:A:3188:PHE:HE2	1.81	0.45
1:A:3451:LEU:HD12	1:A:3486:GLU:HB3	1.99	0.45
1:A:286:LEU:HD12	1:A:319:PHE:CD1	2.52	0.45
1:A:601:TRP:HE3	1:A:602:MET:N	2.15	0.45
1:A:1452:VAL:HG23	1:A:1517:LEU:HD22	1.99	0.45
1:A:2027:SER:OG	1:A:2028:LEU:N	2.49	0.45
1:A:391:ARG:HD2	1:A:391:ARG:HA	1.82	0.45
1:A:603:ILE:HG21	1:A:1031:ARG:HD2	1.99	0.45
1:A:1590:THR:O	1:A:1594:SER:OG	2.26	0.45
1:A:1843:ILE:HD11	1:A:1880:MET:HE1	1.97	0.45
1:A:2100:LEU:O	1:A:2104:MET:HG2	2.17	0.45
1:A:3596:LEU:O	1:A:3597:ALA:HB3	2.17	0.45
1:A:1686:LEU:HD23	1:A:1738:ASN:HB3	1.99	0.44
1:A:3091:LEU:HD21	1:A:3141:PHE:CE2	2.52	0.44
1:A:709:LYS:HG3	1:A:710:PHE:N	2.30	0.44
1:A:2761:LEU:HD23	1:A:2764:LYS:HB2	1.99	0.44
1:A:2870:SER:O	1:A:2870:SER:OG	2.25	0.44
1:A:3052:LEU:HD12	1:A:3061:LEU:HD23	1.99	0.44
1:A:132:ILE:HG12	1:A:180:LEU:HD22	1.99	0.44
1:A:660:LEU:HB3	1:A:663:ILE:HD12	1.98	0.44
1:A:2022:PRO:HB2	1:A:2052:TYR:HB3	1.98	0.44
1:A:124:LYS:O	1:A:128:LEU:HD13	2.17	0.44
1:A:1264:LEU:HD22	1:A:1344:PHE:HD2	1.81	0.44
1:A:1724:MET:HA	1:A:1768:ARG:HH21	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2100:LEU:HG	1:A:2104:MET:HE2	1.99	0.44
1:A:2596:ARG:HD2	1:A:2761:LEU:HD22	1.99	0.44
1:A:3459:ASN:O	1:A:3463:LEU:HG	2.18	0.44
1:A:404:ASP:N	1:A:404:ASP:OD1	2.51	0.44
1:A:3027:LEU:HD21	1:A:3048:LYS:HE3	1.99	0.44
1:A:93:LEU:HG	1:A:94:GLU:N	2.33	0.44
1:A:95:LYS:HE2	1:A:95:LYS:HB2	1.62	0.44
1:A:3372:LYS:HA	1:A:3372:LYS:HD2	1.82	0.44
1:A:3646:LYS:HA	1:A:3646:LYS:HD3	1.86	0.44
1:A:638:GLN:O	1:A:639:ALA:HB3	2.18	0.44
1:A:1239:PRO:HD2	1:A:1243:TYR:CZ	2.53	0.44
1:A:1876:ILE:HG22	1:A:1880:MET:HE1	1.99	0.44
1:A:377:ASN:ND2	1:A:380:ASP:OD1	2.44	0.43
1:A:502:GLU:HG3	1:A:2760:GLU:HA	2.00	0.43
1:A:1689:LYS:HE2	1:A:1717:LEU:HD13	1.99	0.43
1:A:1973:LYS:H	1:A:1973:LYS:HG3	1.63	0.43
1:A:2095:ALA:HB3	1:A:2096:PRO:HD3	2.00	0.43
1:A:2967:GLU:OE2	1:A:2971:GLN:NE2	2.42	0.43
1:A:3362:LEU:HD23	1:A:3362:LEU:HA	1.85	0.43
1:A:3863:ASN:OD1	1:A:3864:ARG:N	2.51	0.43
1:A:305:ASN:HB3	1:A:308:LEU:HB3	2.00	0.43
1:A:414:LEU:HA	1:A:417:VAL:HG22	2.00	0.43
1:A:1212:LEU:HD12	1:A:1212:LEU:HA	1.80	0.43
1:A:3036:TYR:HA	1:A:3040:TYR:HD2	1.83	0.43
1:A:1240:THR:HG23	1:A:1243:TYR:HE1	1.82	0.43
1:A:3659:PHE:O	1:A:3662:ILE:HG12	2.19	0.43
1:A:287:LEU:HG	1:A:337:LYS:NZ	2.32	0.43
1:A:468:LEU:HD22	1:A:475:LEU:HB3	1.99	0.43
1:A:2304:VAL:HG22	1:A:2347:LYS:HG3	1.99	0.43
1:A:3298:LEU:HD21	1:A:3351:ILE:HG12	1.99	0.43
1:A:741:ILE:HG21	1:A:776:TRP:CE2	2.53	0.43
1:A:759:GLY:HA2	1:A:762:TYR:O	2.17	0.43
1:A:1367:HIS:O	1:A:1371:VAL:HG22	2.19	0.43
1:A:1038:LYS:HB3	1:A:1038:LYS:HE2	1.77	0.43
1:A:2913:LYS:HB3	1:A:2913:LYS:HE2	1.68	0.43
1:A:1820:VAL:HA	1:A:1824:LEU:HB3	2.00	0.43
1:A:1500:LEU:HD12	1:A:1501:PRO:HD2	2.00	0.43
1:A:1627:LYS:HE3	1:A:1627:LYS:HB3	1.77	0.43
1:A:1774:MET:HE3	1:A:1777:LEU:HD12	2.00	0.43
1:A:1857:LYS:HE2	1:A:1857:LYS:HB3	1.85	0.43
1:A:3487:ILE:HD12	1:A:3487:ILE:HA	1.86	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3530:VAL:HA	1:A:3562:LEU:HD13	2.00	0.43
1:A:3562:LEU:HD23	1:A:3562:LEU:HA	1.87	0.43
1:A:245:SER:O	1:A:248:ILE:HG22	2.19	0.43
1:A:631:ARG:HH12	1:A:668:LYS:HB3	1.82	0.43
1:A:2361:ILE:HG12	1:A:2397:CYS:SG	2.58	0.43
1:A:2474:TYR:HE2	1:A:2517:LEU:HD13	1.84	0.43
1:A:4014:LYS:O	1:A:4017:GLU:HG3	2.18	0.43
1:A:603:ILE:O	1:A:603:ILE:HG13	2.15	0.42
1:A:722:LYS:HE3	1:A:722:LYS:HB3	1.48	0.42
1:A:1202:ARG:HH21	1:A:1207:TRP:HA	1.84	0.42
1:A:1515:LEU:HG	1:A:1519:PHE:CE2	2.54	0.42
1:A:3010:SER:CA	2:C:402:ARG:HD2	2.44	0.42
1:A:3193:ILE:HD12	1:A:3193:ILE:HA	1.89	0.42
1:A:1942:CYS:SG	1:A:1975:LEU:HG	2.59	0.42
1:A:2249:LEU:HD23	1:A:2249:LEU:HA	1.85	0.42
1:A:2500:LYS:HB3	1:A:2500:LYS:HE3	1.60	0.42
1:A:4128:MET:HE2	1:A:4128:MET:HB3	1.76	0.42
1:A:256:ILE:HG23	1:A:272:LEU:HD11	2.01	0.42
1:A:1301:ILE:O	1:A:1334:LYS:NZ	2.52	0.42
1:A:1633:TRP:HB3	1:A:1645:VAL:HG11	2.01	0.42
1:A:2347:LYS:HB3	1:A:2347:LYS:HE3	1.48	0.42
1:A:2513:GLU:H	1:A:2513:GLU:HG2	1.71	0.42
1:A:3310:ASN:HA	1:A:3313:SER:HB2	2.02	0.42
1:A:59:PHE:HA	1:A:66:LEU:HD11	2.02	0.42
1:A:405:ASP:OD1	1:A:405:ASP:N	2.50	0.42
1:A:676:ASN:HA	1:A:679:LYS:HE3	2.01	0.42
1:A:1444:ASP:OD1	1:A:1444:ASP:N	2.52	0.42
1:A:1639:LEU:O	1:A:1643:MET:HG3	2.20	0.42
1:A:1762:MET:HB3	1:A:1778:PHE:HE2	1.83	0.42
1:A:3843:LEU:O	1:A:3847:SER:OG	2.32	0.42
1:A:678:LYS:HE2	1:A:737:PRO:HA	2.02	0.42
1:A:1202:ARG:NH2	1:A:1210:ASP:OD1	2.52	0.42
1:A:2101:VAL:HG21	1:A:2149:LEU:HD21	2.02	0.42
1:A:2302:ALA:HA	1:A:2305:ASN:ND2	2.35	0.42
1:A:2374:LEU:O	1:A:2377:ARG:HD2	2.19	0.42
1:A:2394:LYS:HD3	1:A:2423:VAL:HG13	2.02	0.42
1:A:3203:ASP:OD1	1:A:3203:ASP:N	2.43	0.42
1:A:897:PRO:HG3	1:A:2787:HIS:HD2	1.85	0.42
1:A:919:LEU:HD21	1:A:971:ARG:HB3	2.02	0.42
1:A:2247:ASP:N	1:A:2247:ASP:OD1	2.53	0.42
1:A:97:GLY:O	1:A:98:GLN:C	2.58	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:338:LEU:HD13	1:A:372:PRO:HB2	2.01	0.42
1:A:466:LEU:HD21	1:A:541:MET:HE1	2.01	0.42
1:A:1724:MET:HB3	1:A:1725:GLN:OE1	2.20	0.42
1:A:2327:LEU:HD13	1:A:2341:LEU:HG	2.02	0.42
1:A:2341:LEU:HD23	1:A:2374:LEU:HD12	2.01	0.42
1:A:3111:MET:O	1:A:3115:SER:OG	2.31	0.42
1:A:14:ARG:O	1:A:18:THR:OG1	2.33	0.42
1:A:680:ILE:HD12	1:A:680:ILE:HA	1.88	0.42
1:A:1519:PHE:HB3	1:A:1570:GLU:OE1	2.19	0.42
1:A:3327:ASN:HB3	1:A:3388:ALA:HB2	2.01	0.42
1:A:3550:LYS:HD2	1:A:3550:LYS:HA	1.84	0.42
1:A:1407:LYS:HE2	1:A:1407:LYS:HB3	1.82	0.41
1:A:2373:PRO:O	1:A:2376:ASP:HB2	2.20	0.41
1:A:2928:LYS:HB2	1:A:2928:LYS:HE3	1.82	0.41
1:A:4006:VAL:HG22	1:A:4040:PRO:HB3	2.02	0.41
1:A:1000:LYS:HD3	1:A:1000:LYS:HA	1.80	0.41
1:A:1797:LEU:O	1:A:1801:VAL:HG23	2.20	0.41
1:A:2126:MET:HG2	1:A:2164:TRP:HZ2	1.85	0.41
1:A:371:GLY:O	1:A:375:VAL:HG13	2.20	0.41
1:A:713:GLU:O	1:A:717:LYS:HG3	2.20	0.41
1:A:1981:LEU:HD23	1:A:1981:LEU:H	1.86	0.41
1:A:2428:ASP:OD2	1:A:2431:ARG:NH2	2.53	0.41
1:A:3098:ARG:HH22	2:C:369:TYR:HA	1.85	0.41
1:A:3281:CYS:HB2	1:A:3329:LEU:HD13	2.02	0.41
1:A:563:LEU:O	1:A:567:GLU:HG2	2.20	0.41
1:A:3013:TYR:HB3	2:C:402:ARG:HE	1.86	0.41
1:A:3260:LYS:HG3	2:C:395:ASP:CG	2.40	0.41
1:A:690:SER:O	1:A:690:SER:OG	2.36	0.41
1:A:740:ILE:HA	1:A:743:LEU:HD22	2.01	0.41
1:A:1008:ALA:HA	1:A:1011:GLU:HG2	2.01	0.41
1:A:1037:LEU:HD22	1:A:1085:ILE:HG23	2.02	0.41
1:A:2394:LYS:HE3	1:A:2394:LYS:HB2	1.87	0.41
1:A:3463:LEU:HB2	1:A:3997:LEU:HD11	2.03	0.41
1:A:40:GLN:O	1:A:44:LEU:HB2	2.20	0.41
1:A:287:LEU:HD12	1:A:287:LEU:HA	1.87	0.41
1:A:804:ALA:HB2	1:A:3115:SER:HB2	2.02	0.41
1:A:3098:ARG:HD2	1:A:3102:TYR:CE2	2.56	0.41
2:C:383:ARG:HD2	2:C:383:ARG:HA	1.81	0.41
1:A:579:LEU:HD23	1:A:579:LEU:HA	1.87	0.41
1:A:679:LYS:H	1:A:679:LYS:HG3	1.60	0.41
1:A:1851:LEU:HA	1:A:1870:LYS:HD3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3128:LYS:O	1:A:3132:VAL:HG12	2.21	0.41
1:A:3958:LEU:HD22	1:A:4064:LEU:HD11	2.03	0.41
1:A:2055:SER:HB2	1:A:2060:ARG:HH21	1.85	0.41
1:A:3416:LEU:HD23	1:A:3449:LYS:HZ3	1.85	0.41
1:A:357:LYS:H	1:A:357:LYS:HG2	1.65	0.41
1:A:399:GLN:HB2	1:A:2052:TYR:CE2	2.56	0.41
1:A:402:THR:HA	1:A:2018:ASP:HA	2.03	0.41
1:A:897:PRO:HG3	1:A:2787:HIS:CD2	2.54	0.41
1:A:1966:LEU:HD12	1:A:1966:LEU:HA	1.87	0.41
1:A:2844:LEU:HD23	1:A:2844:LEU:HA	1.90	0.41
1:A:3274:VAL:O	1:A:3278:GLN:HG3	2.20	0.41
1:A:3653:ARG:HH21	1:A:3654:MET:HB2	1.83	0.41
1:A:3992:ARG:HG2	1:A:4051:LEU:O	2.21	0.41
2:C:366:GLU:CD	2:C:366:GLU:H	2.24	0.41
1:A:163:LYS:HD3	1:A:163:LYS:HA	1.81	0.41
1:A:330:ASN:HB3	1:A:334:HIS:HD1	1.86	0.41
1:A:534:LEU:O	1:A:537:SER:OG	2.39	0.41
1:A:627:VAL:O	1:A:631:ARG:HG3	2.20	0.41
1:A:743:LEU:HA	1:A:743:LEU:HD12	1.82	0.41
1:A:2534:ASN:O	1:A:2535:THR:HG22	2.21	0.41
1:A:3311:ASN:OD1	1:A:3312:VAL:N	2.54	0.41
1:A:4064:LEU:HD13	1:A:4077:TYR:HB3	2.03	0.41
1:A:195:ASN:OD1	1:A:198:ARG:NH2	2.45	0.40
1:A:715:ALA:O	1:A:718:MET:HG2	2.21	0.40
1:A:257:ARG:NE	1:A:258:PRO:HD2	2.36	0.40
1:A:290:TYR:CZ	1:A:337:LYS:HG3	2.57	0.40
1:A:468:LEU:HD23	1:A:468:LEU:HA	1.88	0.40
1:A:1790:SER:OG	1:A:1791:CYS:N	2.54	0.40
1:A:1923:PHE:CZ	1:A:1945:TYR:HA	2.56	0.40
1:A:2207:LYS:HD2	1:A:2207:LYS:HA	1.81	0.40
1:A:2473:MET:O	1:A:2477:LEU:HG	2.21	0.40
1:A:3881:ASP:OD1	1:A:3881:ASP:N	2.55	0.40
1:A:90:CYS:O	1:A:94:GLU:HG2	2.21	0.40
1:A:1254:LEU:HD12	1:A:1329:ARG:HH21	1.86	0.40
1:A:2294:ILE:HG12	1:A:2295:GLN:HE21	1.86	0.40
1:A:2346:ALA:HA	1:A:2349:LEU:HD23	2.03	0.40
1:A:3512:VAL:HA	1:A:3515:GLN:HG3	2.03	0.40
1:A:3673:ASP:OD1	1:A:3674:SER:N	2.53	0.40
1:A:870:LEU:HD22	1:A:3129:LEU:HD21	2.03	0.40
1:A:1217:VAL:O	1:A:1221:ILE:HG13	2.20	0.40
1:A:2581:LEU:HD11	1:A:2783:ILE:HG23	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:376:LYS:HD3	2:C:376:LYS:HA	1.79	0.40
1:A:318:SER:O	1:A:322:GLN:HG2	2.22	0.40
1:A:524:TYR:CE1	1:A:628:GLU:HB3	2.57	0.40
1:A:587:THR:HG23	1:A:588:VAL:HG13	2.04	0.40
1:A:2562:LEU:HD23	1:A:2562:LEU:HA	1.88	0.40
1:A:3271:ASP:HA	1:A:3274:VAL:HG12	2.04	0.40
1:A:3708:ARG:O	1:A:3710:LYS:NZ	2.52	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [\(i\)](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	3896/4128 (94%)	3699 (95%)	191 (5%)	6 (0%)	44 72
2	C	50/707 (7%)	38 (76%)	11 (22%)	1 (2%)	6 29
All	All	3946/4835 (82%)	3737 (95%)	202 (5%)	7 (0%)	45 72

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	882	SER
1	A	2161	ALA
1	A	2162	LYS
1	A	3716	HIS
1	A	682	TYR
1	A	743	LEU
2	C	365	THR

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	3474/3671 (95%)	3312 (95%)	162 (5%)	22	51
2	C	50/647 (8%)	29 (58%)	21 (42%)	0	0
All	All	3524/4318 (82%)	3341 (95%)	183 (5%)	22	48

All (183) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	19	LEU
1	A	66	LEU
1	A	93	LEU
1	A	95	LYS
1	A	96	MET
1	A	136	GLN
1	A	139	ARG
1	A	197	PHE
1	A	283	SER
1	A	285	CYS
1	A	287	LEU
1	A	288	ASP
1	A	325	ASN
1	A	333	MET
1	A	382	ASP
1	A	425	ASP
1	A	441	MET
1	A	457	CYS
1	A	477	ASN
1	A	509	ARG
1	A	536	SER
1	A	601	TRP
1	A	603	ILE
1	A	605	THR
1	A	620	PHE
1	A	638	GLN
1	A	640	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	649	PHE
1	A	679	LYS
1	A	680	ILE
1	A	681	LYS
1	A	693	HIS
1	A	709	LYS
1	A	712	LYS
1	A	722	LYS
1	A	723	ASP
1	A	724	GLU
1	A	739	ASN
1	A	743	LEU
1	A	746	ARG
1	A	774	GLU
1	A	784	VAL
1	A	786	GLN
1	A	847	SER
1	A	850	GLU
1	A	879	MET
1	A	880	MET
1	A	913	ARG
1	A	964	ARG
1	A	971	ARG
1	A	1031	ARG
1	A	1060	PHE
1	A	1061	LYS
1	A	1087	ARG
1	A	1090	ARG
1	A	1099	PHE
1	A	1178	ARG
1	A	1212	LEU
1	A	1213	LYS
1	A	1236	LEU
1	A	1241	LEU
1	A	1267	TYR
1	A	1344	PHE
1	A	1374	GLN
1	A	1444	ASP
1	A	1466	ASN
1	A	1503	LEU
1	A	1524	LEU
1	A	1525	CYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1527	ARG
1	A	1529	VAL
1	A	1574	ASN
1	A	1589	ASN
1	A	1608	ARG
1	A	1631	SER
1	A	1685	ASP
1	A	1772	HIS
1	A	1794	GLN
1	A	1840	PHE
1	A	1869	LYS
1	A	1871	MET
1	A	1938	ARG
1	A	1945	TYR
1	A	1956	PHE
1	A	1967	PHE
1	A	1981	LEU
1	A	2018	ASP
1	A	2024	TYR
1	A	2033	ASP
1	A	2041	SER
1	A	2058	ASP
1	A	2090	ARG
1	A	2093	CYS
1	A	2094	MET
1	A	2097	LEU
1	A	2126	MET
1	A	2155	GLU
1	A	2156	VAL
1	A	2221	LYS
1	A	2300	PHE
1	A	2328	ARG
1	A	2339	GLU
1	A	2341	LEU
1	A	2342	CYS
1	A	2344	LEU
1	A	2347	LYS
1	A	2349	LEU
1	A	2350	LYS
1	A	2374	LEU
1	A	2377	ARG
1	A	2388	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	2389	PHE
1	A	2424	MET
1	A	2426	HIS
1	A	2429	ASP
1	A	2482	ASP
1	A	2485	ARG
1	A	2497	GLU
1	A	2500	LYS
1	A	2503	LYS
1	A	2547	SER
1	A	2595	TRP
1	A	2597	PHE
1	A	2801	ASP
1	A	2823	PHE
1	A	2909	ARG
1	A	2911	ARG
1	A	2913	LYS
1	A	2915	ARG
1	A	2916	LEU
1	A	2962	ARG
1	A	3009	LYS
1	A	3059	GLN
1	A	3143	SER
1	A	3181	ASP
1	A	3284	SER
1	A	3302	LYS
1	A	3325	ASP
1	A	3347	CYS
1	A	3354	ASP
1	A	3401	TRP
1	A	3425	ARG
1	A	3452	LYS
1	A	3588	TRP
1	A	3598	LYS
1	A	3610	TYR
1	A	3614	TYR
1	A	3642	LYS
1	A	3708	ARG
1	A	3710	LYS
1	A	3782	SER
1	A	3800	LEU
1	A	3808	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	3820	MET
1	A	3825	LYS
1	A	3858	MET
1	A	3876	SER
1	A	3972	LEU
1	A	3982	SER
1	A	4017	GLU
1	A	4065	LEU
1	A	4124	TRP
2	C	362	SER
2	C	363	GLN
2	C	364	SER
2	C	365	THR
2	C	369	TYR
2	C	370	LYS
2	C	372	LEU
2	C	374	LYS
2	C	375	LEU
2	C	376	LYS
2	C	377	ARG
2	C	381	VAL
2	C	383	ARG
2	C	384	ASP
2	C	386	GLU
2	C	389	ASP
2	C	392	LEU
2	C	395	ASP
2	C	397	LEU
2	C	402	ARG
2	C	407	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	676	ASN
1	A	771	ASN
1	A	857	GLN
1	A	1238	GLN
1	A	1611	GLN
1	A	1859	ASN
1	A	2348	GLN
1	A	2481	HIS

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	2977	ASN

### 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 oligosaccharides 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.

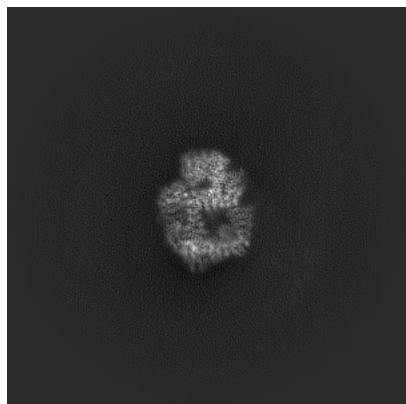
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26192. These allow visual inspection of the internal detail of the map and identification of artifacts.

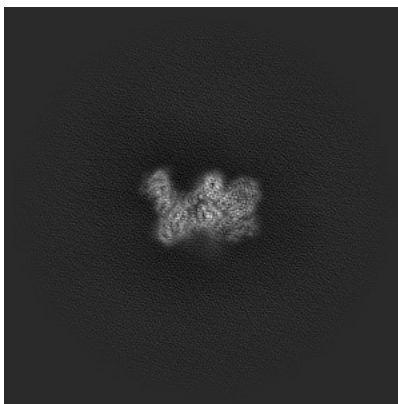
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

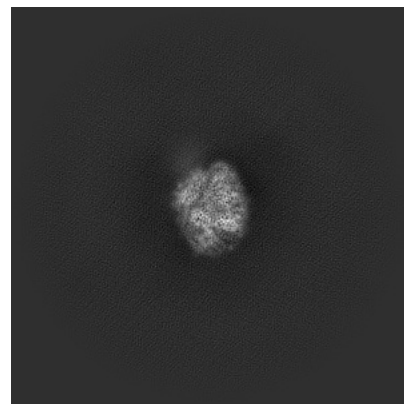
#### 6.1.1 Primary map



X

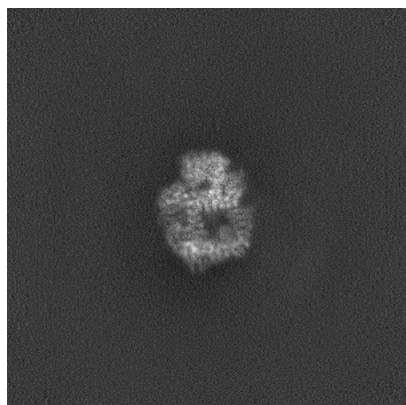


Y

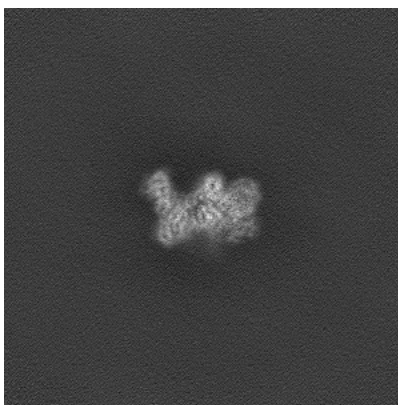


Z

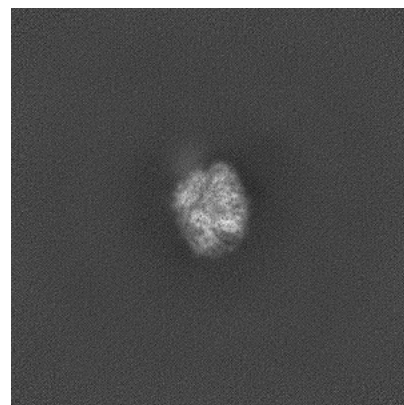
#### 6.1.2 Raw map



X



Y

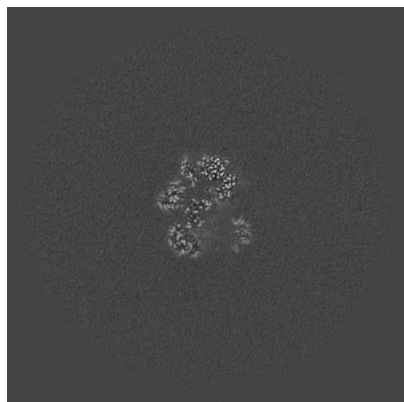


Z

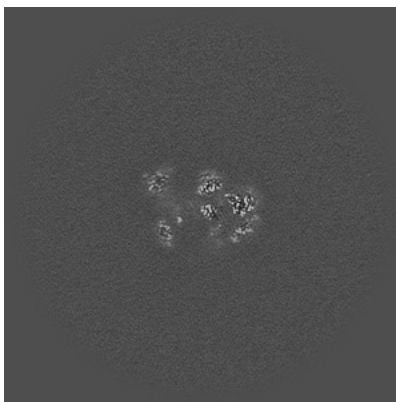
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

### 6.2.1 Primary map



X Index: 256

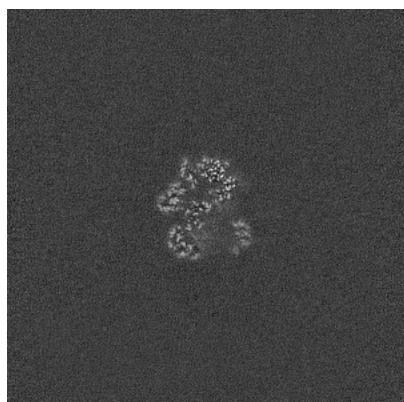


Y Index: 256

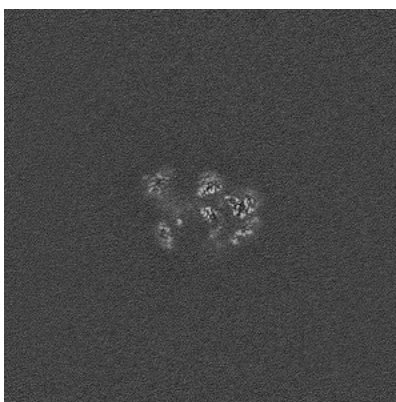


Z Index: 256

### 6.2.2 Raw map



X Index: 256



Y Index: 256

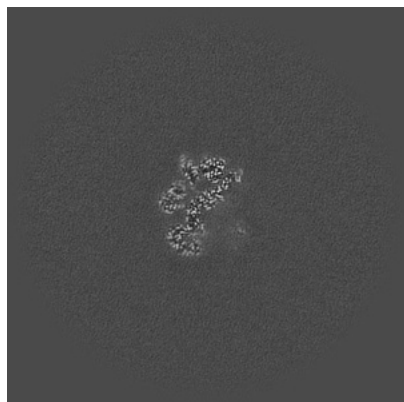


Z Index: 256

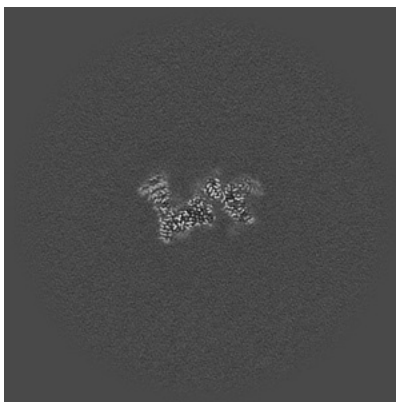
The images above show central slices of the map in three orthogonal directions.

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

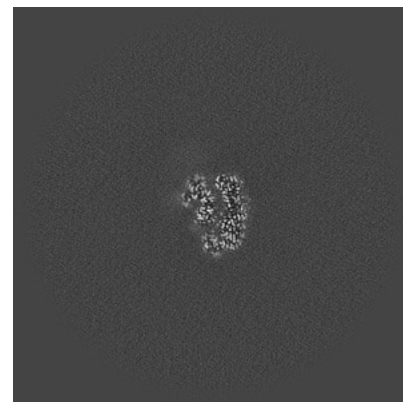
### 6.3.1 Primary map



X Index: 252

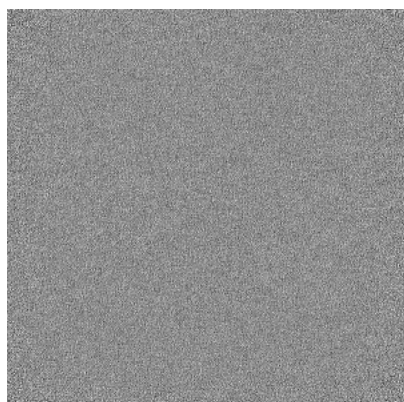


Y Index: 238

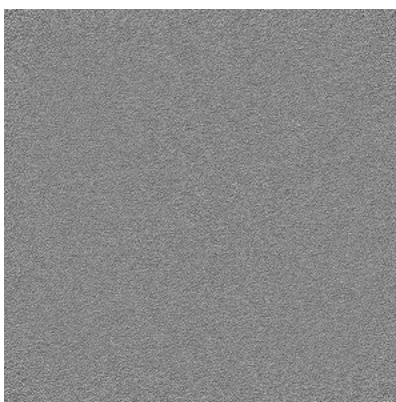


Z Index: 265

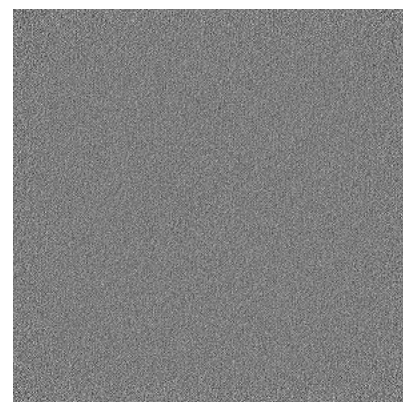
### 6.3.2 Raw map



X Index: 0



Y Index: 0

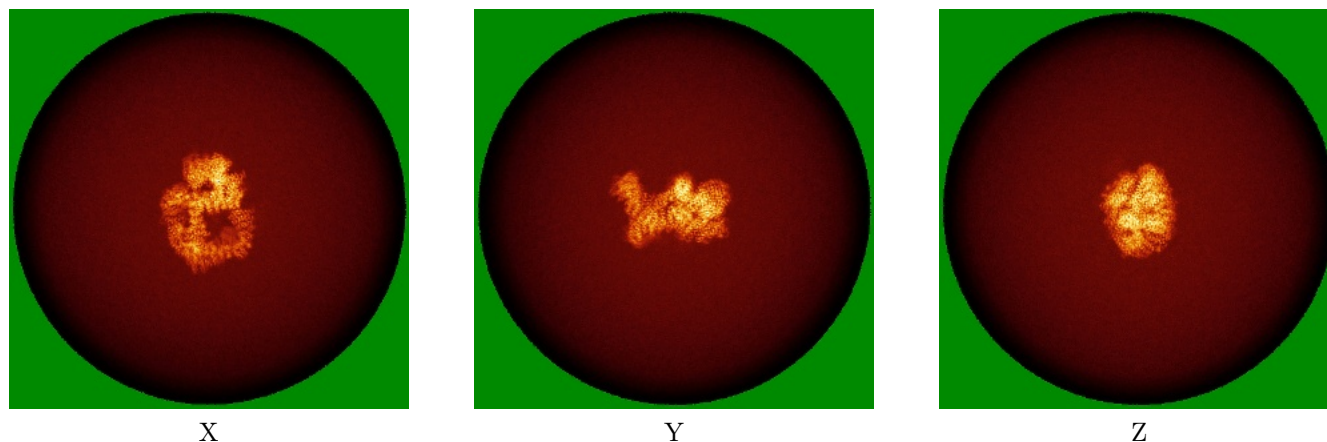


Z Index: 0

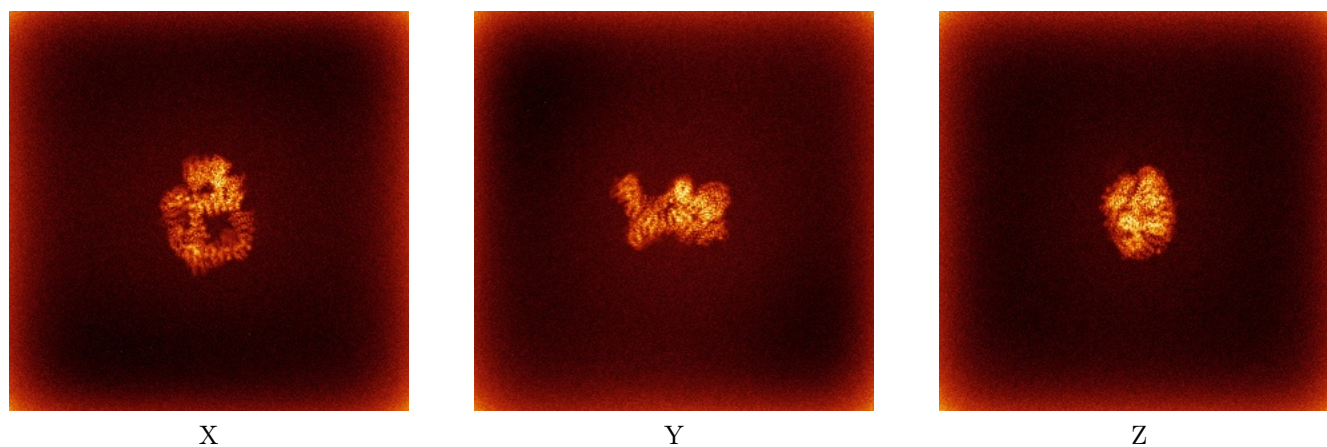
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



### 6.4.2 Raw map



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 0.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

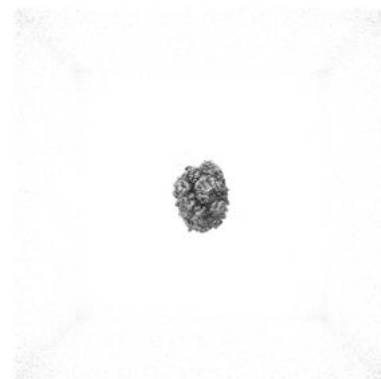
### 6.5.2 Raw map



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.

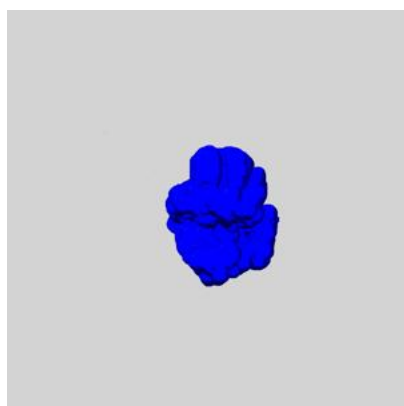
## 6.6 Mask visualisation [i](#)

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

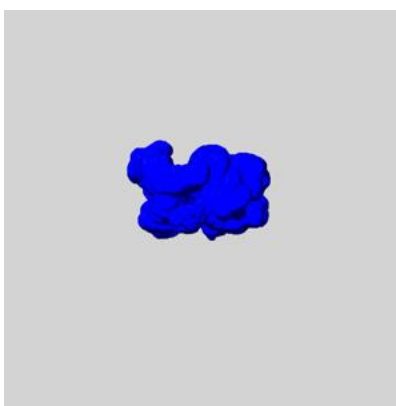
A mask typically either:

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

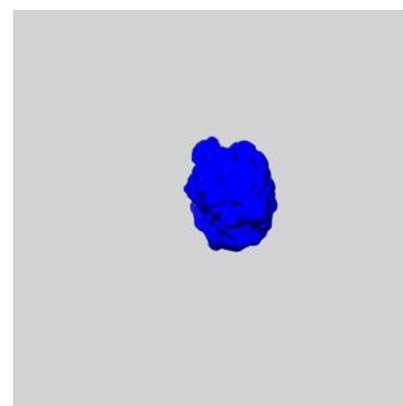
### 6.6.1 emd\_26192\_msk\_1.map [i](#)



X



Y

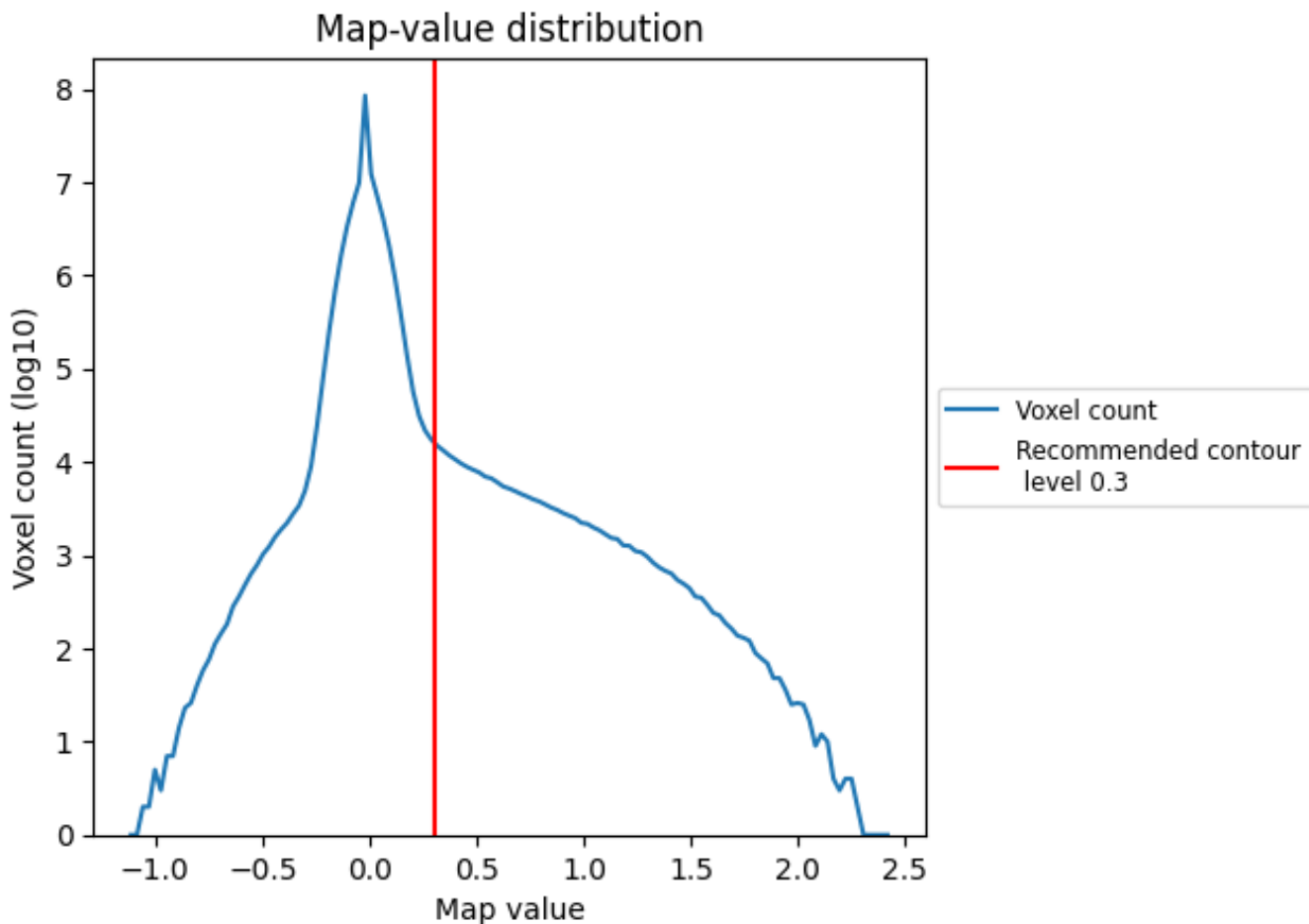


Z

## 7 Map analysis [i](#)

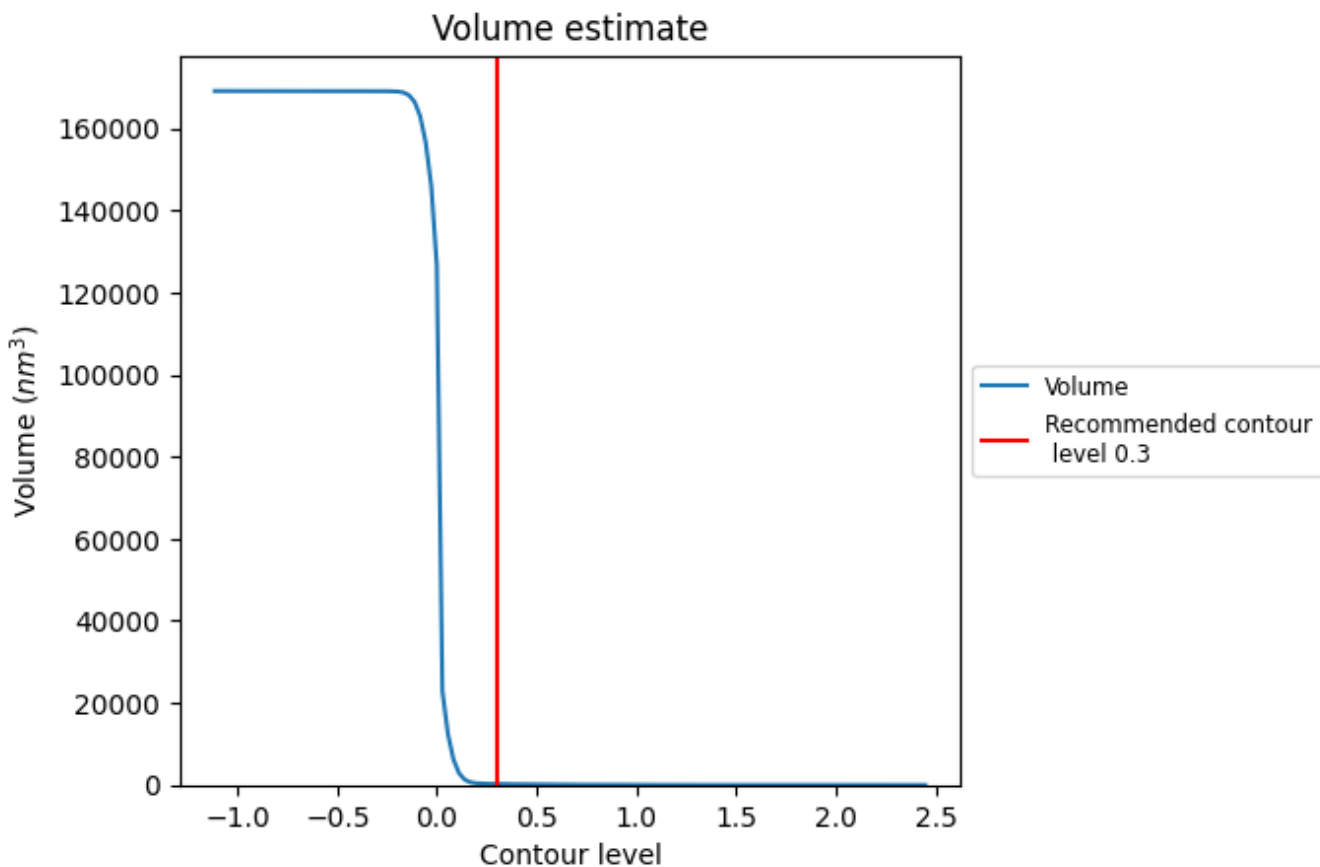
This section contains the results of statistical analysis of the map.

### 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.

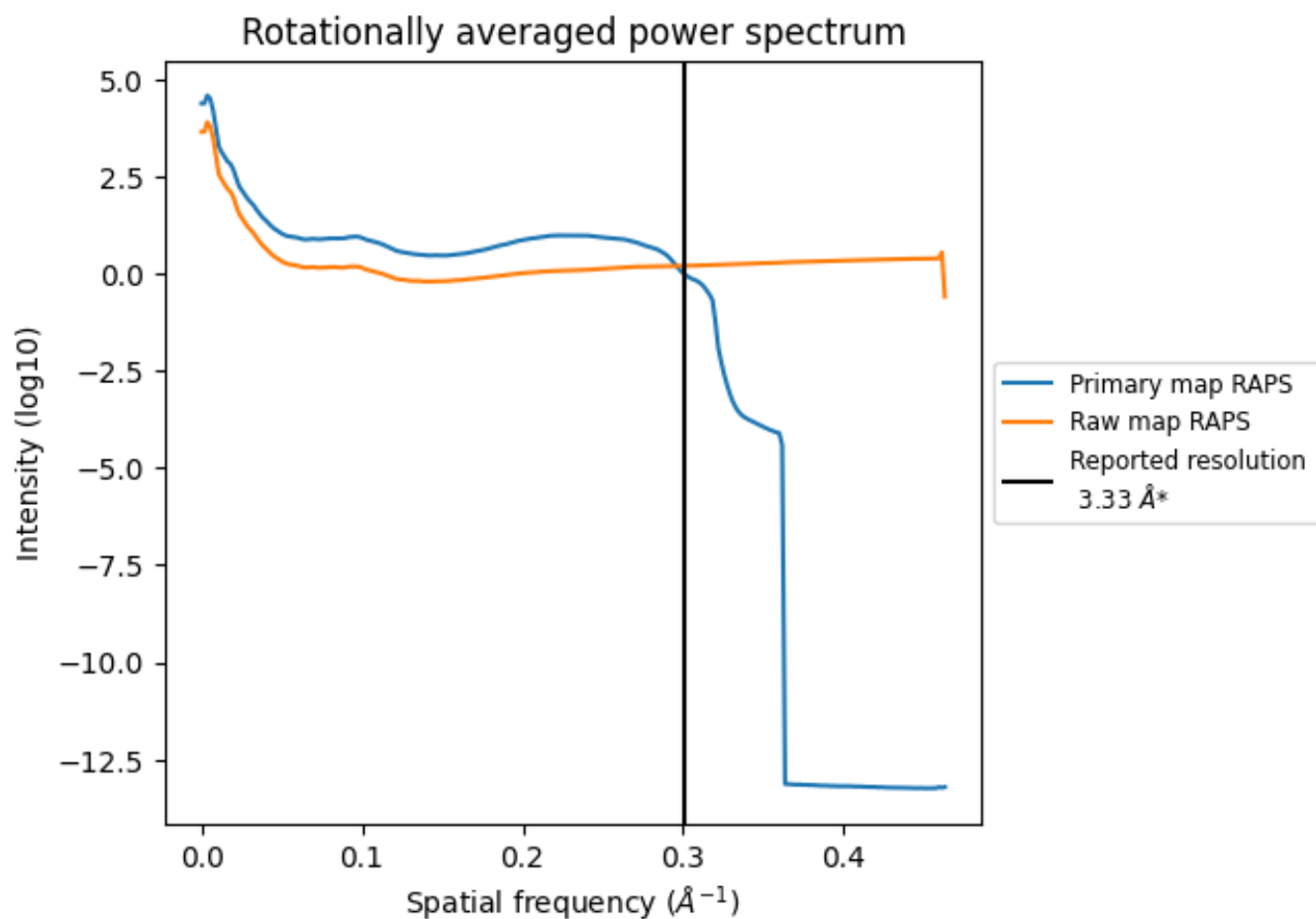
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 240  $\text{nm}^3$ ; this corresponds to an approximate mass of 217 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](#)

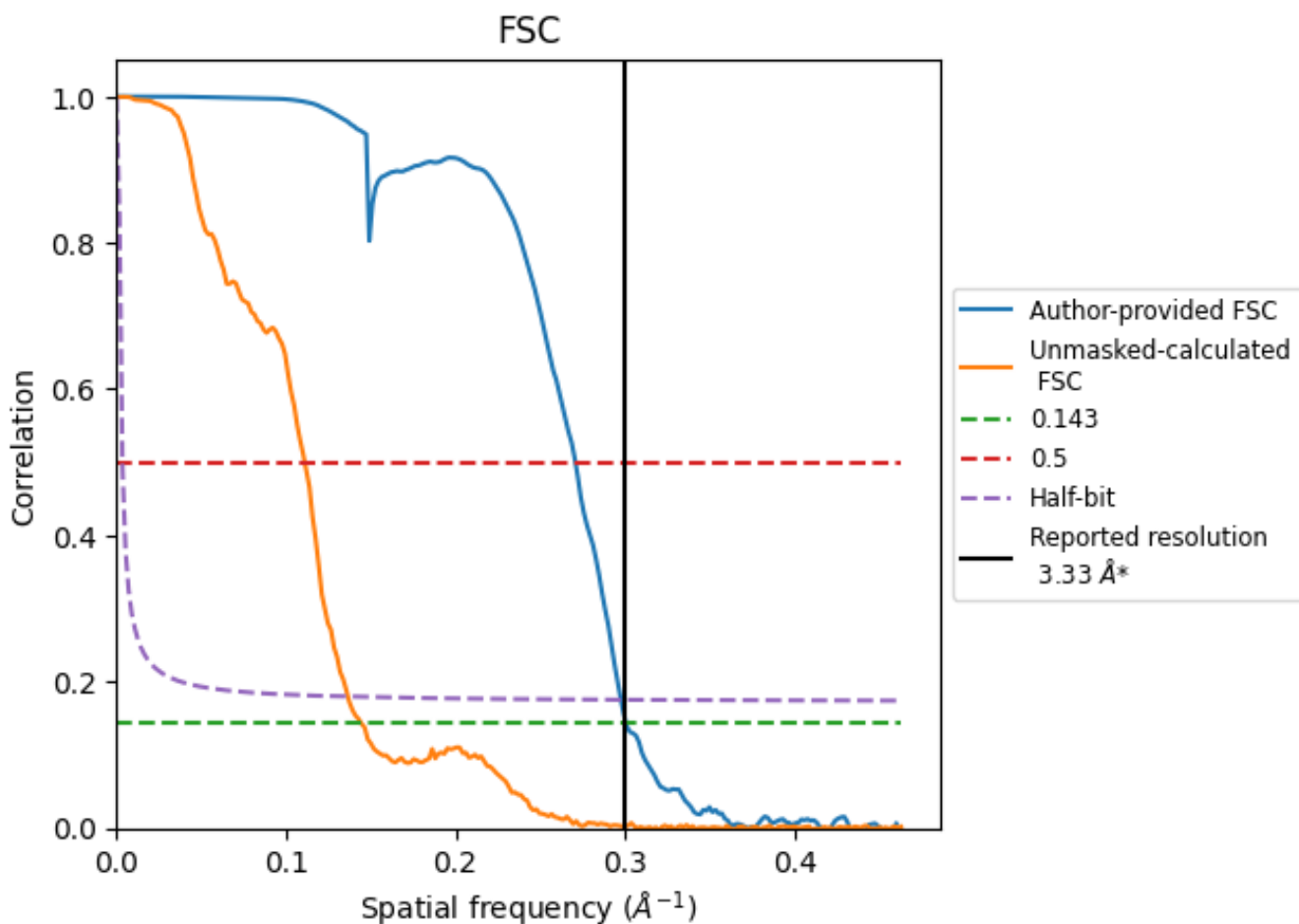


\*Reported resolution corresponds to spatial frequency of 0.300 Å<sup>-1</sup>

## 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 0.300 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

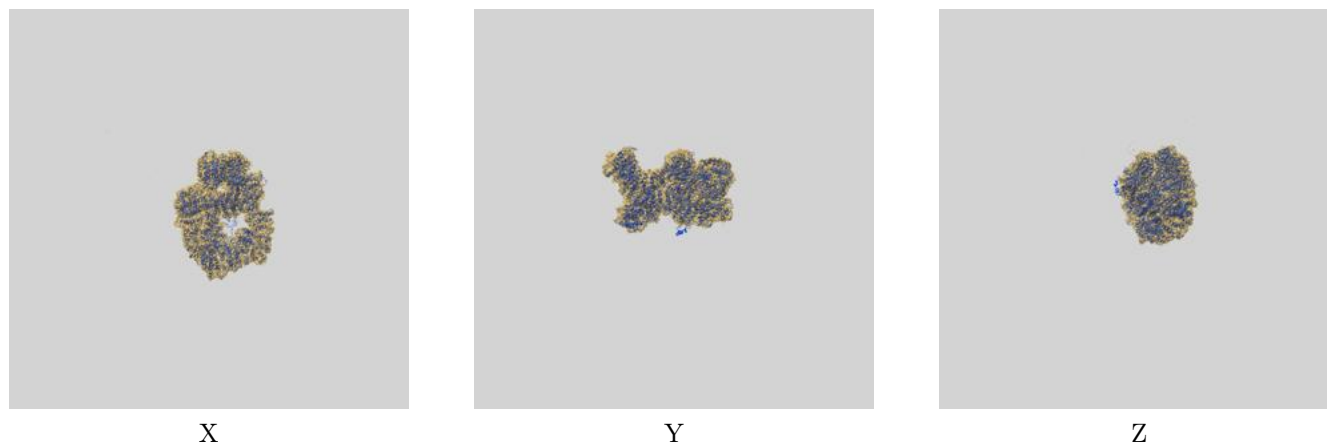
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.33	-	-
Author-provided FSC curve	3.33	3.69	3.36
Unmasked-calculated*	6.93	9.00	7.32

\*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 6.93 differs from the reported value 3.33 by more than 10 %

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

This section contains information regarding the fit between EMDB map EMD-26192 and PDB model 7TYR. Per-residue inclusion information can be found in section [3](#) on page [4](#).

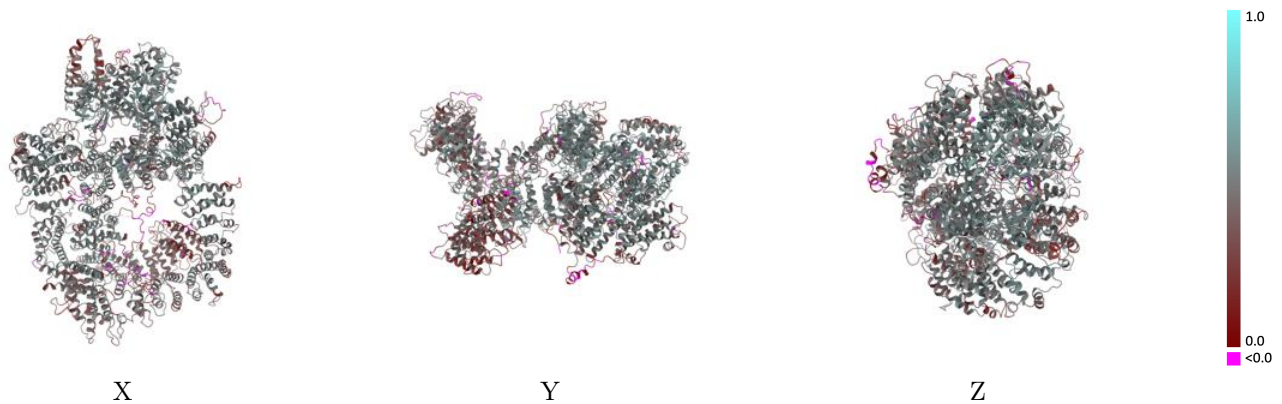
### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.3 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.

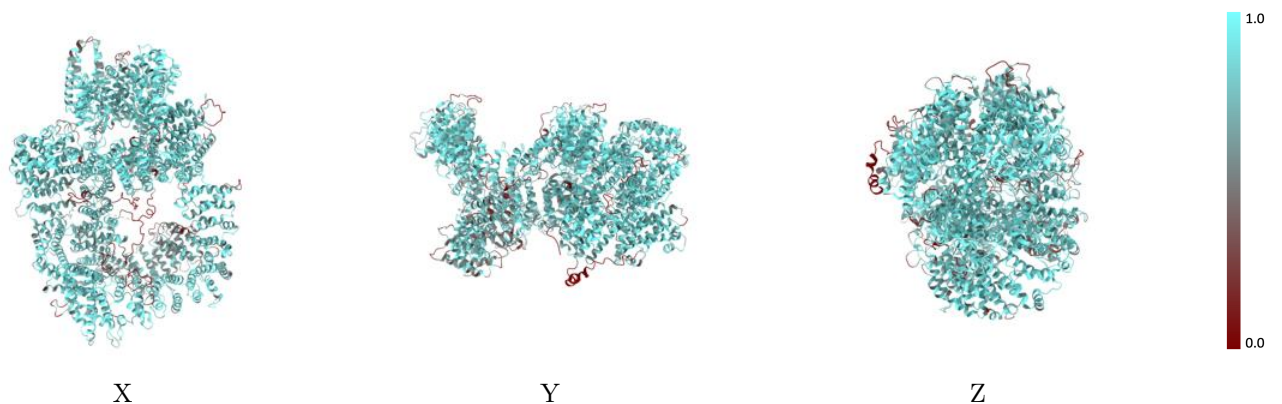


## 9.2 Q-score mapped to coordinate model [i](#)



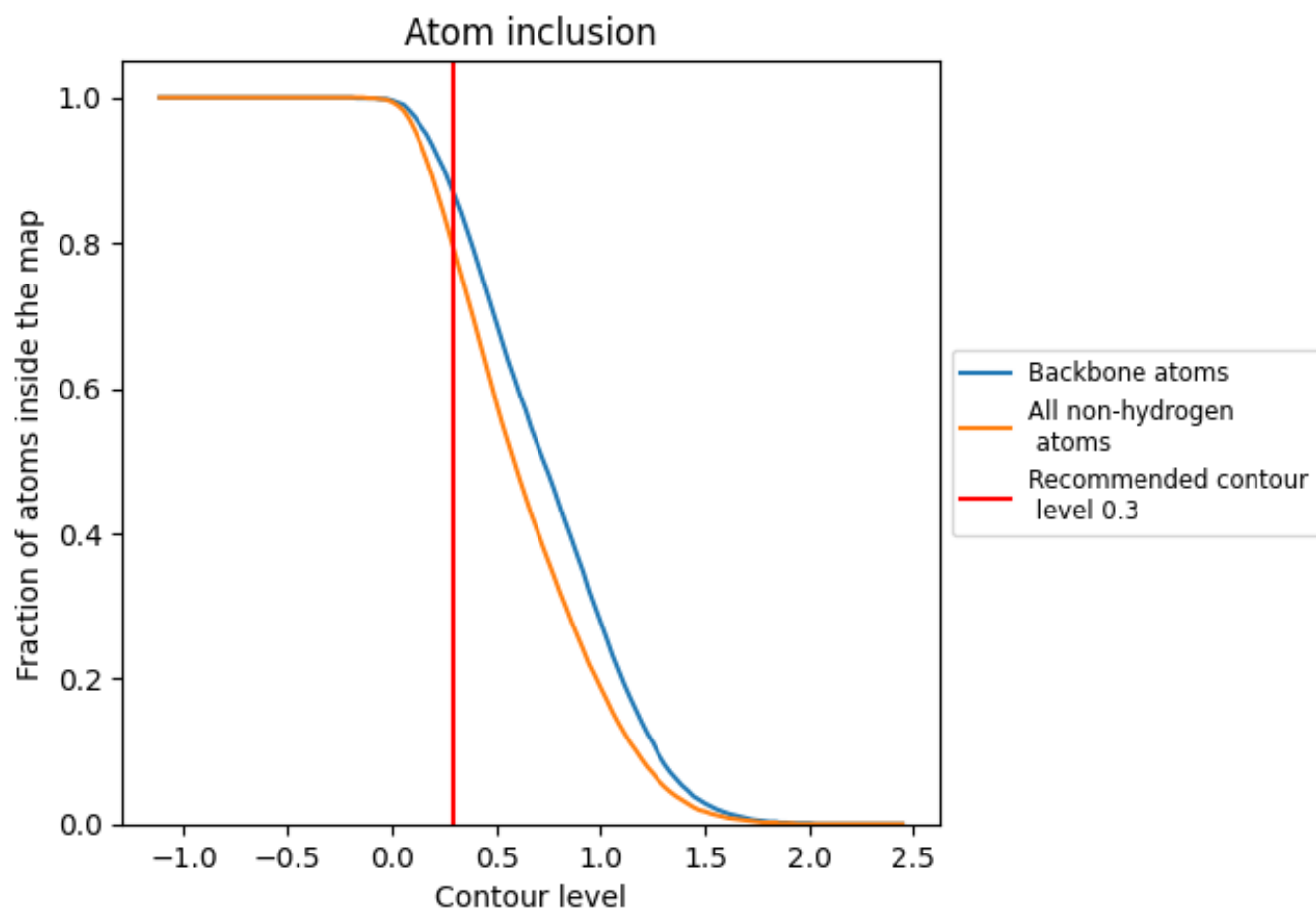
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.3).







## 9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 79% 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 (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7890	 0.4330
A	 0.7960	 0.4360
C	 0.3220	 0.2170

