



Full wwPDB EM Validation Report ⓘ

Oct 1, 2024 – 10:24 AM EDT

PDB ID : 8VH5
EMDB ID : EMD-43235
Title : Cryo-EM structure of Rab12-LRRK2 complex in the LRRK2 dimer state
Authors : Zhu, H.; Sun, J.
Deposited on : 2023-12-30
Resolution : 4.00 Å(reported)

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

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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>.

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

EMDB validation analysis : 0.0.1.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

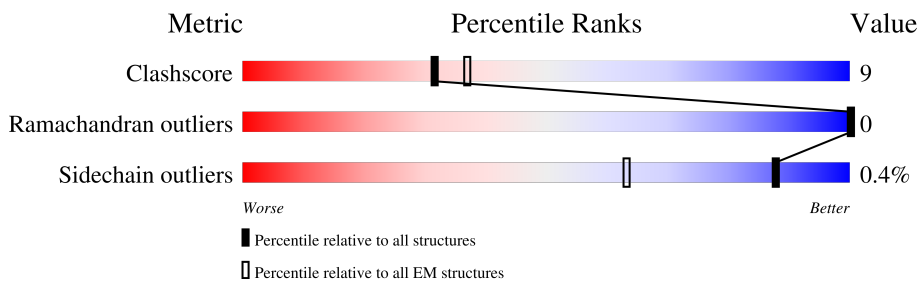
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.00 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 ≥ 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	2527	
1	C	2527	
2	B	176	
2	D	176	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 33744 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 Leucine-rich repeat serine/threonine-protein kinase 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2221	Total	C	N	O	S	0	0
			15573	10054	2651	2783	85		
1	C	2221	Total	C	N	O	S	0	0
			15587	10060	2655	2787	85		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	50	HIS	ARG	conflict	UNP Q5S007
A	1647	THR	SER	conflict	UNP Q5S007
A	2397	THR	MET	conflict	UNP Q5S007
C	50	HIS	ARG	conflict	UNP Q5S007
C	1647	THR	SER	conflict	UNP Q5S007
C	2397	THR	MET	conflict	UNP Q5S007

- Molecule 2 is a protein called Ras-related protein Rab-12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	171	Total	C	N	O	S	0	0
			1200	775	199	220	6		
2	D	171	Total	C	N	O	S	0	0
			1200	775	199	220	6		

There are 2 discrepancies between the modelled and reference sequences:

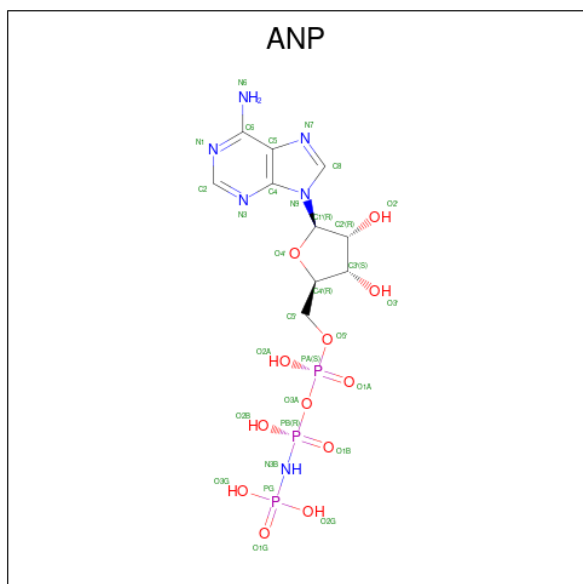
Chain	Residue	Modelled	Actual	Comment	Reference
B	101	LEU	GLN	conflict	UNP Q6IQ22
D	101	LEU	GLN	conflict	UNP Q6IQ22

- Molecule 3 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
3	A	1	Total	C	N	O	P	0
			28	10	5	11	2	
3	C	1	Total	C	N	O	P	0
			28	10	5	11	2	

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
4	A	1	Total	C	N	O	P	0
			31	10	6	12	3	

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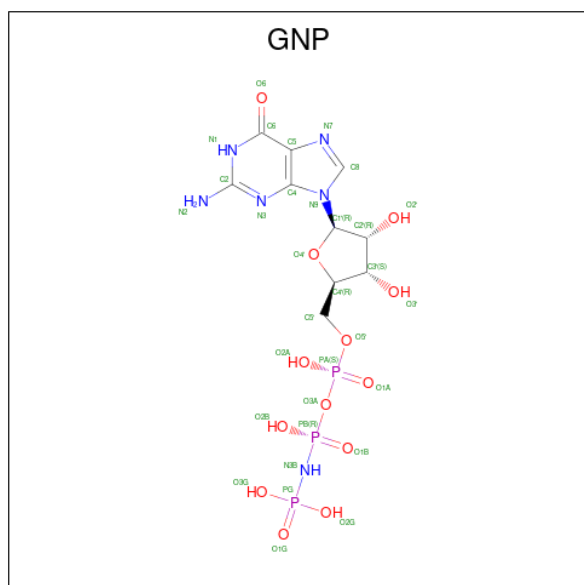
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Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
4	C	1	31	10	6	12	3	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

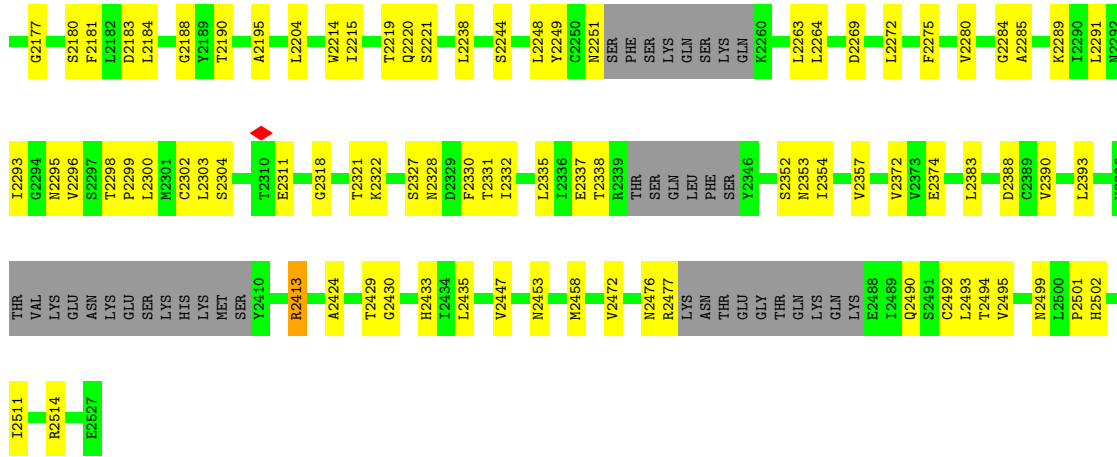
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
5	B	1	1	1	0
5	D	1	1	1	0

- Molecule 6 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula: C₁₀H₁₇N₆O₁₃P₃) (labeled as "Ligand of Interest" by depositor).

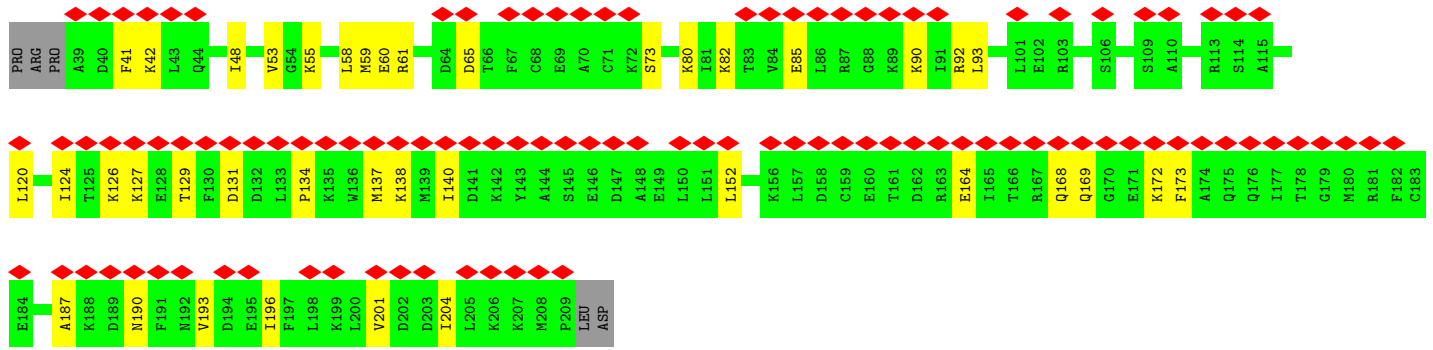
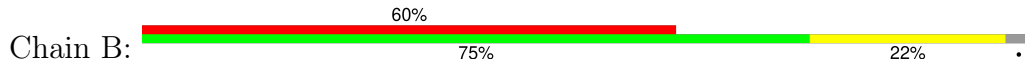


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
6	B	1	32	10	6	13	3	0
6	D	1	32	10	6	13	3	0

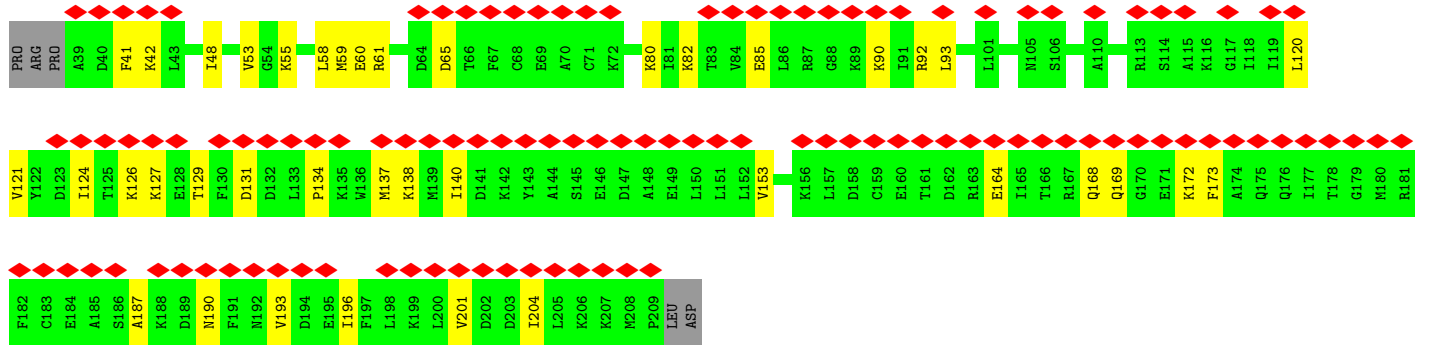
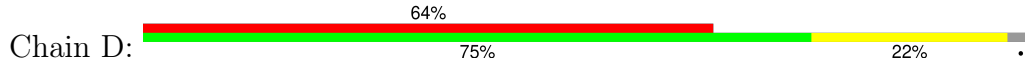
ARG	E982	E983	Y984	Y985	S986	L987	S988	L989	S990	A991	N992	L1000	C1004	C1005	I1006	S1007	L1010	L1013	E1014	K1015	N1021	L1034	L1037	D1041	L1042	H1043	S1044	M1045	S1052	S1058	C1059	M1062	R1067	I1070	D1077	Q1087	L1090	S1091	Y1092	M1093	G1116																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
K1138	E1146	N1147	G1346	K1347	P1169	I1177	P1189	E1190	A1191	I1192	L1193	N1194	L1195	L1198	R1199	S1200	L1225	L1226	F1227	L1237	H1251	M1255	I1260	C1266	D1274	M1278	L1281	S1282	S1283	M1286	E1287	K1290	M1305	D1317	L1322	M1333	L1337	M1338	L1339	V1340																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
G1341	N1342	G1346	K1347	T1357	LYS	LYS	SER	ASP	LEU	GLY	MET	Q1365	T1368	V1369	V1373	K1374	D1375	W1376	P1377	I1378	R1381	ASP	L1388	V1389	N1391	W1392	W1393	D1394	F1395	R1398	F1408	Y1415	Y1419	P1433	W1434	N1437	I1438	K1439	A1440	R1441	V1447	I1448																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
G1451	T1452	D1455	W1456	S1457	ASP	GLU	LYS	GLN	ARG	K1463	P1480	D1484	T1491	E1492	I1605	N1606	M1610	M1611	F1611	K1612	L1617	W1618	W1619	C1626	V1641	V1642	V1643	V1644	V1645	V1646	V1647	V1648	V1649	V1650	V1651	V1652	V1653	V1654	V1655	V1656	V1657	V1658	V1659	V1660	V1661	V1662	V1663	V1664	V1665	V1666	V1667	V1668	V1669	V1670	V1671	V1672	V1673	V1674	V1675	V1676	V1677	V1678	V1679	V1680	V1681	V1682	V1683	V1684	V1685	V1686	V1687	V1688	V1689	V1690	V1691	V1692	V1693	V1694	V1695	V1696	V1697	V1698	V1699	V1700	V1701	V1702	V1703	V1704	V1705	V1706	V1707	V1708	V1709	V1710	V1711	V1712	V1713	V1714	V1715	V1716	V1717	V1718	V1719	V1720	V1721	V1722	V1723	V1724	V1725	V1726	V1727	V1728	V1729	V1730	V1731	V1732	V1733	V1734	V1735	V1736	V1737	V1738	V1739	V1740	V1741	V1742	V1743	V1744	V1745	V1746	V1747	V1748	V1749	V1750	V1751	V1752	V1753	V1754	V1755	V1756	V1757	V1758	V1759	V1760	V1761	V1762	V1763	V1764	V1765	V1766	V1767	V1768	V1769	V1770	V1771	V1772	V1773	V1774	V1775	V1776	V1777	V1778	V1779	V1780	V1781	V1782	V1783	V1784	V1785	V1786	V1787	V1788	V1789	V1790	V1791	V1792	V1793	V1794	V1795	V1796	V1797	V1798	V1799	V1800	V1801	V1802	V1803	V1804	V1805	V1806	V1807	V1808	V1809	V1810	V1811	V1812	V1813	V1814	V1815	V1816	V1817	V1818	V1819	V1820	V1821	V1822	V1823	V1824	V1825	V1826	V1827	V1828	V1829	V1830	V1831	V1832	V1833	V1834	V1835	V1836	V1837	V1838	V1839	V1840	V1841	V1842	V1843	V1844	V1845	V1846	V1847	V1848	V1849	V1850	V1851	V1852	V1853	V1854	V1855	V1856	V1857	V1858	V1859	V1860	V1861	V1862	V1863	V1864	V1865	V1866	V1867	V1868	V1869	V1870	V1871	V1872	V1873	V1874	V1875	V1876	V1877	V1878	V1879	V1880	V1881	V1882	V1883	V1884	V1885	V1886	V1887	V1888	V1889	V1890	V1891	V1892	V1893	V1894	V1895	V1896	V1897	V1898	V1899	V1900	V1901	V1902	V1903	V1904	V1905	V1906	V1907	V1908	V1909	V1910	V1911	V1912	V1913	V1914	V1915	V1916	V1917	V1918	V1919	V1920	V1921	V1922	V1923	V1924	V1925	V1926	V1927	V1928	V1929	V1930	V1931	V1932	V1933	V1934	V1935	V1936	V1937	V1938	V1939	V1940	V1941	V1942	V1943	V1944	V1945	V1946	V1947	V1948	V1949	V1950	V1951	V1952	V1953	V1954	V1955	V1956	V1957	V1958	V1959	V1960	V1961	V1962	V1963	V1964	V1965	V1966	V1967	V1968	V1969	V1970	V1971	V1972	V1973	V1974	V1975	V1976	V1977	V1978	V1979	V1980	V1981	V1982	V1983	V1984	V1985	V1986	V1987	V1988	V1989	V1990	V1991	V1992	V1993	V1994	V1995	V1996	V1997	V1998	V1999	V2000	V2001	V2002	V2003	V2004	V2005	V2006	V2007	V2008	V2009	V2010	V2011	V2012	V2013	V2014	V2015	V2016	V2017	V2018	V2019	V2020	V2021	V2022	V2023	V2024	V2025	V2026	V2027	V2028	V2029	V2030	V2031	V2032	V2033	V2034	V2035	V2036	V2037	V2038	V2039	V2040	V2041	V2042	V2043	V2044	V2045	V2046	V2047	V2048	V2049	V2050	V2051	V2052	V2053	V2054	V2055	V2056	V2057	V2058	V2059	V2060	V2061	V2062	V2063	V2064	V2065	V2066	V2067	V2068	V2069	V2070	V2071	V2072	V2073	V2074	V2075	V2076	V2077	V2078	V2079	V2080	V2081	V2082	V2083	V2084	V2085	V2086	V2087	V2088	V2089	V2090	V2091	V2092	V2093	V2094	V2095	V2096	V2097	V2098	V2099	V2100	V2101	V2102	V2103	V2104	V2105	V2106	V2107	V2108	V2109	V2110	V2111	V2112	V2113	V2114	V2115	V2116	V2117	V2118	V2119	V2120	V2121	V2122	V2123	V2124	V2125	V2126	V2127	V2128	V2129	V2130	V2131	V2132	V2133	V2134	V2135	V2136	V2137	V2138	V2139	V2140	V2141	V2142	V2143	V2144	V2145	V2146	V2147	V2148	V2149	V2150	V2151	V2152	V2153	V2154	V2155	V2156	V2157	V2158	V2159	V2160	V2161	V2162	V2163	V2164	V2165	V2166	V2167	V2168	V2169	V2170	V2171	V2172	V2173	V2174	V2175	V2176	V2177	V2178	V2179	V2180	V2181	V2182	V2183	V2184	V2185	V2186	V2187	V2188	V2189	V2190	V2191	V2192	V2193	V2194	V2195	V2196	V2197	V2198	V2199	V2200	V2201	V2202	V2203	V2204	V2205	V2206	V2207	V2208	V2209	V2210	V2211	V2212	V2213	V2214	V2215	V2216	V2217	V2218	V2219	V2220	V2221	V2222	V2223	V2224	V2225	V2226	V2227	V2228	V2229	V2230	V2231	V2232	V2233	V2234	V2235	V2236	V2237	V2238	V2239	V2240	V2241	V2242	V2243	V2244	V2245	V2246	V2247	V2248	V2249	V2250	V2251	V2252	V2253	V2254	V2255	V2256	V2257	V2258	V2259	V2260	V2261	V2262	V2263	V2264	V2265	V2266	V2267	V2268	V2269	V2270	V2271	V2272	V2273	V2274	V2275	V2276	V2277	V2278	V2279	V2280	V2281	V2282	V2283	V2284	V2285	V2286	V2287	V2288	V2289	V2290	V2291	V2292	V2293	V2294	V2295	V2296	V2297	V2298	V2299	V2300	V2301	V2302	V2303	V2304	V2305	V2306	V2307	V2308	V2309	V2310	V2311	V2312	V2313	V2314	V2315	V2316	V2317	V2318	V2319	V2320	V2321	V2322	V2323	V2324	V2325	V2326	V2327	V2328	V2329	V2330	V2331	V2332	V2333	V2334	V2335	V2336	V2337	V2338	V2339	V2340	V2341	V2342	V2343	V2344	V2345	V2346	V2347	V2348	V2349	V2350	V2351	V2352	V2353	V2354	V2355	V2356	V2357	V2358	V2359	V2360	V2361	V2362	V2363	V2364	V2365	V2366	V2367	V2368	V2369	V2370	V2371	V2372	V2373	V2374	V2375	V2376	V2377	V2378	V2379	V2380	V2381	V2382	V2383	V2384	V2385	V2386	V2387	V2388	V2389	V2390	V2391	V2392	V2393	V2394	V2395	V2396	V2397	V2398	V2399	V2400	V2401	V2402	V2403	V2404	V2405	V2406	V2407	V2408	V2409	V2410	V2411	V2412	V2413	V2414	V2415	V2416	V2417	V2418	V2419	V2420	V2421	V2422	V2423	V2424	V2425	V2426	V2427	V2428	V2429	V2430	V2431	V2432	V2433	V2434	V2435	V2436	V2437	V2438	V2439	V2440	V2441	V2442	V2443	V2444	V2445	V2446	V2447	V2448	V2449	V2450	V2451	V2452	V2453	V2454	V2455	V2456	V2457	V2458	V2459	V2460	V2461	V2462	V2463	V2464	V2465	V2466	V2467	V2468	V2469	V2470	V2471	V2472	V2473	V2474	V2475	V2476	V2477	V2478	V2479	V2480	V2481	V2482	V2483	V2484	V2485	V2486	V2487	V2488	V2489	V2490	V2491	V2492	V2493	V2494	V2495	V2496	V2497	V2498	V2499	V2500	V2501	V2502	V2503	V2504	V2505	V2506	V2507	V2508	V2509	V2510	V2511	V2512	V2513	V2514	V2515	V2516	V2517	V2518	V2519	V2520	V2521	V2522	V2523	V2524	V2525	V2526	V2527	V2528	V2529	V2530	V2531	V2532	V2533	V2534	V2535	V2536	V2537	V2538	V2539	V2540	V2541	V2542	V2543	V2544	V2545	V2546	V2547	V2548	V2549	V2550	V2551	V2552	V2553	V2554	V2555	V2556	V2557	V2558	V2559	V2560	V2561	V2562	V2563	V2564	V2565	V2566	V2567	V2568	V2569	V2570	V2571	V2572	V2573	V2574	V2575	V2576	V2577	V2578	V2579	V2580	V2581	V2582	V2583	V2584	V2585	V2586	V2587	V2588	V2589	V2590	V2591	V2592	V2593	V2594	V2595	V2596	V2597	V2598	V2599	V2600	V2601	V2602	V2603	V2604	V2605	V2606	V2607	V2608	V2609	V2610	V2611	V2612	V2613	V2614	V2615	V2616	V2617	V2618	V2619	V2620	V2621	V2622	V2623	V2624	V2625	V2626	V2627	V2628	V2629	V2630	V2631	V2632	V2633	V2634	V2635	V2636	V2637	V2638	V2639	V2640	V2641	V2642	V2643	V2644	V2645	V2646	V2647	V2648	V2649	V2650	V2651	V2652	V2653	V2654	V2655	V2656	V2657	V2658	V2659	V2660	V2661	V2662	V2663	V2664	V2665	V2666	V2667	V2668	V2669	V2670	V2671	V2672	V2673	V2674	V2675	V2676	V2677	V2678	V2679	V2680	V2681	V2682	V2683	V2684	V2685	V2686	V2687	V2688	V2689	V2690	V2691	V2692	V2693	V2694	V2695	V2696	V2697	V2698	V2699	V2700	V2701	V2702	V2703	V2704	V2705	V2706	V2707	V2708	V2709	V2710	V2711	V2712	V2713	V2714	V2715	V2716	V2717	V2718	V2719	V2720	V2721	V2722	V2723	V2724	V2725	V2726	V2727	V2728	V2729	V2730	V2731	V2732	V2733	V2734	V2735	V2736	V2737	V2738	V2739	V2740	V2741	V2742	V2743	V2744	V2745	V2746	V2747	V2748	V2749	V2750	V2751	V2752	V2753	V2754	V2755	V2756	V2757	V2758	V2759	V2760	V2761	V2762	V2763	V2764	V2765	V2766	V2767	V2768	V2769	V2770	V2771	V2772	V2773	V2774	V2775	V2776	V2777	V2778	V2779	V2780	V2781	V2782	V2783	V2784	V2785	V2786	V2787	V2788	V2789	V2790	V2791	V2792	V2793	V2794	V2795	V2796	V2797	V2798	V2799	V2800	V2801	V2802	V2803	V2804	V2805	V2806	V2807	V2808	V2809	V2810	V2811	V2812	V2813	V2814	V2815	V2816	V2817	V2818	V2819	V2820	V2821	V2822	V2823	V2824	V2825	V2826	V2827	V2828	V2829	V2830	V2831	V2832	V2833	V2834	V2835	V2836	V2837	V2838	V2839	V2840	V2841	V2842	V2843	V2844	V2845	V2846	V2847	V2848	V2849	V



• Molecule 2: Ras-related protein Rab-12



• Molecule 2: Ras-related protein Rab-12



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	77265	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 ($e^-/\text{\AA}^2$)	77.6	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	130000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.547	Depositor
Minimum map value	-1.169	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.066	Depositor
Recommended contour level	0.5	Depositor
Map size (Å)	508.288, 508.288, 508.288	wwPDB
Map dimensions	352, 352, 352	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.444, 1.444, 1.444	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.34	0/15858	0.51	2/21732 (0.0%)
1	C	0.34	0/15871	0.51	2/21745 (0.0%)
2	B	0.32	0/1219	0.49	0/1662
2	D	0.32	0/1219	0.49	0/1662
All	All	0.34	0/34167	0.51	4/46801 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	C	0	2
All	All	0	4

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	213	THR	C-N-CA	-6.61	105.17	121.70
1	A	1042	LEU	CA-CB-CG	5.82	128.67	115.30
1	C	1042	LEU	CA-CB-CG	5.79	128.63	115.30
1	C	210	SER	C-N-CA	-5.39	108.22	121.70

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	209	LEU	Mainchain
1	A	986	SER	Peptide
1	C	172	ALA	Mainchain
1	C	986	SER	Peptide

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	15573	0	14262	245	0
1	C	15587	0	14299	255	0
2	B	1200	0	1080	25	0
2	D	1200	0	1080	24	0
3	A	28	0	12	0	0
3	C	28	0	12	0	0
4	A	31	0	13	1	0
4	C	31	0	13	2	0
5	B	1	0	0	0	0
5	D	1	0	0	0	0
6	B	32	0	13	3	0
6	D	32	0	13	2	0
All	All	33744	0	30797	551	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 9.

All (551) 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)
1:C:173:ASN:ND2	1:C:176:VAL:HG23	1.25	1.48
1:C:173:ASN:ND2	1:C:176:VAL:CG2	1.92	1.32
1:C:173:ASN:HD22	1:C:176:VAL:CG2	1.61	1.05
1:C:133:VAL:HG12	1:C:176:VAL:HG22	1.52	0.89
1:A:813:VAL:HG21	1:A:989:LEU:HD21	1.55	0.87
1:C:221:ILE:O	1:C:225:VAL:HG23	1.76	0.85
1:A:221:ILE:O	1:A:225:VAL:HG23	1.76	0.85
1:C:813:VAL:HG21	1:C:989:LEU:HD21	1.55	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:173:ASN:HD21	1:C:176:VAL:HG23	0.83	0.84
1:C:173:ASN:HD21	1:C:176:VAL:CG2	1.75	0.80
1:C:173:ASN:HD22	1:C:176:VAL:HG21	1.49	0.75
1:C:133:VAL:HG12	1:C:176:VAL:CG2	2.16	0.74
1:A:170:PHE:HB2	1:A:176:VAL:HG11	1.68	0.73
1:C:801:ASN:HB3	1:C:984:ILE:HA	1.71	0.71
1:A:801:ASN:HB3	1:A:984:ILE:HA	1.71	0.71
1:C:2220:GLN:NE2	1:C:2244:SER:CB	2.55	0.69
1:A:2220:GLN:NE2	1:A:2244:SER:CB	2.55	0.69
2:D:55:LYS:NZ	6:D:302:GNP:O3G	2.27	0.67
2:B:55:LYS:NZ	6:B:302:GNP:O3G	2.27	0.67
1:A:575:ASP:O	1:A:579:MET:N	2.28	0.67
1:C:1070:ILE:H	1:C:1093:ASN:HB3	1.61	0.66
1:A:1959:LEU:HD13	1:A:2070:GLY:HA3	1.77	0.66
1:A:1070:ILE:H	1:A:1093:ASN:HB3	1.60	0.66
1:C:1959:LEU:HD13	1:C:2070:GLY:HA3	1.77	0.65
1:A:1457:SER:HG	1:A:1463:LYS:N	1.95	0.65
1:C:173:ASN:ND2	1:C:176:VAL:CB	2.61	0.64
1:A:2238:LEU:HD12	1:A:2285:ALA:H	1.62	0.63
1:A:502:LEU:HD23	1:A:559:ILE:HG23	1.81	0.63
1:C:2238:LEU:HD12	1:C:2285:ALA:H	1.63	0.63
1:A:553:PHE:O	1:A:560:GLN:NE2	2.32	0.62
1:C:575:ASP:O	1:C:579:MET:N	2.28	0.62
1:A:990:SER:O	1:A:1021:ASN:ND2	2.33	0.62
1:C:502:LEU:HD23	1:C:559:ILE:HG23	1.81	0.62
1:C:990:SER:O	1:C:1021:ASN:ND2	2.33	0.62
1:C:1346:GLY:H	1:C:1452:THR:HG21	1.65	0.62
1:A:743:SER:OG	1:A:744:LEU:N	2.34	0.61
1:C:743:SER:OG	1:C:744:LEU:N	2.34	0.61
1:A:1346:GLY:H	1:A:1452:THR:HG21	1.65	0.61
1:C:553:PHE:O	1:C:560:GLN:NE2	2.32	0.61
1:C:807:GLY:HA2	1:C:991:ALA:HB3	1.81	0.60
1:A:807:GLY:HA2	1:A:991:ALA:HB3	1.82	0.60
1:C:1195:LEU:HD12	1:C:1198:LEU:HD12	1.83	0.60
1:A:350:LEU:HD22	1:A:384:LEU:HD12	1.83	0.60
1:C:1457:SER:HG	1:C:1463:LYS:N	1.99	0.60
1:C:1980:ASP:OD1	1:C:1983:ARG:NH2	2.35	0.60
1:A:230:HIS:O	1:A:276:ARG:NH1	2.35	0.60
1:C:350:LEU:HD22	1:C:384:LEU:HD12	1.83	0.60
1:A:713:LEU:HD22	1:A:733:ALA:HB1	1.84	0.60
2:B:48:ILE:HG13	2:B:120:LEU:HD13	1.84	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:48:ILE:HG13	2:D:120:LEU:HD13	1.84	0.60
1:C:992:ASN:O	1:C:1021:ASN:ND2	2.35	0.59
1:C:2272:LEU:HB3	1:C:2291:LEU:HB2	1.83	0.59
1:A:1195:LEU:HD12	1:A:1198:LEU:HD12	1.83	0.59
1:A:1980:ASP:OD1	1:A:1983:ARG:NH2	2.35	0.59
1:A:992:ASN:O	1:A:1021:ASN:ND2	2.35	0.59
1:C:713:LEU:HD22	1:C:733:ALA:HB1	1.84	0.59
1:C:792:ARG:NH2	1:C:820:PRO:O	2.36	0.59
1:A:2272:LEU:HB3	1:A:2291:LEU:HB2	1.83	0.59
1:C:1817:ASN:ND2	1:C:1820:GLU:O	2.35	0.59
1:A:792:ARG:NH2	1:A:820:PRO:O	2.36	0.59
1:C:230:HIS:O	1:C:276:ARG:NH1	2.35	0.58
1:A:1817:ASN:ND2	1:A:1820:GLU:O	2.35	0.58
1:C:1062:ASN:HA	1:C:1087:GLN:HB2	1.85	0.58
1:C:2107:VAL:HB	1:C:2137:LEU:HD11	1.85	0.58
1:C:1695:TYR:HB2	1:C:1763:LEU:HB3	1.86	0.58
1:A:1062:ASN:HA	1:A:1087:GLN:HB2	1.85	0.58
1:C:2238:LEU:HA	1:C:2284:GLY:H	1.69	0.58
1:A:2107:VAL:HB	1:A:2137:LEU:HD11	1.85	0.58
1:A:1283:SER:HA	1:A:1305:ASN:HD21	1.68	0.58
1:A:1695:TYR:HB2	1:A:1763:LEU:HB3	1.86	0.58
1:C:1041:ASP:N	1:C:1041:ASP:OD1	2.37	0.57
1:A:1041:ASP:N	1:A:1041:ASP:OD1	2.37	0.57
1:A:2374:GLU:HB3	1:A:2383:LEU:HD21	1.86	0.57
1:A:2238:LEU:HA	1:A:2284:GLY:H	1.69	0.57
1:A:1433:PRO:O	1:A:1437:ASN:ND2	2.36	0.57
1:C:1283:SER:HA	1:C:1305:ASN:HD21	1.68	0.57
1:C:1433:PRO:O	1:C:1437:ASN:ND2	2.36	0.57
1:C:2374:GLU:HB3	1:C:2383:LEU:HD21	1.86	0.57
1:A:1929:HIS:HB3	1:A:1932:LEU:HD23	1.86	0.57
1:C:1287:GLU:O	1:C:1290:LYS:NZ	2.36	0.57
1:C:1929:HIS:HB3	1:C:1932:LEU:HD23	1.86	0.57
1:A:426:LEU:O	1:A:433:ARG:NH2	2.38	0.57
1:C:426:LEU:O	1:C:433:ARG:NH2	2.38	0.57
1:C:1146:GLU:HA	1:C:1169:PRO:HB2	1.87	0.56
1:A:1373:VAL:HB	1:A:1601:LYS:HB3	1.86	0.56
1:A:2151:ILE:H	1:A:2173:HIS:HB3	1.70	0.56
4:A:2602:ANP:O2A	4:A:2602:ANP:O1B	2.23	0.56
1:C:173:ASN:HD22	1:C:176:VAL:CB	2.16	0.56
1:C:1373:VAL:HB	1:C:1601:LYS:HB3	1.86	0.56
1:C:1512:LYS:HA	1:C:1517:LEU:H	1.70	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2151:ILE:H	1:C:2173:HIS:HB3	1.70	0.56
1:A:2322:LYS:HG3	1:A:2337:GLU:HA	1.88	0.56
1:C:2151:ILE:O	1:C:2172:GLY:N	2.33	0.56
1:C:793:ARG:O	1:C:793:ARG:NH1	2.37	0.56
1:A:1177:ILE:HG22	1:A:1200:SER:HB3	1.88	0.56
1:A:1146:GLU:HA	1:A:1169:PRO:HB2	1.87	0.56
1:A:316:LEU:HB3	1:A:349:TRP:HE1	1.70	0.55
1:C:1772:LYS:HA	1:C:1775:ILE:HD12	1.88	0.55
1:A:2289:LYS:NZ	1:A:2330:PHE:O	2.37	0.55
1:C:2322:LYS:HG3	1:C:2337:GLU:HA	1.88	0.55
1:A:194:GLU:O	1:A:198:GLU:N	2.40	0.55
1:C:194:GLU:O	1:C:198:GLU:N	2.40	0.55
1:C:316:LEU:HB3	1:C:349:TRP:HE1	1.70	0.55
1:A:211:ALA:CB	1:A:225:VAL:HG21	2.36	0.55
1:A:1772:LYS:HA	1:A:1775:ILE:HD12	1.88	0.55
1:C:230:HIS:HA	1:C:273:LEU:HD13	1.87	0.55
1:C:737:GLN:HE21	1:C:744:LEU:HD13	1.72	0.55
1:C:744:LEU:O	1:C:748:VAL:HG23	2.07	0.55
1:C:2458:MET:HG3	1:C:2472:VAL:HG22	1.87	0.55
1:A:2458:MET:HG3	1:A:2472:VAL:HG22	1.87	0.55
4:C:2602:ANP:O1B	4:C:2602:ANP:O2A	2.23	0.55
1:A:210:SER:O	1:A:214:ASN:N	2.34	0.55
1:A:495:GLU:OE1	1:A:495:GLU:N	2.33	0.55
1:A:1512:LYS:HA	1:A:1517:LEU:H	1.70	0.55
1:C:1177:ILE:HG22	1:C:1200:SER:HB3	1.88	0.55
1:A:548:ALA:HA	1:A:551:ASN:HD22	1.72	0.55
1:A:737:GLN:HE21	1:A:744:LEU:HD13	1.72	0.55
1:C:1541:VAL:HG21	1:C:1548:ILE:HD11	1.89	0.55
1:A:230:HIS:HA	1:A:273:LEU:HD13	1.87	0.54
1:A:1871:ASN:ND2	1:A:1873:ASP:OD1	2.40	0.54
1:C:548:ALA:HA	1:C:551:ASN:HD22	1.72	0.54
1:C:1871:ASN:ND2	1:C:1873:ASP:OD1	2.40	0.54
1:C:2289:LYS:NZ	1:C:2330:PHE:O	2.37	0.54
1:A:2263:LEU:HB3	1:A:2275:PHE:HB2	1.90	0.54
1:A:538:PHE:HE1	1:A:543:HIS:HB3	1.73	0.54
1:A:744:LEU:O	1:A:748:VAL:HG23	2.06	0.54
1:A:1394:ASP:OD1	1:A:1394:ASP:N	2.40	0.54
1:A:1415:TYR:HB2	1:A:1447:VAL:HG22	1.90	0.54
2:B:59:MET:HG2	2:B:80:LYS:HD2	1.90	0.54
1:C:1415:TYR:HB2	1:C:1447:VAL:HG22	1.90	0.53
1:C:2263:LEU:HB3	1:C:2275:PHE:HB2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1956:ASP:HB3	1:C:1997:PRO:HB2	1.90	0.53
1:A:1044:SER:H	1:A:1067:ARG:HB2	1.72	0.53
1:A:2299:PRO:HD2	1:A:2353:ASN:HD21	1.74	0.53
1:C:1044:SER:H	1:C:1067:ARG:HB2	1.72	0.53
1:C:1260:ILE:HG12	1:C:1281:LEU:HD11	1.91	0.53
1:C:1394:ASP:OD1	1:C:1394:ASP:N	2.40	0.53
1:A:1368:THR:O	1:A:1398:ARG:NH2	2.40	0.53
1:A:1956:ASP:HB3	1:A:1997:PRO:HB2	1.90	0.53
1:A:2352:SER:OG	1:A:2353:ASN:N	2.42	0.53
1:A:1052:SER:OG	1:A:1077:ASP:OD1	2.27	0.53
1:A:1541:VAL:HG21	1:A:1548:ILE:HD11	1.89	0.53
2:B:126:LYS:O	2:B:129:THR:OG1	2.21	0.53
1:C:2299:PRO:HD2	1:C:2353:ASN:HD21	1.73	0.53
1:C:1368:THR:O	1:C:1398:ARG:NH2	2.40	0.53
1:C:1448:ILE:HG23	1:C:1484:ASP:HB3	1.90	0.53
2:D:85:GLU:HA	2:D:90:LYS:HA	1.91	0.53
2:D:134:PRO:O	2:D:138:LYS:N	2.42	0.53
1:A:1448:ILE:HG23	1:A:1484:ASP:HB3	1.90	0.53
2:B:193:VAL:HA	2:B:196:ILE:HD12	1.91	0.53
2:D:59:MET:HG2	2:D:80:LYS:HD2	1.90	0.52
1:A:1043:HIS:O	1:A:1045:ASN:ND2	2.43	0.52
1:C:1317:ASP:OD1	1:C:1317:ASP:N	2.41	0.52
2:B:60:GLU:O	2:B:65:ASP:N	2.42	0.52
1:C:173:ASN:ND2	1:C:176:VAL:HG21	2.06	0.52
1:C:2352:SER:OG	1:C:2353:ASN:N	2.42	0.52
1:A:1317:ASP:OD1	1:A:1317:ASP:N	2.41	0.52
1:A:2151:ILE:O	1:A:2172:GLY:N	2.33	0.52
2:B:85:GLU:HA	2:B:90:LYS:HA	1.91	0.52
2:B:134:PRO:O	2:B:138:LYS:N	2.42	0.52
1:A:211:ALA:HB1	1:A:225:VAL:HG21	1.91	0.52
1:A:1260:ILE:HG12	1:A:1281:LEU:HD11	1.91	0.52
1:C:1004:CYS:SG	1:C:1005:CYS:N	2.83	0.52
1:C:1863:ASP:OD1	1:C:1863:ASP:N	2.42	0.52
2:D:60:GLU:O	2:D:65:ASP:N	2.42	0.52
2:D:193:VAL:HA	2:D:196:ILE:HD12	1.91	0.52
2:B:41:PHE:O	2:B:92:ARG:N	2.37	0.52
1:A:762:LEU:HD11	1:A:790:LEU:HD23	1.91	0.52
1:A:1375:ASP:OD1	1:A:1375:ASP:N	2.43	0.52
1:C:762:LEU:HD11	1:C:790:LEU:HD23	1.91	0.52
2:D:126:LYS:O	2:D:129:THR:OG1	2.21	0.52
1:A:2291:LEU:HD22	1:A:2293:ILE:HD11	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1863:ASP:OD1	1:A:1863:ASP:N	2.42	0.51
1:C:1882:GLU:HG3	1:C:1885:LEU:HD23	1.92	0.51
1:A:1190:GLU:O	1:A:1194:ASN:ND2	2.43	0.51
1:A:2300:LEU:HD21	1:A:2303:LEU:HD21	1.93	0.51
1:C:133:VAL:CG1	1:C:176:VAL:CG2	2.88	0.51
1:C:1375:ASP:OD1	1:C:1375:ASP:N	2.43	0.51
1:C:2291:LEU:HD22	1:C:2293:ILE:HD11	1.92	0.51
1:A:748:VAL:HG21	1:A:761:LEU:HD22	1.92	0.51
1:C:1052:SER:OG	1:C:1077:ASP:OD1	2.27	0.51
1:A:2318:GLY:HA3	1:A:2354:ILE:HD13	1.93	0.51
1:A:2453:ASN:OD1	1:A:2477:ARG:N	2.41	0.51
1:C:416:GLN:OE1	1:C:420:ASN:ND2	2.44	0.51
1:C:667:VAL:O	1:C:715:ARG:NH2	2.44	0.51
1:C:1190:GLU:O	1:C:1194:ASN:ND2	2.43	0.51
1:C:2300:LEU:HD21	1:C:2303:LEU:HD21	1.93	0.51
1:C:2318:GLY:HA3	1:C:2354:ILE:HD13	1.93	0.51
1:A:219:GLU:HG3	1:A:266:ILE:HD11	1.93	0.51
1:C:1043:HIS:O	1:C:1045:ASN:ND2	2.43	0.51
1:A:1287:GLU:O	1:A:1290:LYS:NZ	2.36	0.51
1:C:2293:ILE:HD12	1:C:2332:ILE:HD11	1.93	0.51
1:A:667:VAL:O	1:A:715:ARG:NH2	2.44	0.51
1:C:1077:ASP:OD1	1:C:1077:ASP:N	2.44	0.51
1:C:2304:SER:OG	1:C:2357:VAL:O	2.29	0.51
1:A:416:GLN:OE1	1:A:420:ASN:ND2	2.44	0.50
1:A:488:LEU:HD11	1:A:542:ILE:HG12	1.93	0.50
1:A:2304:SER:OG	1:A:2357:VAL:O	2.29	0.50
1:C:538:PHE:HE1	1:C:543:HIS:HB3	1.73	0.50
1:A:1004:CYS:SG	1:A:1005:CYS:N	2.83	0.50
1:C:1255:ASN:O	1:C:1278:ASN:ND2	2.45	0.50
1:C:2413:ARG:O	1:C:2430:GLY:N	2.45	0.50
2:D:41:PHE:O	2:D:92:ARG:N	2.37	0.50
1:C:488:LEU:HD11	1:C:542:ILE:HG12	1.93	0.50
1:A:1882:GLU:HG3	1:A:1885:LEU:HD23	1.92	0.50
1:A:2219:THR:HG23	1:A:2221:SER:H	1.77	0.50
1:C:748:VAL:HG21	1:C:761:LEU:HD22	1.92	0.50
1:A:2413:ARG:O	1:A:2430:GLY:N	2.45	0.50
1:A:1255:ASN:O	1:A:1278:ASN:ND2	2.45	0.50
1:C:2219:THR:HG23	1:C:2221:SER:H	1.77	0.50
1:C:495:GLU:OE1	1:C:495:GLU:N	2.33	0.49
1:A:2293:ILE:HD12	1:A:2332:ILE:HD11	1.93	0.49
1:C:1375:ASP:HA	1:C:1391:ASN:HA	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:137:MET:HA	2:B:140:ILE:HB	1.95	0.49
1:C:12:ASP:O	1:C:15:THR:OG1	2.30	0.49
1:C:607:LEU:HD21	1:C:648:GLY:HA2	1.94	0.49
1:A:1077:ASP:OD1	1:A:1077:ASP:N	2.44	0.49
1:A:706:ASP:O	1:A:710:ASN:ND2	2.46	0.49
1:A:1733:TYR:HB3	1:A:1738:ILE:HA	1.95	0.49
2:D:137:MET:HA	2:D:140:ILE:HB	1.95	0.49
1:A:1694:LEU:HB2	1:A:1811:TRP:HB2	1.95	0.49
2:B:168:GLN:O	2:B:172:LYS:N	2.44	0.49
1:A:793:ARG:O	1:A:793:ARG:NH1	2.37	0.49
1:A:1369:VAL:HG22	1:A:1398:ARG:HH22	1.78	0.49
1:A:1375:ASP:HA	1:A:1391:ASN:HA	1.95	0.49
1:C:2141:THR:OG1	1:C:2495:VAL:O	2.31	0.49
1:C:219:GLU:HG3	1:C:266:ILE:HD11	1.93	0.48
1:C:1694:LEU:HB2	1:C:1811:TRP:HB2	1.95	0.48
1:C:2327:SER:OG	1:C:2328:ASN:N	2.46	0.48
1:C:137:LYS:HA	1:C:179:LEU:HD13	1.95	0.48
1:A:1905:VAL:HG12	1:A:1946:VAL:HG22	1.94	0.48
1:C:706:ASP:O	1:C:710:ASN:ND2	2.46	0.48
1:A:2249:TYR:N	1:A:2264:LEU:O	2.45	0.48
1:C:1733:TYR:HB3	1:C:1738:ILE:HA	1.95	0.48
1:A:1419:TYR:HB2	1:A:1451:GLY:HA2	1.96	0.48
1:A:1439:LYS:HB2	1:A:1480:PRO:HD3	1.95	0.48
1:C:1905:VAL:HG12	1:C:1946:VAL:HG22	1.94	0.48
1:C:1455:ASP:OD1	1:C:1455:ASP:N	2.46	0.48
1:C:1980:ASP:OD2	1:C:2514:ARG:NH1	2.47	0.48
1:C:2124:THR:HG23	1:C:2127:GLN:H	1.79	0.48
1:A:1870:LEU:HB2	1:A:1939:GLY:HA3	1.95	0.48
1:A:2492:CYS:SG	1:A:2493:LEU:N	2.87	0.48
1:C:149:THR:HA	1:C:152:ILE:HD12	1.95	0.48
1:C:1393:TRP:HZ3	1:C:1408:PHE:HB3	1.79	0.48
1:A:1980:ASP:OD2	1:A:2514:ARG:NH1	2.47	0.48
1:C:2321:THR:O	1:C:2338:THR:OG1	2.31	0.48
1:A:435:ILE:O	1:A:439:LYS:N	2.46	0.48
1:C:1870:LEU:HB2	1:C:1939:GLY:HA3	1.95	0.48
1:A:607:LEU:HD21	1:A:648:GLY:HA2	1.94	0.48
1:C:512:ILE:HD11	1:C:566:VAL:HG13	1.95	0.48
1:C:1369:VAL:HG22	1:C:1398:ARG:HH22	1.78	0.48
1:A:2321:THR:O	1:A:2338:THR:OG1	2.31	0.47
1:C:2249:TYR:N	1:C:2264:LEU:O	2.45	0.47
1:A:182:LYS:O	1:A:185:HIS:HB3	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2220:GLN:HE21	1:A:2244:SER:CB	2.26	0.47
1:A:2390:VAL:HA	1:A:2393:LEU:HG	1.97	0.47
1:C:1439:LYS:HB2	1:C:1480:PRO:HD3	1.95	0.47
1:C:2302:CYS:SG	1:C:2303:LEU:N	2.87	0.47
1:A:86:CYS:HB2	1:A:138:THR:HG22	1.96	0.47
1:A:2321:THR:OG1	1:A:2352:SER:O	2.21	0.47
1:A:2327:SER:OG	1:A:2328:ASN:N	2.46	0.47
1:A:149:THR:HA	1:A:152:ILE:HD12	1.95	0.47
1:A:460:GLU:HG2	1:A:500:VAL:HA	1.96	0.47
1:A:1333:ASN:ND2	1:A:1519:VAL:O	2.43	0.47
1:A:2302:CYS:SG	1:A:2303:LEU:N	2.87	0.47
1:C:435:ILE:O	1:C:439:LYS:N	2.47	0.47
1:C:2492:CYS:SG	1:C:2493:LEU:N	2.87	0.47
1:C:2499:ASN:OD1	1:C:2502:HIS:ND1	2.44	0.47
1:A:12:ASP:O	1:A:15:THR:OG1	2.30	0.47
1:A:512:ILE:HD11	1:A:566:VAL:HG13	1.95	0.47
1:A:1393:TRP:HZ3	1:A:1408:PHE:HB3	1.79	0.47
1:A:1058:SER:OG	1:A:1059:CYS:N	2.47	0.47
1:C:204:ASP:O	1:C:208:LEU:HG	2.14	0.47
1:C:460:GLU:HG2	1:C:500:VAL:HA	1.96	0.47
1:C:1419:TYR:HB2	1:C:1451:GLY:HA2	1.95	0.47
1:C:2220:GLN:HE21	1:C:2244:SER:CB	2.26	0.47
1:A:1341:GLY:O	1:A:1434:TRP:NE1	2.48	0.47
1:A:2295:ASN:N	1:A:2298:THR:OG1	2.44	0.47
2:B:168:GLN:HG3	2:B:172:LYS:HD3	1.97	0.47
1:C:208:LEU:HD21	1:C:229:LEU:HD21	1.97	0.47
2:D:58:LEU:HG	2:D:187:ALA:HB2	1.97	0.47
2:D:168:GLN:HG3	2:D:172:LYS:HD3	1.97	0.47
1:C:2390:VAL:HA	1:C:2393:LEU:HG	1.96	0.47
1:A:1920:GLU:HG2	1:A:2021:ALA:HB1	1.97	0.47
1:C:86:CYS:HB2	1:C:138:THR:HG22	1.96	0.47
1:C:1341:GLY:O	1:C:1434:TRP:NE1	2.48	0.47
1:C:2295:ASN:N	1:C:2298:THR:OG1	2.44	0.47
1:C:2453:ASN:OD1	1:C:2477:ARG:N	2.40	0.47
2:B:53:VAL:N	6:B:302:GNP:O1B	2.47	0.46
1:C:1058:SER:OG	1:C:1059:CYS:N	2.47	0.46
1:A:1339:ILE:HB	1:A:1394:ASP:HA	1.96	0.46
1:A:2499:ASN:OD1	1:A:2502:HIS:ND1	2.44	0.46
1:C:133:VAL:CG1	1:C:176:VAL:HG22	2.33	0.46
2:D:127:LYS:O	2:D:131:ASP:N	2.48	0.46
1:A:1455:ASP:OD1	1:A:1455:ASP:N	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2110:LEU:HD11	1:A:2128:VAL:HG23	1.98	0.46
2:B:58:LEU:HG	2:B:187:ALA:HB2	1.97	0.46
2:B:169:GLN:O	2:B:173:PHE:N	2.49	0.46
1:A:1909:ASN:N	1:A:1909:ASN:OD1	2.48	0.46
1:A:2124:THR:HG23	1:A:2127:GLN:H	1.79	0.46
2:B:61:ARG:HH21	2:B:190:ASN:HB2	1.81	0.46
2:D:82:LYS:O	2:D:93:LEU:N	2.47	0.46
1:A:1347:LYS:NZ	1:A:1395:PHE:O	2.42	0.46
2:D:201:VAL:HA	2:D:204:ILE:HB	1.97	0.46
1:C:566:VAL:O	1:C:569:SER:OG	2.21	0.46
1:C:1339:ILE:HB	1:C:1394:ASP:HA	1.96	0.46
1:A:2332:ILE:HD13	1:A:2335:LEU:HD13	1.98	0.46
1:C:1441:ARG:NH1	1:C:1791:TRP:O	2.49	0.46
1:C:1755:LEU:HB3	1:C:1758:HIS:HB2	1.98	0.46
1:C:1920:GLU:HG2	1:C:2021:ALA:HB1	1.97	0.46
1:C:585:ALA:O	1:C:588:SER:OG	2.34	0.45
1:C:1090:LEU:HD12	1:C:1090:LEU:HA	1.84	0.45
1:C:2169:LEU:O	1:C:2180:SER:N	2.42	0.45
2:D:61:ARG:HH21	2:D:190:ASN:HB2	1.81	0.45
2:B:201:VAL:HA	2:B:204:ILE:HB	1.97	0.45
1:C:1601:LYS:HE3	1:C:1601:LYS:HB2	1.76	0.45
1:C:2110:LEU:HD11	1:C:2128:VAL:HG23	1.98	0.45
1:C:2291:LEU:HD23	1:C:2291:LEU:HA	1.85	0.45
1:A:987:LEU:HB3	1:A:1013:LEU:HD21	1.98	0.45
1:C:2214:TRP:HE1	1:C:2280:VAL:HG12	1.81	0.45
2:D:168:GLN:O	2:D:172:LYS:N	2.44	0.45
1:A:990:SER:OG	1:A:991:ALA:N	2.50	0.45
1:A:2183:ASP:HB3	1:A:2188:GLY:H	1.81	0.45
1:C:1092:TYR:HB3	1:C:1883:PHE:CE2	2.52	0.45
1:A:1755:LEU:HB3	1:A:1758:HIS:HB2	1.98	0.45
1:A:1845:GLN:HB2	1:A:1847:ARG:HD2	1.97	0.45
1:C:1377:PRO:HA	1:C:1389:VAL:HA	1.99	0.45
1:C:2183:ASP:HB3	1:C:2188:GLY:H	1.81	0.45
1:C:2220:GLN:HE22	1:C:2244:SER:CB	2.30	0.45
1:A:320:THR:HA	1:A:323:ILE:HG22	1.98	0.45
1:A:1116:GLY:HA2	1:A:1138:LYS:HB2	1.99	0.45
1:A:1090:LEU:HD12	1:A:1090:LEU:HA	1.84	0.45
1:A:2143:ARG:HG2	1:A:2494:THR:HG22	1.99	0.45
1:C:187:LEU:HD12	1:C:187:LEU:HA	1.83	0.45
1:C:987:LEU:HB3	1:C:1013:LEU:HD21	1.98	0.45
1:C:1034:LEU:HD13	1:C:1037:LEU:HD11	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2248:LEU:HD23	1:C:2263:LEU:HD21	1.98	0.45
1:A:1034:LEU:HD13	1:A:1037:LEU:HD11	1.99	0.45
1:C:990:SER:OG	1:C:991:ALA:N	2.50	0.45
1:A:460:GLU:HB2	1:A:500:VAL:HG12	1.99	0.45
1:A:1506:ASN:O	1:A:1510:ASN:ND2	2.49	0.45
1:A:2248:LEU:HD23	1:A:2263:LEU:HD21	1.98	0.45
1:C:320:THR:HA	1:C:323:ILE:HG22	1.99	0.45
1:C:2302:CYS:SG	1:C:2304:SER:OG	2.73	0.45
1:C:985:THR:O	1:C:985:THR:OG1	2.28	0.44
1:C:1116:GLY:HA2	1:C:1138:LYS:HB2	1.99	0.44
1:C:1225:LEU:HB3	1:C:1227:PHE:HE2	1.82	0.44
1:C:2143:ARG:HG2	1:C:2494:THR:HG22	1.99	0.44
1:C:1388:LEU:HD21	1:C:1390:LEU:HD23	1.99	0.44
1:C:1845:GLN:HB2	1:C:1847:ARG:HD2	1.97	0.44
1:C:1909:ASN:OD1	1:C:1909:ASN:N	2.48	0.44
1:A:1092:TYR:HB3	1:A:1883:PHE:CE2	2.52	0.44
1:A:1441:ARG:NH1	1:A:1791:TRP:O	2.49	0.44
1:A:1956:ASP:N	1:A:1956:ASP:OD1	2.50	0.44
1:C:729:LEU:HD23	1:C:733:ALA:HB3	1.99	0.44
1:C:1833:LYS:HD3	1:C:1859:LEU:HD22	1.99	0.44
2:D:53:VAL:N	6:D:302:GNP:O1B	2.47	0.44
1:A:285:ILE:HG23	1:A:291:VAL:HG11	1.99	0.44
1:A:1225:LEU:HB3	1:A:1227:PHE:HE2	1.82	0.44
1:C:1642:PRO:N	1:C:1645:TYR:HH	2.16	0.44
1:C:2332:ILE:HD13	1:C:2335:LEU:HD13	1.98	0.44
2:D:169:GLN:O	2:D:173:PHE:N	2.49	0.44
1:A:1833:LYS:HD3	1:A:1859:LEU:HD22	1.99	0.44
1:A:2214:TRP:HE1	1:A:2280:VAL:HG12	1.81	0.44
1:C:150:LEU:HA	1:C:153:LEU:HD12	1.99	0.44
1:C:285:ILE:HG23	1:C:291:VAL:HG11	1.99	0.44
1:C:295:VAL:O	1:C:299:VAL:HG23	2.18	0.44
1:C:499:PRO:HA	1:C:502:LEU:HB2	2.00	0.44
1:C:1506:ASN:O	1:C:1510:ASN:ND2	2.49	0.44
1:A:2372:VAL:HA	1:A:2388:ASP:HA	2.00	0.44
2:B:82:LYS:O	2:B:93:LEU:N	2.47	0.44
1:A:681:SER:O	1:A:685:GLU:N	2.43	0.44
1:A:1337:LEU:HD22	1:A:1392:VAL:HG12	2.00	0.44
1:A:1684:HIS:HD2	1:A:1689:GLU:HG3	1.82	0.44
1:A:2435:LEU:HD13	1:A:2447:VAL:HG22	2.00	0.44
1:C:2219:THR:OG1	1:C:2220:GLN:N	2.51	0.44
1:A:203:LYS:C	1:A:205:TYR:N	2.70	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1755:LEU:HD12	1:C:1755:LEU:HA	1.83	0.44
1:A:209:LEU:O	1:A:210:SER:C	2.56	0.44
1:A:2272:LEU:HD23	1:A:2291:LEU:HD12	2.00	0.44
1:C:1885:LEU:HD13	1:C:1894:TYR:CZ	2.53	0.44
1:A:499:PRO:HA	1:A:502:LEU:HB2	2.00	0.43
1:A:2219:THR:OG1	1:A:2220:GLN:N	2.51	0.43
2:B:73:SER:OG	6:B:302:GNP:O1G	2.22	0.43
1:C:460:GLU:HB2	1:C:500:VAL:HG12	1.99	0.43
1:C:667:VAL:HA	1:C:671:PHE:H	1.83	0.43
1:C:809:CYS:HA	1:C:992:ASN:HA	2.00	0.43
1:C:1956:ASP:OD1	1:C:1956:ASP:N	2.50	0.43
1:A:429:ASN:OD1	1:A:430:VAL:N	2.51	0.43
1:A:1701:PRO:HG2	1:A:1704:PHE:HB2	1.99	0.43
1:A:1885:LEU:HD13	1:A:1894:TYR:CZ	2.53	0.43
1:A:2220:GLN:HE22	1:A:2244:SER:CB	2.30	0.43
1:C:1337:LEU:HD22	1:C:1392:VAL:HG12	2.00	0.43
1:C:1684:HIS:HD2	1:C:1689:GLU:HG3	1.82	0.43
1:C:1701:PRO:HG2	1:C:1704:PHE:HB2	1.99	0.43
1:A:1748:CYS:SG	1:A:1749:LEU:N	2.91	0.43
1:C:2321:THR:OG1	1:C:2352:SER:O	2.21	0.43
1:A:729:LEU:HD23	1:A:733:ALA:HB3	1.99	0.43
1:A:1377:PRO:HA	1:A:1389:VAL:HA	1.99	0.43
1:C:736:ASN:OD1	1:C:767:ARG:N	2.50	0.43
1:C:2125:SER:HA	1:C:2128:VAL:HG12	2.01	0.43
1:C:2435:LEU:HD13	1:C:2447:VAL:HG22	2.00	0.43
1:A:809:CYS:HA	1:A:992:ASN:HA	2.00	0.43
1:C:429:ASN:OD1	1:C:430:VAL:N	2.51	0.43
1:C:1333:ASN:ND2	1:C:1519:VAL:O	2.43	0.43
1:A:150:LEU:HA	1:A:153:LEU:HD12	1.99	0.43
1:A:1286:ASN:HA	1:A:1322:LEU:HD12	2.00	0.43
1:C:744:LEU:HD12	1:C:744:LEU:HA	1.89	0.43
1:C:803:ILE:N	1:C:986:SER:OG	2.45	0.43
1:C:1286:ASN:HA	1:C:1322:LEU:HD12	2.00	0.43
1:A:201:GLU:HG3	1:A:202:ASN:H	1.83	0.43
1:A:1388:LEU:HD21	1:A:1390:LEU:HD23	1.99	0.43
1:C:408:HIS:HB2	1:C:414:VAL:HG11	2.01	0.43
1:C:1748:CYS:SG	1:C:1749:LEU:N	2.91	0.43
1:C:1873:ASP:OD1	1:C:1873:ASP:N	2.52	0.43
1:A:274:LEU:HD23	1:A:274:LEU:HA	1.85	0.43
1:A:295:VAL:O	1:A:299:VAL:HG23	2.18	0.43
1:A:667:VAL:HA	1:A:671:PHE:H	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1147:ASN:OD1	1:A:1147:ASN:N	2.50	0.43
1:A:2291:LEU:HD21	1:A:2331:THR:HA	2.01	0.43
1:C:1251:HIS:HA	1:C:1274:ASP:HB3	2.00	0.43
1:C:2204:LEU:HA	1:C:2215:ILE:HA	2.01	0.43
2:D:42:LYS:HA	2:D:92:ARG:HB3	2.01	0.43
1:A:1642:PRO:N	1:A:1645:TYR:HH	2.16	0.43
2:B:127:LYS:O	2:B:131:ASP:N	2.48	0.43
1:C:1378:ILE:HG12	1:C:1505:ILE:HD11	2.01	0.43
1:C:2372:VAL:HA	1:C:2388:ASP:HA	2.00	0.43
1:A:408:HIS:HB2	1:A:414:VAL:HG11	2.01	0.43
1:A:1237:LEU:HD12	1:A:1237:LEU:HA	1.93	0.43
1:A:2204:LEU:HA	1:A:2215:ILE:HA	2.01	0.43
1:C:1833:LYS:HA	1:C:1833:LYS:HD2	1.94	0.43
1:C:2272:LEU:HD23	1:C:2291:LEU:HD12	2.00	0.43
1:A:1747:TYR:CZ	1:A:1768:PRO:HD3	2.54	0.42
1:C:1092:TYR:CD1	1:C:1116:GLY:HA3	2.54	0.42
1:C:1747:TYR:CZ	1:C:1768:PRO:HD3	2.54	0.42
1:A:212:LEU:HD13	1:A:251:ASN:HD22	1.83	0.42
1:A:2125:SER:HA	1:A:2128:VAL:HG12	2.01	0.42
2:B:42:LYS:HA	2:B:92:ARG:HB3	2.01	0.42
1:A:578:GLU:O	1:A:582:LEU:N	2.52	0.42
1:A:736:ASN:OD1	1:A:767:ARG:N	2.50	0.42
1:A:2302:CYS:SG	1:A:2304:SER:OG	2.73	0.42
1:C:1912:THR:O	1:C:1943:ARG:NH2	2.43	0.42
1:A:1092:TYR:CD1	1:A:1116:GLY:HA3	2.54	0.42
1:A:2040:ALA:HB3	1:A:2043:VAL:HG23	2.02	0.42
1:C:2476:ASN:N	1:C:2490:GLN:O	2.52	0.42
1:A:1007:SER:HA	1:A:1010:LEU:HB2	2.01	0.42
1:A:1491:THR:OG1	1:A:1492:GLU:OE1	2.38	0.42
1:A:2476:ASN:N	1:A:2490:GLN:O	2.52	0.42
1:C:316:LEU:HD23	1:C:316:LEU:HA	1.85	0.42
2:D:124:ILE:O	2:D:164:GLU:N	2.46	0.42
1:A:585:ALA:O	1:A:588:SER:OG	2.34	0.42
1:A:713:LEU:CD1	1:A:725:VAL:HG13	2.49	0.42
1:A:1251:HIS:HA	1:A:1274:ASP:HB3	2.00	0.42
1:C:1998:HIS:NE2	4:C:2602:ANP:O2B	2.42	0.42
1:C:2291:LEU:HD21	1:C:2331:THR:HA	2.01	0.42
1:A:212:LEU:HG	1:A:225:VAL:HG11	2.02	0.42
1:A:566:VAL:O	1:A:569:SER:OG	2.21	0.42
1:A:1601:LYS:HE3	1:A:1601:LYS:HB2	1.76	0.42
1:A:1755:LEU:HD12	1:A:1755:LEU:HA	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1010:LEU:HD23	1:C:1010:LEU:HA	1.89	0.42
1:A:2429:THR:HG21	1:A:2433:HIS:HB2	2.02	0.42
1:A:220:GLU:O	1:A:224:HIS:ND1	2.38	0.42
1:A:316:LEU:HD23	1:A:316:LEU:HA	1.85	0.42
2:B:124:ILE:O	2:B:164:GLU:N	2.46	0.42
1:C:713:LEU:CD1	1:C:725:VAL:HG13	2.49	0.42
1:C:1128:LEU:HD23	1:C:1128:LEU:HA	1.94	0.42
1:C:1347:LYS:NZ	1:C:1395:PHE:O	2.42	0.42
1:C:1843:PRO:HD2	1:C:1848:LEU:O	2.20	0.42
1:C:2040:ALA:HB3	1:C:2043:VAL:HG23	2.02	0.42
1:A:2146:LEU:HD23	1:A:2146:LEU:HA	1.85	0.41
1:A:2169:LEU:O	1:A:2180:SER:N	2.42	0.41
2:B:169:GLN:HA	2:B:172:LYS:HB2	2.02	0.41
1:A:122:LEU:HA	1:A:122:LEU:HD23	1.87	0.41
1:A:1843:PRO:HD2	1:A:1848:LEU:O	2.20	0.41
1:A:2251:ASN:OD1	1:A:2251:ASN:N	2.52	0.41
1:A:2269:ASP:HA	1:A:2296:VAL:HA	2.02	0.41
1:C:171:PRO:HA	1:C:177:GLN:HE21	1.84	0.41
1:C:1007:SER:HA	1:C:1010:LEU:HB2	2.01	0.41
1:C:2167:ILE:HG13	1:C:2184:LEU:HD11	2.02	0.41
1:A:1393:TRP:CZ3	1:A:1408:PHE:HB3	2.55	0.41
1:A:2311:GLU:OE1	1:A:2311:GLU:N	2.53	0.41
1:C:707:TYR:HA	1:C:710:ASN:HD22	1.85	0.41
1:C:1564:LEU:HD23	1:C:1564:LEU:HA	1.96	0.41
1:C:1712:LEU:HD12	1:C:1712:LEU:HA	1.89	0.41
1:C:1548:ILE:HD13	1:C:1548:ILE:HA	1.89	0.41
1:C:2251:ASN:OD1	1:C:2251:ASN:N	2.52	0.41
1:C:2269:ASP:HA	1:C:2296:VAL:HA	2.02	0.41
1:A:1378:ILE:HG12	1:A:1505:ILE:HD11	2.00	0.41
1:A:1526:CYS:HB2	1:A:1564:LEU:HG	2.02	0.41
1:A:1912:THR:O	1:A:1943:ARG:NH2	2.43	0.41
1:C:578:GLU:O	1:C:582:LEU:N	2.52	0.41
1:C:2429:THR:HG21	1:C:2433:HIS:HB2	2.02	0.41
1:A:1626:ILE:O	1:A:1668:LEU:N	2.53	0.41
1:A:1707:ARG:HB3	1:A:1787:LEU:HD11	2.02	0.41
1:A:1994:ASP:N	1:A:1994:ASP:OD1	2.53	0.41
1:A:2181:PHE:O	1:A:2190:THR:OG1	2.32	0.41
1:C:252:ILE:H	1:C:252:ILE:HG13	1.69	0.41
1:A:63:PRO:HA	1:A:66:ILE:HG12	2.03	0.41
1:A:2415:LYS:HB3	1:A:2415:LYS:HE2	1.90	0.41
1:C:772:ARG:HH21	1:C:808:PHE:HE1	1.67	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1491:THR:OG1	1:C:1492:GLU:OE1	2.38	0.41
1:C:2177:GLY:N	1:C:2195:ALA:O	2.54	0.41
1:C:2511:ILE:HD13	1:C:2511:ILE:HA	1.89	0.41
1:A:1015:LYS:HE3	1:A:1015:LYS:HB2	1.87	0.41
1:A:1342:ASN:HB3	1:A:1434:TRP:HE1	1.86	0.41
1:C:274:LEU:HA	1:C:274:LEU:HD23	1.85	0.41
1:A:568:SER:HB3	1:A:609:LEU:HG	2.03	0.41
1:A:1010:LEU:HD23	1:A:1010:LEU:HA	1.89	0.41
1:A:1709:ILE:HG12	1:A:1738:ILE:HD11	2.02	0.41
1:A:1894:TYR:HB2	1:A:1905:VAL:HG23	2.02	0.41
1:A:1968:ARG:HH22	1:A:2101:CYS:HB2	1.86	0.41
1:A:2156:VAL:HG12	1:A:2168:TRP:HB2	2.02	0.41
1:A:2177:GLY:N	1:A:2195:ALA:O	2.54	0.41
2:B:152:LEU:HD12	2:B:152:LEU:HA	1.90	0.41
1:C:361:ARG:HA	1:C:367:GLN:HE22	1.86	0.41
1:C:815:PRO:HG3	1:C:1000:LEU:HD23	2.02	0.41
1:C:1342:ASN:HB3	1:C:1434:TRP:HE1	1.86	0.41
1:C:1526:CYS:HB2	1:C:1564:LEU:HG	2.02	0.41
1:C:1583:LEU:HD12	1:C:1600:PRO:HB3	2.03	0.41
1:C:1709:ILE:HG12	1:C:1738:ILE:HD11	2.02	0.41
1:C:2156:VAL:HG12	1:C:2168:TRP:HB2	2.02	0.41
1:C:2424:ALA:HB2	1:C:2501:PRO:HG3	2.02	0.41
1:A:251:ASN:N	1:A:251:ASN:OD1	2.54	0.41
1:A:422:LEU:HA	1:A:422:LEU:HD23	1.88	0.41
1:A:815:PRO:HG3	1:A:1000:LEU:HD23	2.02	0.41
1:A:2424:ALA:HB2	1:A:2501:PRO:HG3	2.02	0.41
1:C:63:PRO:HA	1:C:66:ILE:HG12	2.03	0.41
1:C:1626:ILE:O	1:C:1668:LEU:N	2.53	0.41
1:C:2181:PHE:O	1:C:2190:THR:OG1	2.32	0.41
2:D:169:GLN:HA	2:D:172:LYS:HB2	2.02	0.41
1:A:744:LEU:HD12	1:A:744:LEU:HA	1.89	0.40
1:A:2222:GLY:HA2	1:A:2245:VAL:HG23	2.03	0.40
1:C:2311:GLU:OE1	1:C:2311:GLU:N	2.54	0.40
1:A:92:CYS:SG	1:A:95:THR:N	2.94	0.40
1:A:437:LEU:HD12	1:A:437:LEU:HA	1.88	0.40
1:A:699:PHE:HD2	1:A:843:VAL:HG21	1.87	0.40
1:A:361:ARG:HA	1:A:367:GLN:HE22	1.86	0.40
1:A:1189:PRO:O	1:A:1192:ILE:HG22	2.21	0.40
1:A:2167:ILE:HG13	1:A:2184:LEU:HD11	2.02	0.40
1:C:56:GLN:HA	1:C:61:HIS:H	1.86	0.40
1:C:92:CYS:SG	1:C:95:THR:N	2.94	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:251:ASN:N	1:C:251:ASN:OD1	2.54	0.40
1:C:135:GLY:O	1:C:138:THR:OG1	2.35	0.40
1:C:1707:ARG:HB3	1:C:1787:LEU:HD11	2.02	0.40
1:C:2151:ILE:N	1:C:2173:HIS:HB3	2.36	0.40
2:D:61:ARG:HA	2:D:61:ARG:HD2	1.92	0.40
1:A:985:THR:O	1:A:985:THR:OG1	2.28	0.40
2:B:61:ARG:HA	2:B:61:ARG:HD2	1.92	0.40
1:C:568:SER:HB3	1:C:609:LEU:HG	2.03	0.40
1:C:1189:PRO:O	1:C:1192:ILE:HG22	2.21	0.40
2:D:121:VAL:HG13	2:D:153:VAL:HG13	2.04	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	2177/2527 (86%)	1966 (90%)	211 (10%)	0	100	100
1	C	2177/2527 (86%)	1968 (90%)	209 (10%)	0	100	100
2	B	169/176 (96%)	154 (91%)	15 (9%)	0	100	100
2	D	169/176 (96%)	154 (91%)	15 (9%)	0	100	100
All	All	4692/5406 (87%)	4242 (90%)	450 (10%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1423/2281 (62%)	1418 (100%)	5 (0%)	89	91
1	C	1428/2281 (63%)	1422 (100%)	6 (0%)	89	91
2	B	104/156 (67%)	104 (100%)	0	100	100
2	D	104/156 (67%)	104 (100%)	0	100	100
All	All	3059/4874 (63%)	3048 (100%)	11 (0%)	88	91

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	190	ARG
1	A	793	ARG
1	A	1266	CYS
1	A	1847	ARG
1	A	2413	ARG
1	C	181	CYS
1	C	190	ARG
1	C	793	ARG
1	C	1266	CYS
1	C	1847	ARG
1	C	2413	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (35) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	408	HIS
1	A	551	ASN
1	A	710	ASN
1	A	737	GLN
1	A	1021	ASN
1	A	1094	GLN
1	A	1194	ASN
1	A	1216	HIS
1	A	1278	ASN
1	A	1305	ASN
1	A	1758	HIS
1	A	1871	ASN
1	A	1872	ASN
1	A	2220	GLN

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Mol	Chain	Res	Type
1	A	2353	ASN
1	A	2369	ASN
2	B	192	ASN
1	C	173	ASN
1	C	408	HIS
1	C	551	ASN
1	C	710	ASN
1	C	737	GLN
1	C	1021	ASN
1	C	1094	GLN
1	C	1194	ASN
1	C	1216	HIS
1	C	1278	ASN
1	C	1305	ASN
1	C	1758	HIS
1	C	1871	ASN
1	C	1872	ASN
1	C	2220	GLN
1	C	2353	ASN
1	C	2369	ASN
2	D	192	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](#)

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	ANP	C	2602	-	29,33,33	1.15	4 (13%)	31,52,52	0.81	1 (3%)
3	GDP	A	2601	-	25,30,30	0.98	1 (4%)	30,47,47	1.17	3 (10%)
6	GNP	B	302	5	29,34,34	1.50	7 (24%)	33,54,54	2.20	6 (18%)
3	GDP	C	2601	-	25,30,30	0.99	1 (4%)	30,47,47	1.17	3 (10%)
6	GNP	D	302	5	29,34,34	1.50	7 (24%)	33,54,54	2.19	5 (15%)
4	ANP	A	2602	-	29,33,33	1.16	4 (13%)	31,52,52	0.81	1 (3%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	ANP	C	2602	-	-	8/14/38/38	0/3/3/3
3	GDP	A	2601	-	-	4/12/32/32	0/3/3/3
6	GNP	B	302	5	-	7/14/38/38	0/3/3/3
3	GDP	C	2601	-	-	4/12/32/32	0/3/3/3
6	GNP	D	302	5	-	7/14/38/38	0/3/3/3
4	ANP	A	2602	-	-	8/14/38/38	0/3/3/3

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	302	GNP	PB-O3A	3.49	1.63	1.59
6	B	302	GNP	PB-O3A	3.44	1.63	1.59
6	D	302	GNP	C6-N1	3.06	1.38	1.33
6	B	302	GNP	C6-N1	3.02	1.38	1.33
3	C	2601	GDP	C6-N1	-2.93	1.33	1.37
3	A	2601	GDP	C6-N1	-2.87	1.33	1.37
6	B	302	GNP	PB-O1B	2.69	1.50	1.46
6	D	302	GNP	PB-O1B	2.67	1.50	1.46
4	A	2602	ANP	PB-O3A	-2.63	1.55	1.59
6	D	302	GNP	PG-N3B	2.59	1.70	1.63
6	B	302	GNP	PG-N3B	2.59	1.70	1.63
4	C	2602	ANP	PB-O3A	-2.57	1.55	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	2602	ANP	PG-O1G	2.49	1.49	1.46
4	C	2602	ANP	PG-O1G	2.47	1.49	1.46
6	B	302	GNP	PG-O1G	2.46	1.49	1.46
6	D	302	GNP	PG-O1G	2.43	1.49	1.46
4	C	2602	ANP	PG-N3B	2.43	1.69	1.63
4	A	2602	ANP	PG-N3B	2.42	1.69	1.63
6	B	302	GNP	PB-O2B	-2.30	1.50	1.56
6	D	302	GNP	PB-O2B	-2.30	1.50	1.56
4	C	2602	ANP	PB-O1B	2.23	1.49	1.46
4	A	2602	ANP	PB-O1B	2.23	1.49	1.46
6	B	302	GNP	C5-C6	2.08	1.44	1.41
6	D	302	GNP	C5-C6	2.06	1.44	1.41

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	302	GNP	C5-C6-N1	-8.63	111.88	123.42
6	D	302	GNP	C5-C6-N1	-8.63	111.88	123.42
6	B	302	GNP	C2-N1-C6	6.64	125.19	115.96
6	D	302	GNP	C2-N1-C6	6.62	125.17	115.96
3	C	2601	GDP	C8-N7-C5	2.93	107.53	102.55
3	A	2601	GDP	C8-N7-C5	2.91	107.51	102.55
6	D	302	GNP	N3-C2-N1	-2.89	123.54	127.21
6	B	302	GNP	N3-C2-N1	-2.87	123.56	127.21
3	C	2601	GDP	O4'-C1'-N9	2.49	112.05	108.75
3	A	2601	GDP	O4'-C1'-N9	2.46	112.00	108.75
6	B	302	GNP	C2-N3-C4	-2.44	112.86	115.48
6	D	302	GNP	C2-N3-C4	-2.43	112.86	115.48
4	A	2602	ANP	C5-C6-N6	2.30	123.81	120.31
4	C	2602	ANP	C5-C6-N6	2.29	123.80	120.31
6	B	302	GNP	O3G-PG-O1G	-2.28	107.74	113.45
6	D	302	GNP	O3G-PG-O1G	-2.25	107.81	113.45
3	C	2601	GDP	C5-C6-N1	2.09	118.05	114.07
3	A	2601	GDP	C5-C6-N1	2.08	118.04	114.07
6	B	302	GNP	O1B-PB-N3B	-2.01	108.82	111.77

There are no chirality outliers.

All (38) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	2601	GDP	C5'-O5'-PA-O3A
3	A	2601	GDP	C5'-O5'-PA-O1A

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Mol	Chain	Res	Type	Atoms
3	A	2601	GDP	C5'-O5'-PA-O2A
3	C	2601	GDP	C5'-O5'-PA-O3A
3	C	2601	GDP	C5'-O5'-PA-O1A
3	C	2601	GDP	C5'-O5'-PA-O2A
4	A	2602	ANP	PB-N3B-PG-O1G
4	A	2602	ANP	PG-N3B-PB-O1B
4	A	2602	ANP	PG-N3B-PB-O3A
4	A	2602	ANP	C5'-O5'-PA-O1A
4	A	2602	ANP	C5'-O5'-PA-O2A
4	A	2602	ANP	C5'-O5'-PA-O3A
4	C	2602	ANP	PB-N3B-PG-O1G
4	C	2602	ANP	PG-N3B-PB-O1B
4	C	2602	ANP	PG-N3B-PB-O3A
4	C	2602	ANP	C5'-O5'-PA-O1A
4	C	2602	ANP	C5'-O5'-PA-O2A
4	C	2602	ANP	C5'-O5'-PA-O3A
6	B	302	GNP	PB-N3B-PG-O1G
6	B	302	GNP	PG-N3B-PB-O1B
6	D	302	GNP	PB-N3B-PG-O1G
6	D	302	GNP	PG-N3B-PB-O1B
6	B	302	GNP	O4'-C4'-C5'-O5'
6	B	302	GNP	C3'-C4'-C5'-O5'
6	D	302	GNP	O4'-C4'-C5'-O5'
6	D	302	GNP	C3'-C4'-C5'-O5'
3	A	2601	GDP	C3'-C4'-C5'-O5'
3	C	2601	GDP	C3'-C4'-C5'-O5'
6	B	302	GNP	C5'-O5'-PA-O3A
6	B	302	GNP	C5'-O5'-PA-O1A
6	B	302	GNP	C5'-O5'-PA-O2A
6	D	302	GNP	C5'-O5'-PA-O3A
6	D	302	GNP	C5'-O5'-PA-O1A
6	D	302	GNP	C5'-O5'-PA-O2A
4	A	2602	ANP	PB-O3A-PA-O1A
4	C	2602	ANP	PB-O3A-PA-O1A
4	A	2602	ANP	PB-O3A-PA-O2A
4	C	2602	ANP	PB-O3A-PA-O2A

There are no ring outliers.

4 monomers are involved in 8 short contacts:

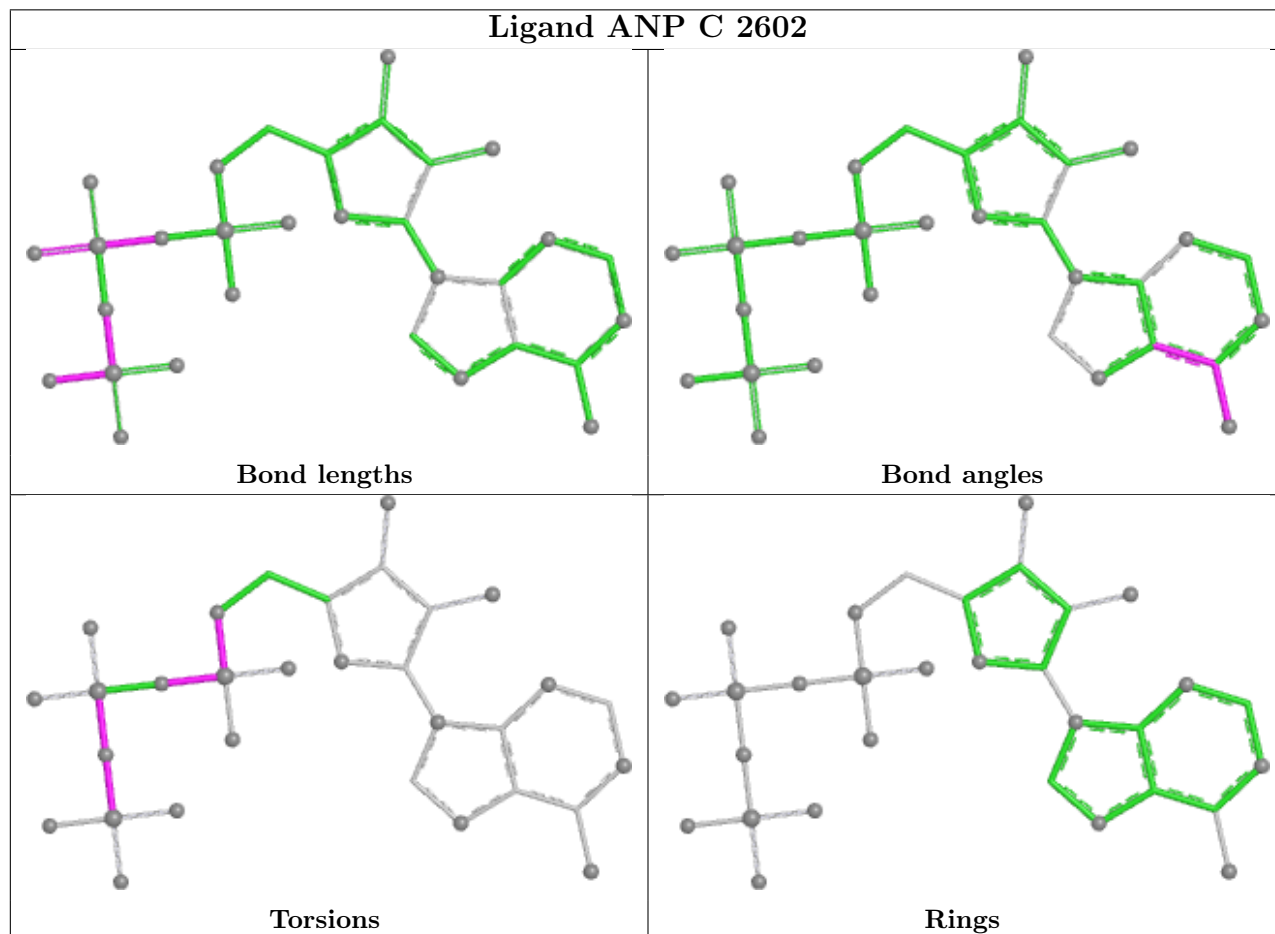
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	2602	ANP	2	0

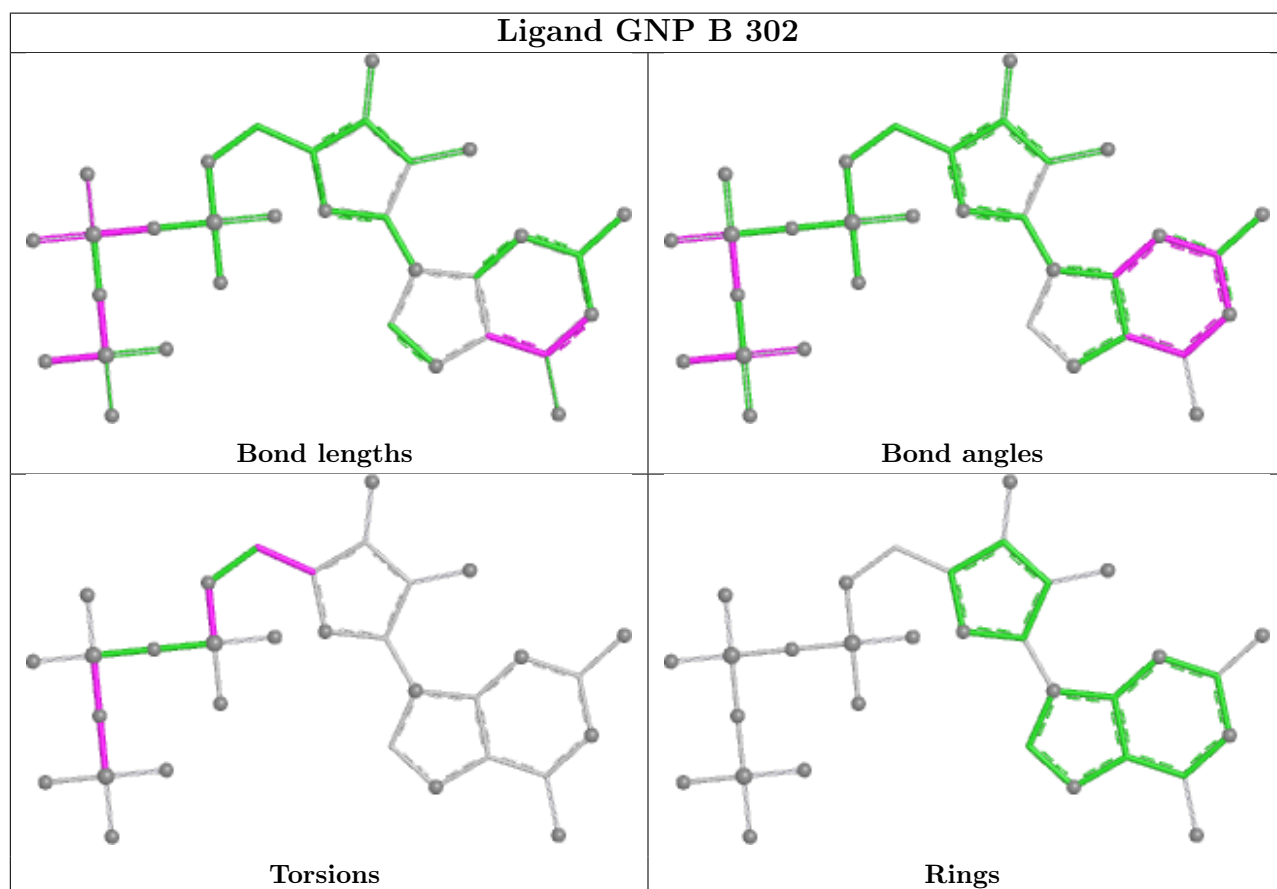
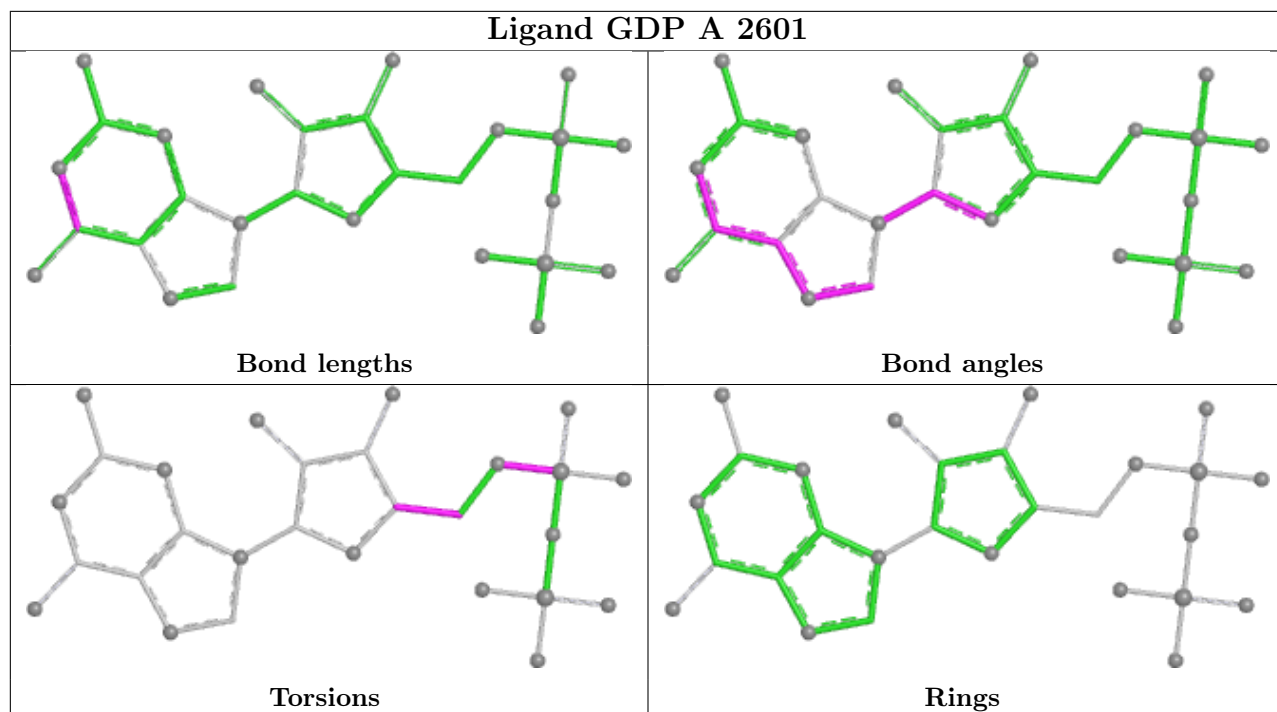
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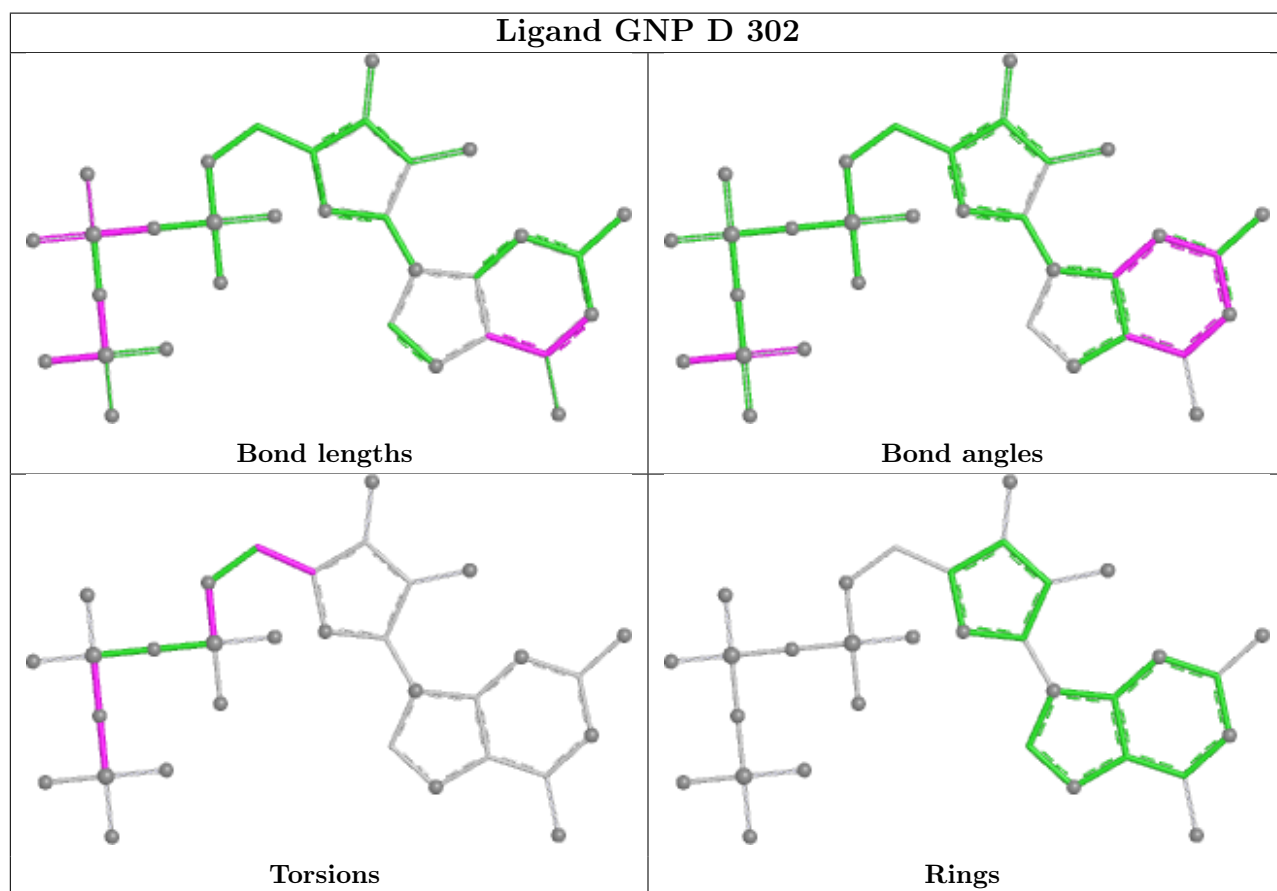
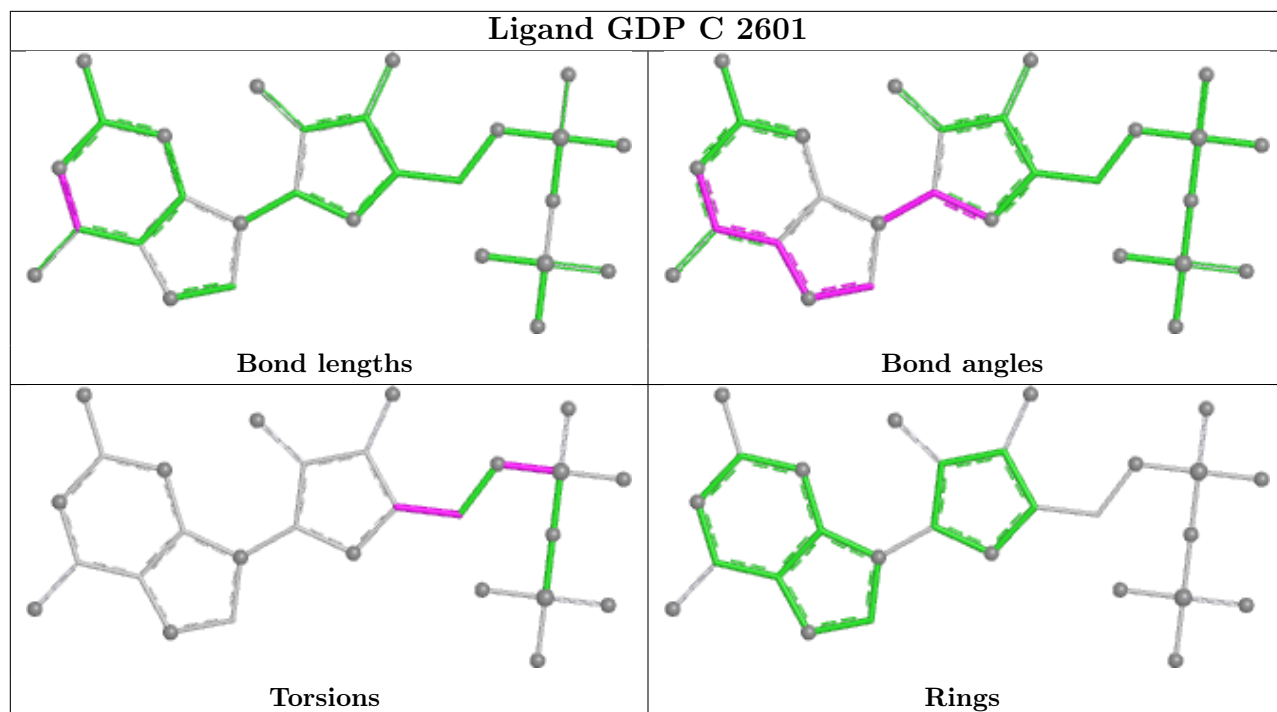
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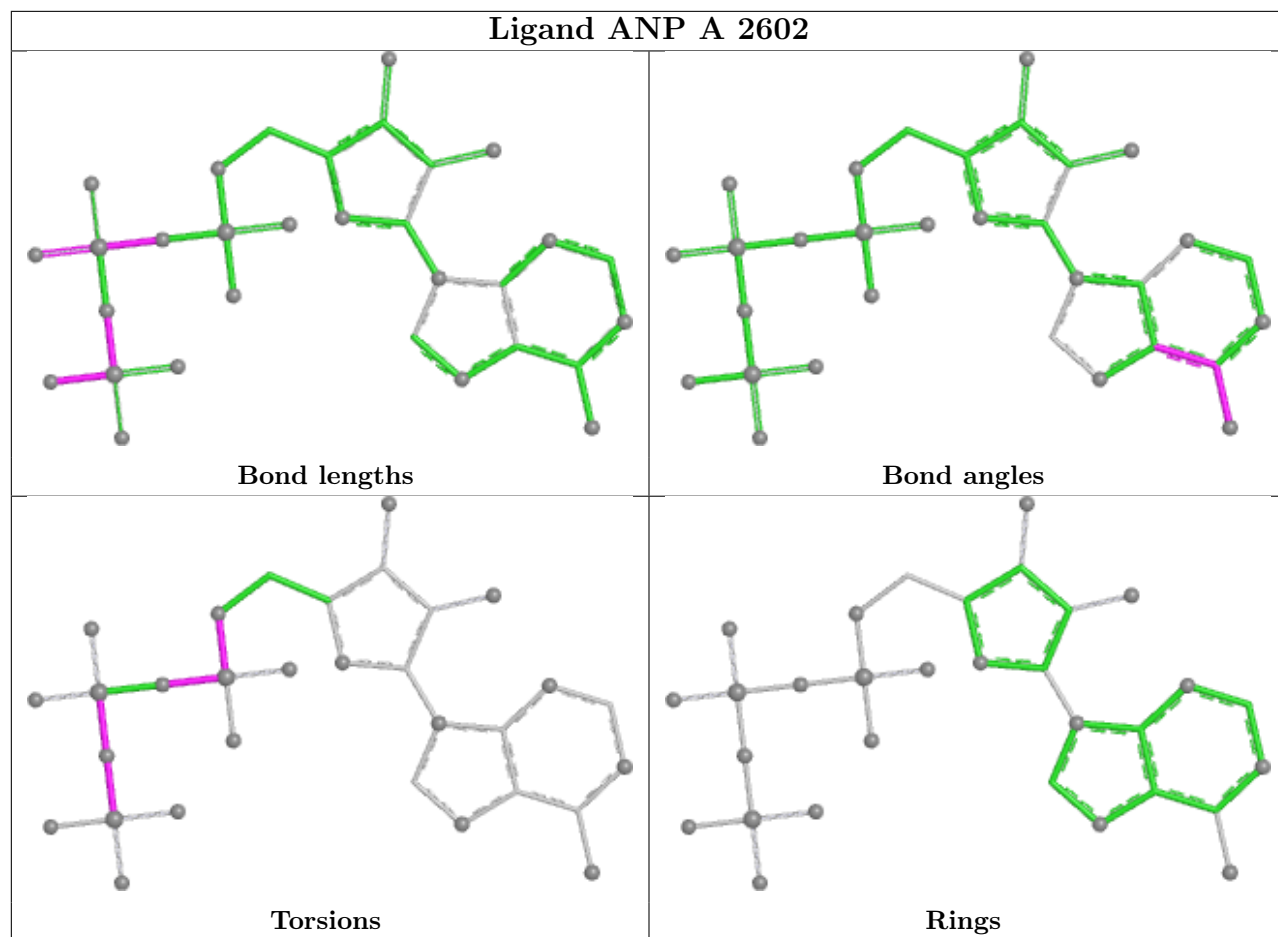
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	302	GNP	3	0
6	D	302	GNP	2	0
4	A	2602	ANP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.









5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

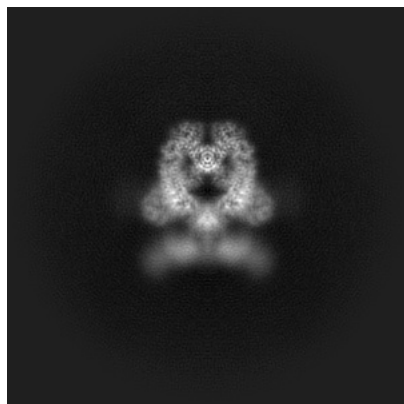
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43235. These allow visual inspection of the internal detail of the map and identification of artifacts.

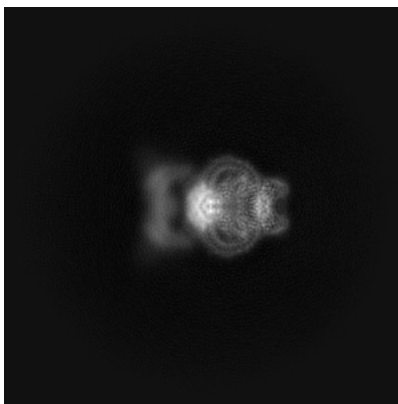
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

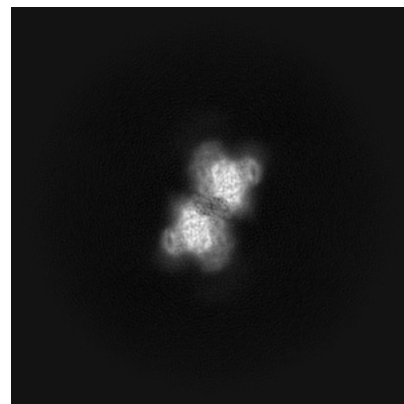
6.1.1 Primary map



X

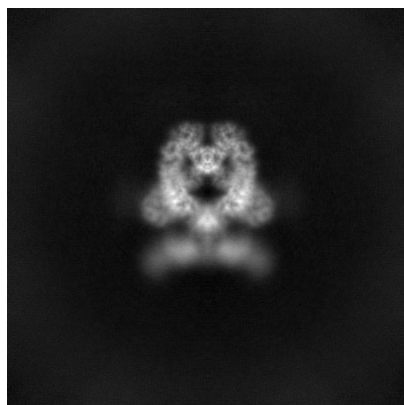


Y

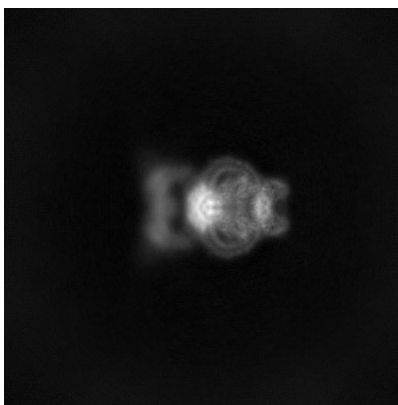


Z

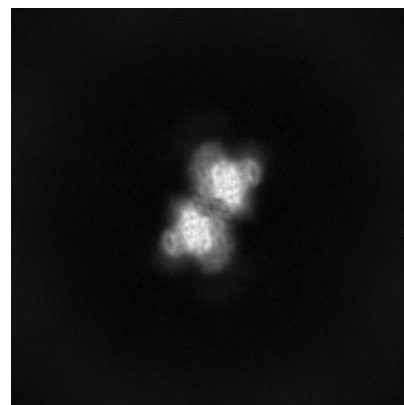
6.1.2 Raw map



X



Y

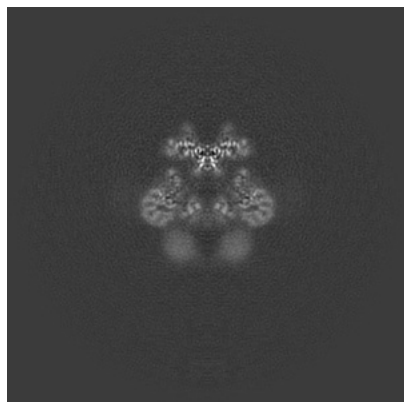


Z

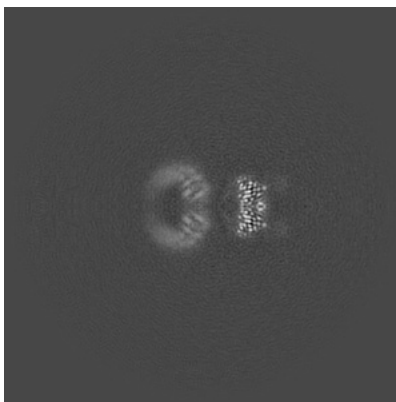
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

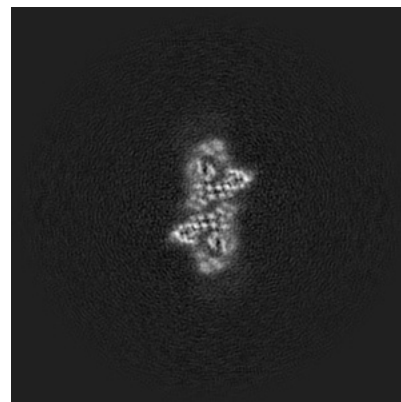
6.2.1 Primary map



X Index: 176

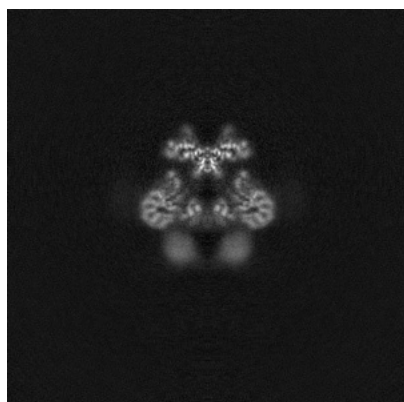


Y Index: 176

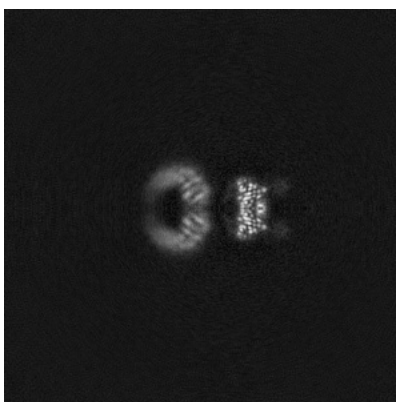


Z Index: 176

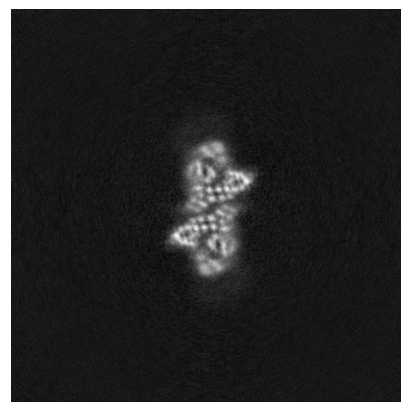
6.2.2 Raw map



X Index: 176



Y Index: 176

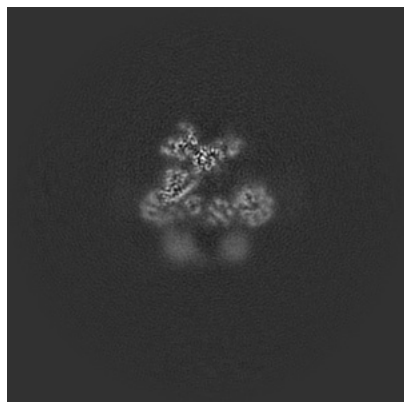


Z Index: 176

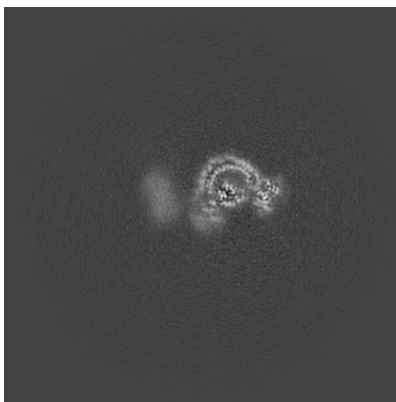
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

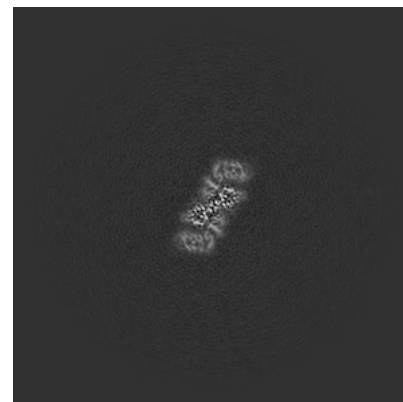
6.3.1 Primary map



X Index: 172

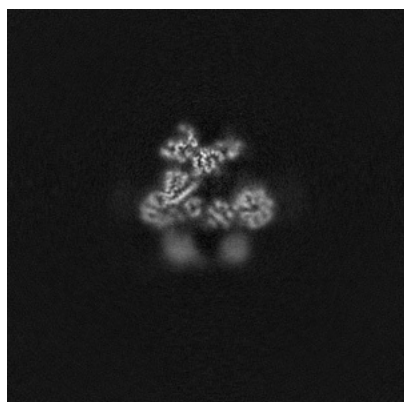


Y Index: 203

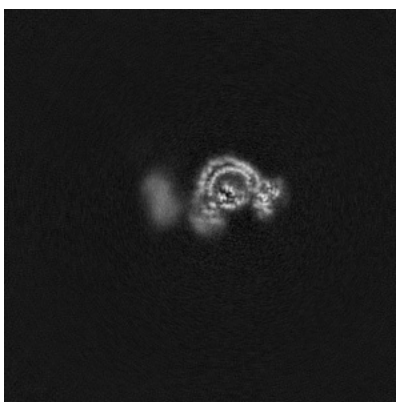


Z Index: 223

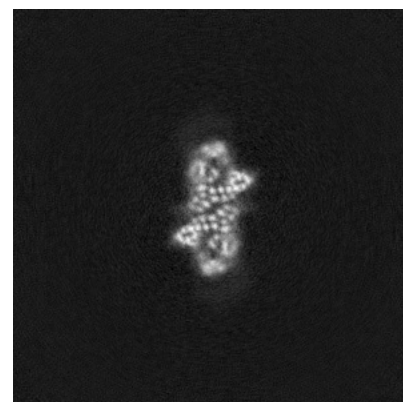
6.3.2 Raw map



X Index: 172



Y Index: 203

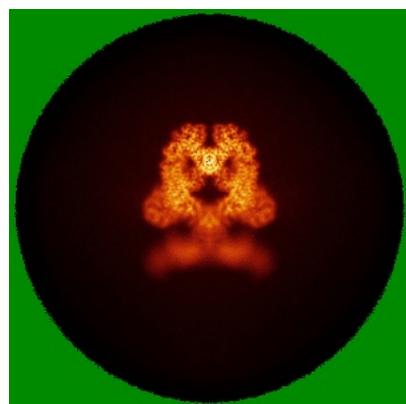


Z Index: 175

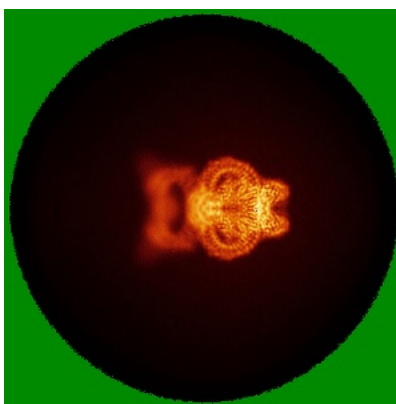
The images above show the largest variance slices of the map in three orthogonal directions.

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

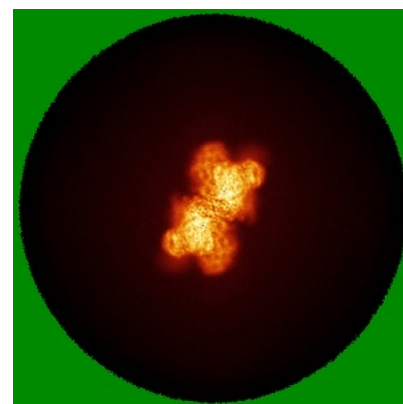
6.4.1 Primary map



X

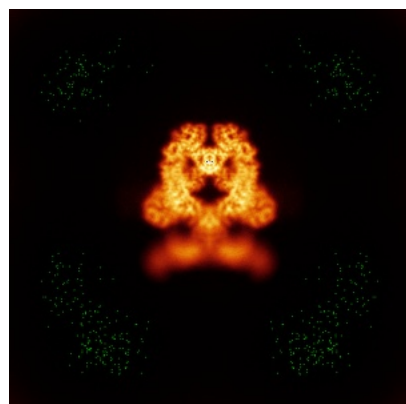


Y

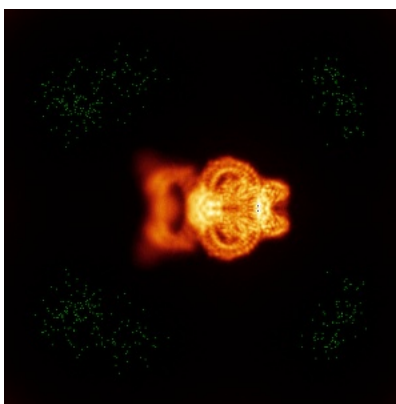


Z

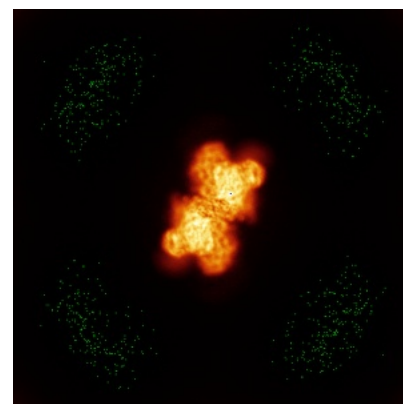
6.4.2 Raw map



X



Y



Z

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

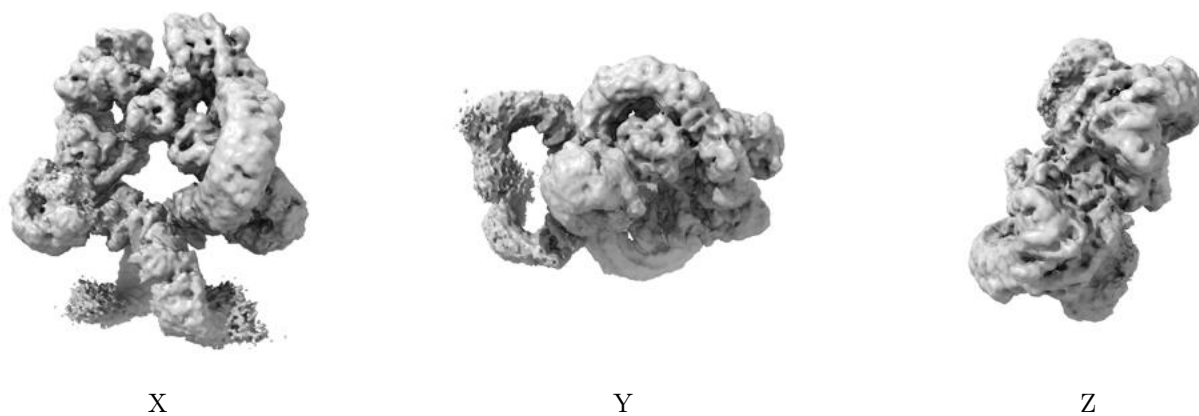
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

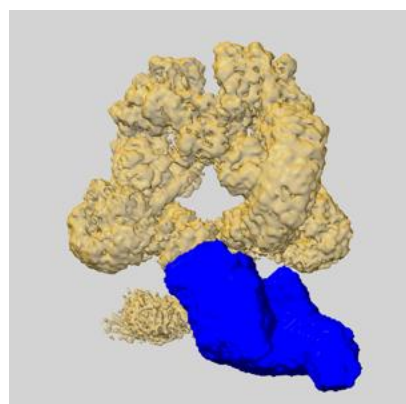
6.6 Mask visualisation [i](#)

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

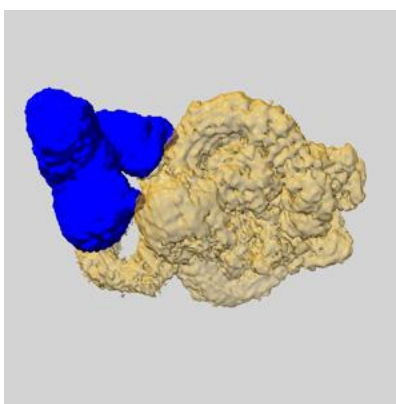
A mask typically either:

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

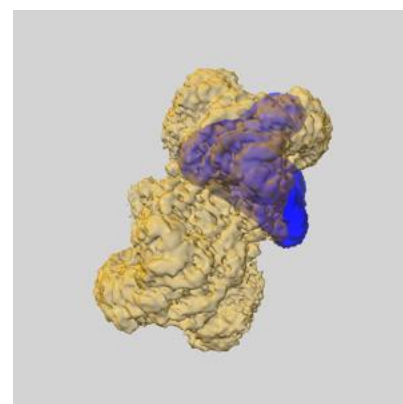
6.6.1 emd_43235_msk_1.map [i](#)



X

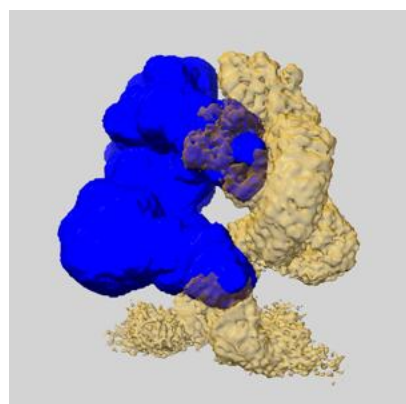


Y

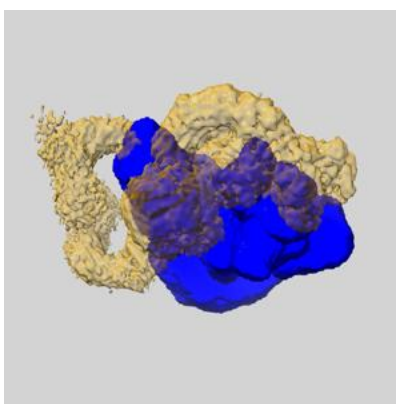


Z

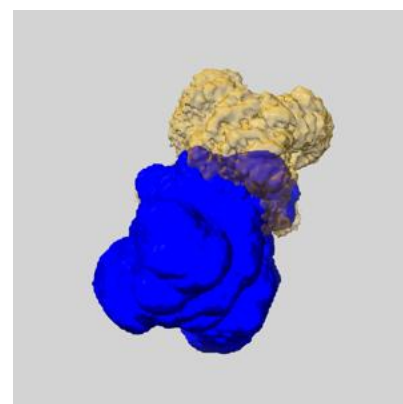
6.6.2 emd_43235_msk_2.map [i](#)



X



Y

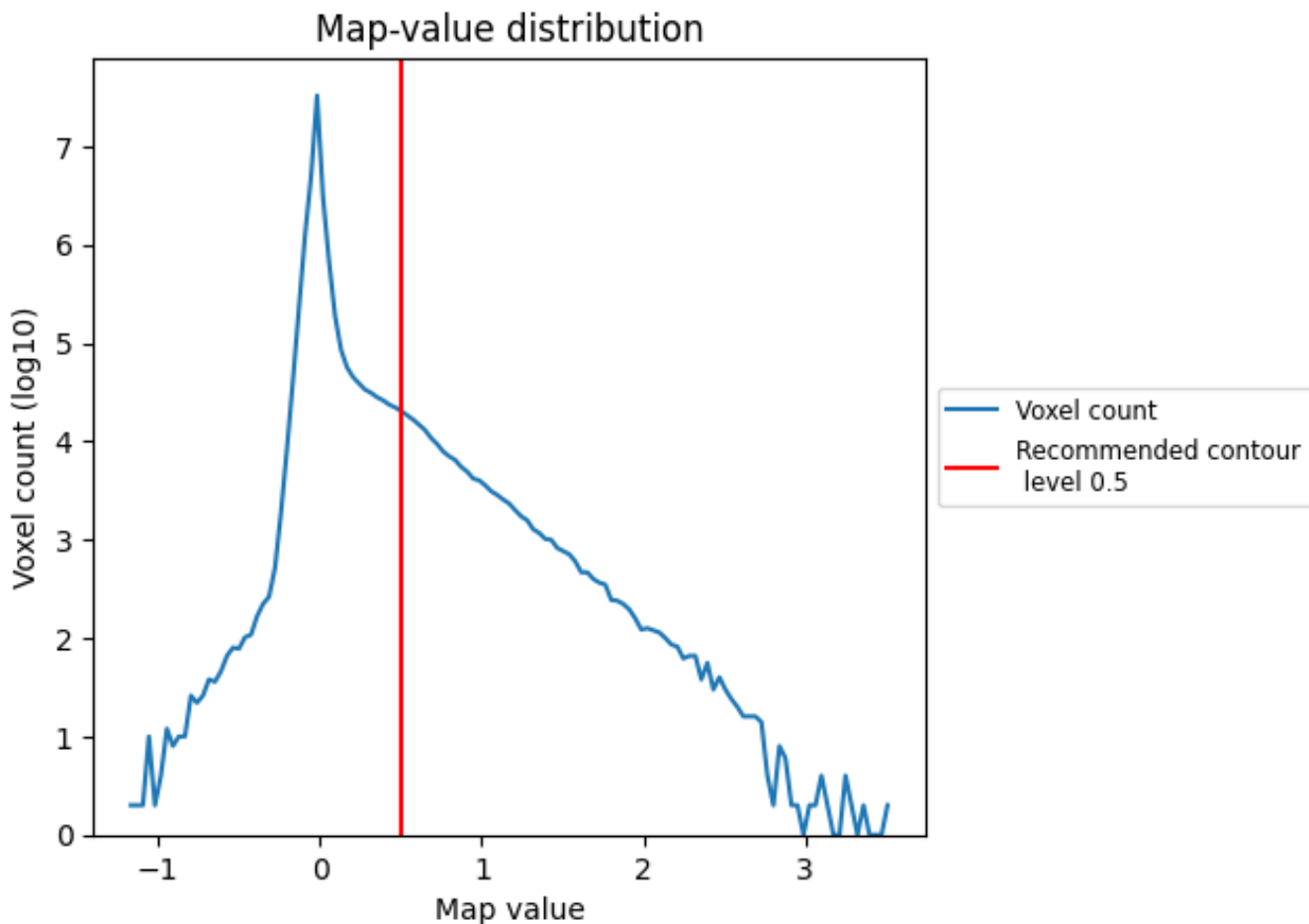


Z

7 Map analysis [i](#)

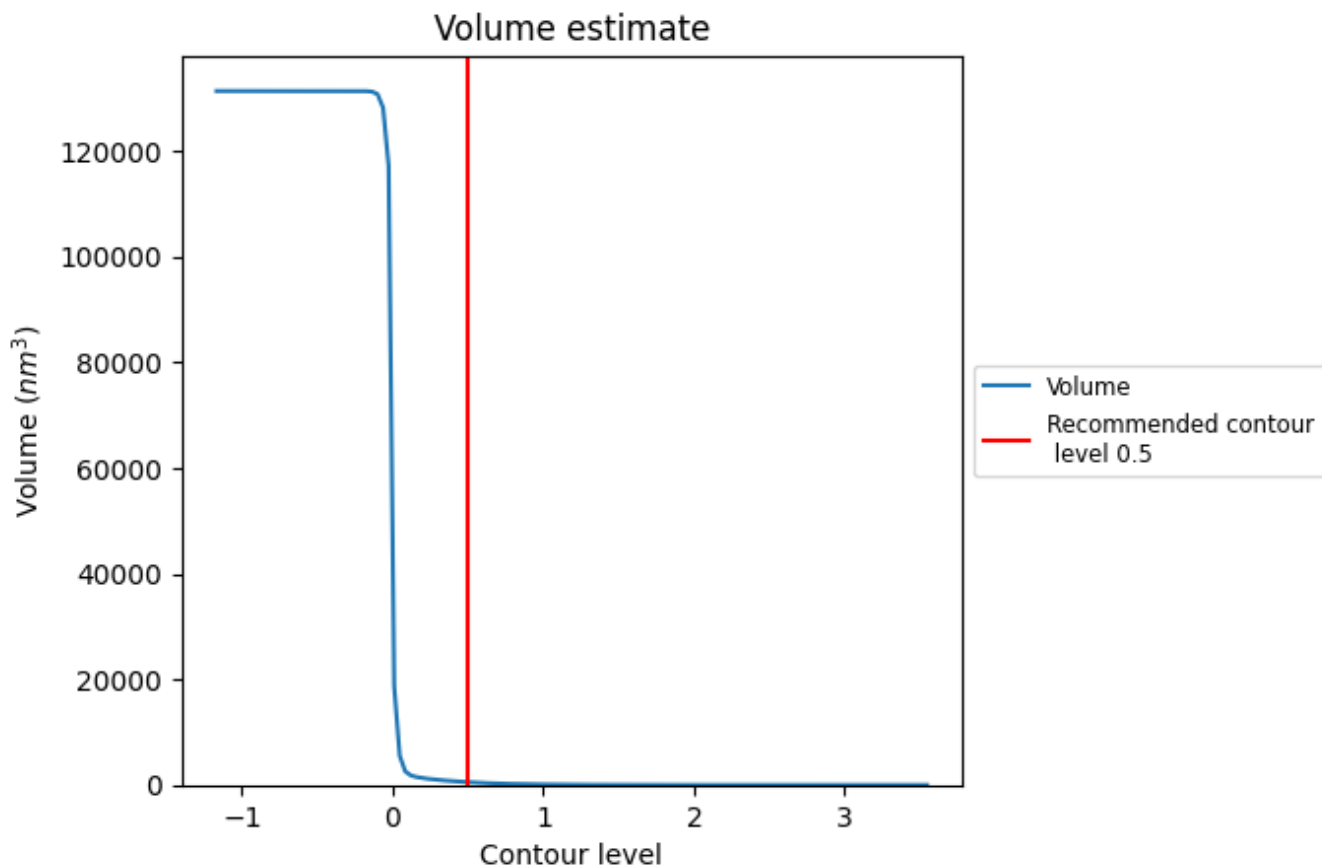
This section contains the results of statistical analysis of the map.

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.

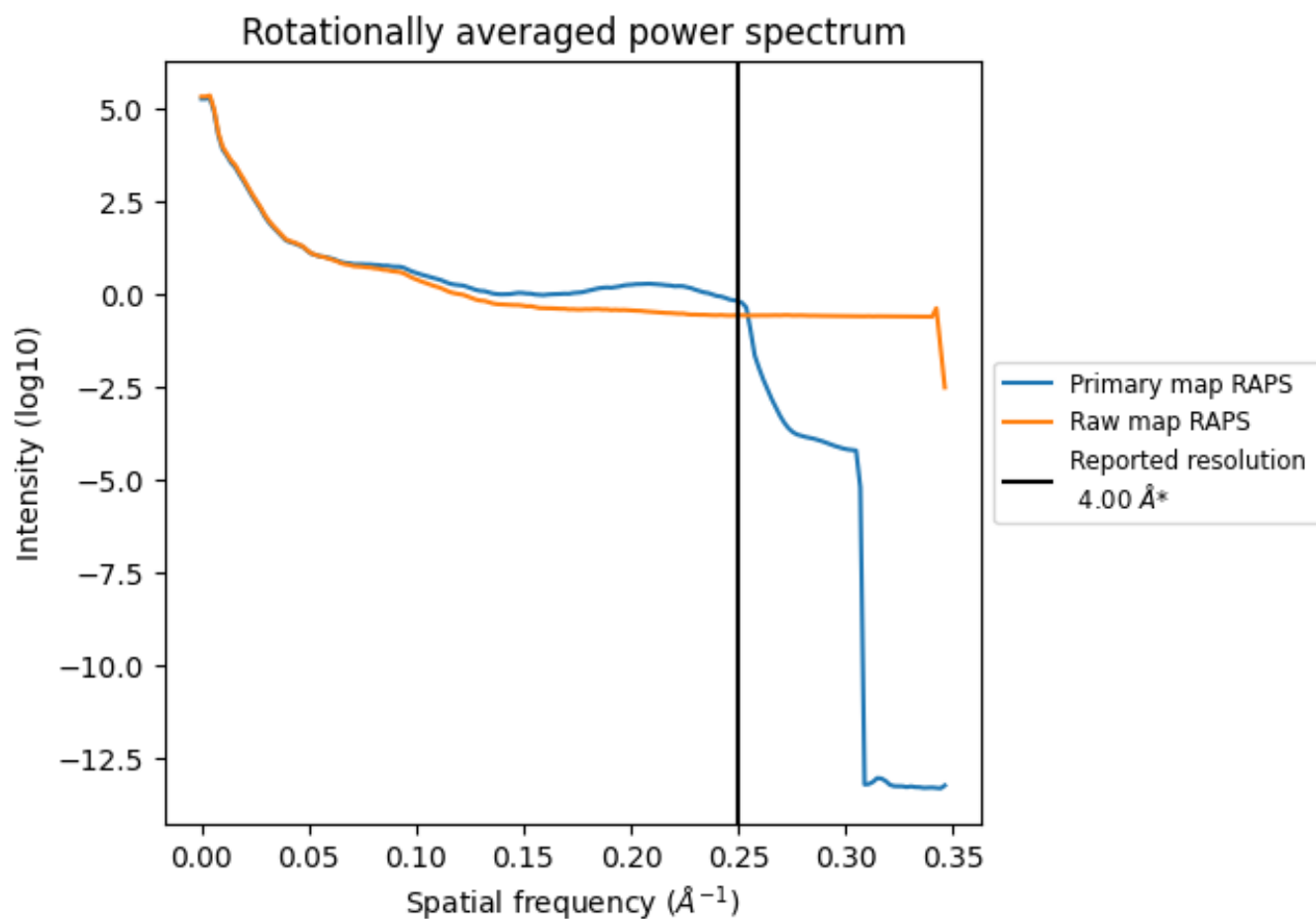
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 530 nm³; this corresponds to an approximate mass of 479 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](#)

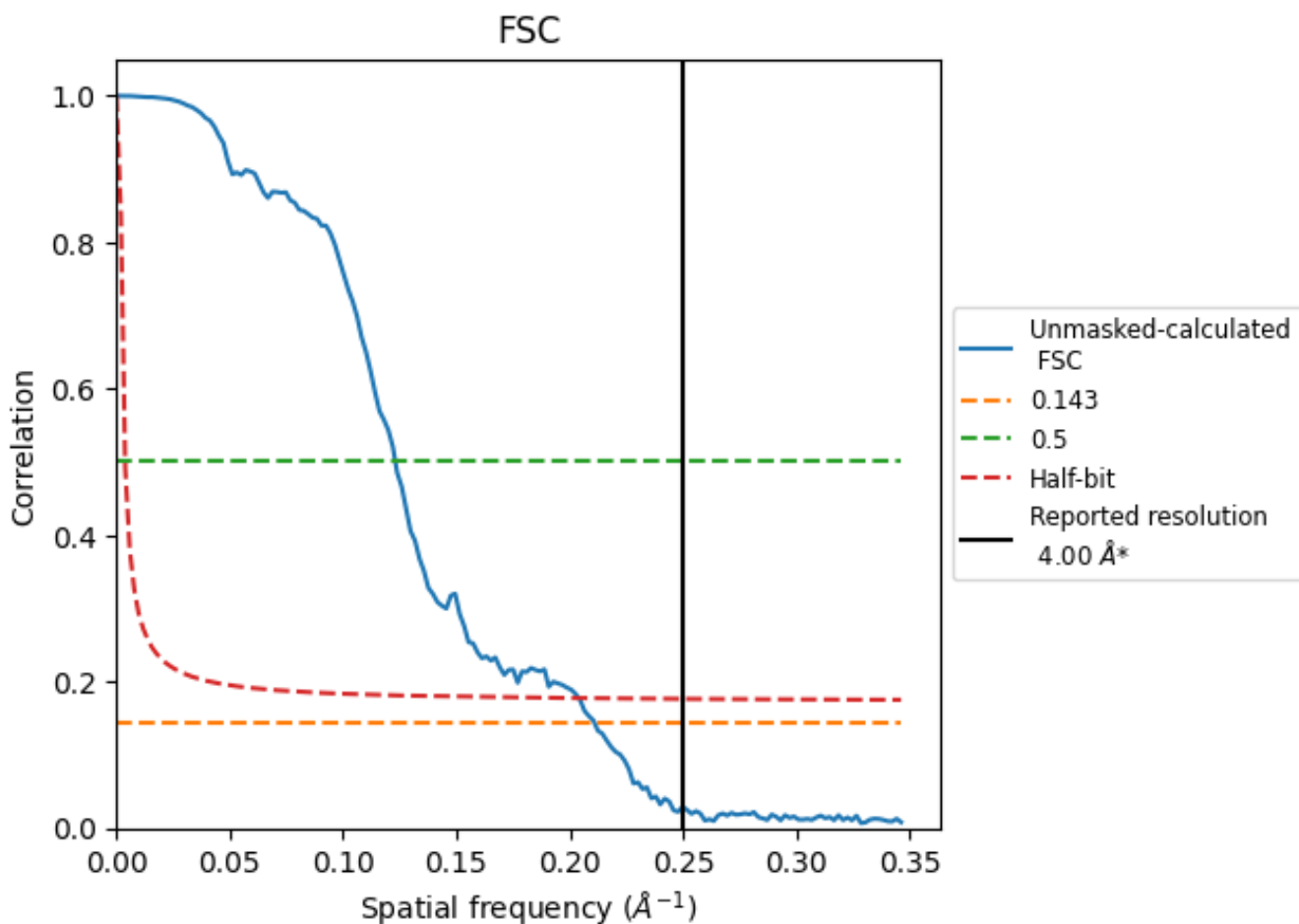


*Reported resolution corresponds to spatial frequency of 0.250 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.250 Å⁻¹

8.2 Resolution estimates [i](#)

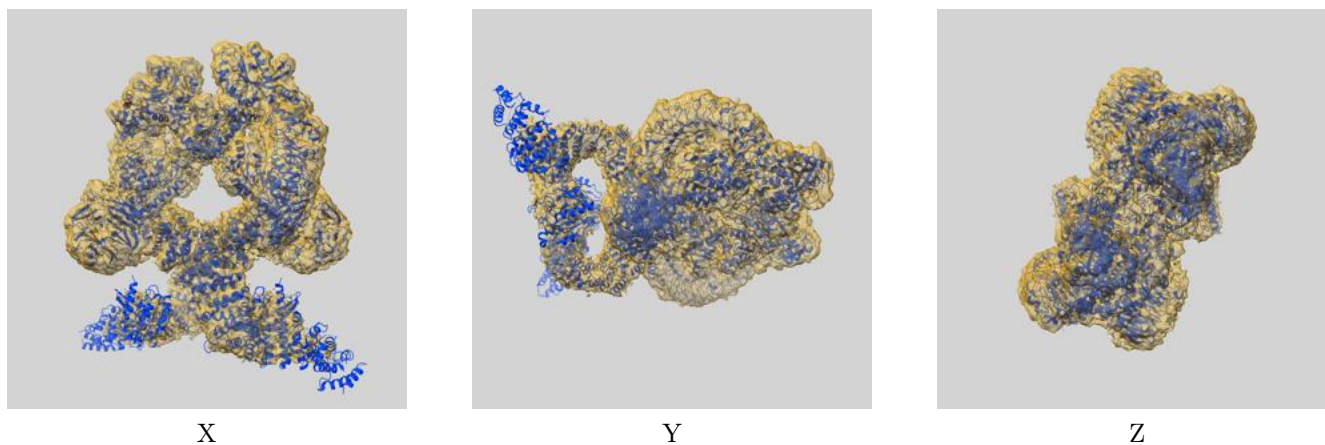
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.74	8.12	4.90

*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 4.74 differs from the reported value 4.0 by more than 10 %

9 Map-model fit [i](#)

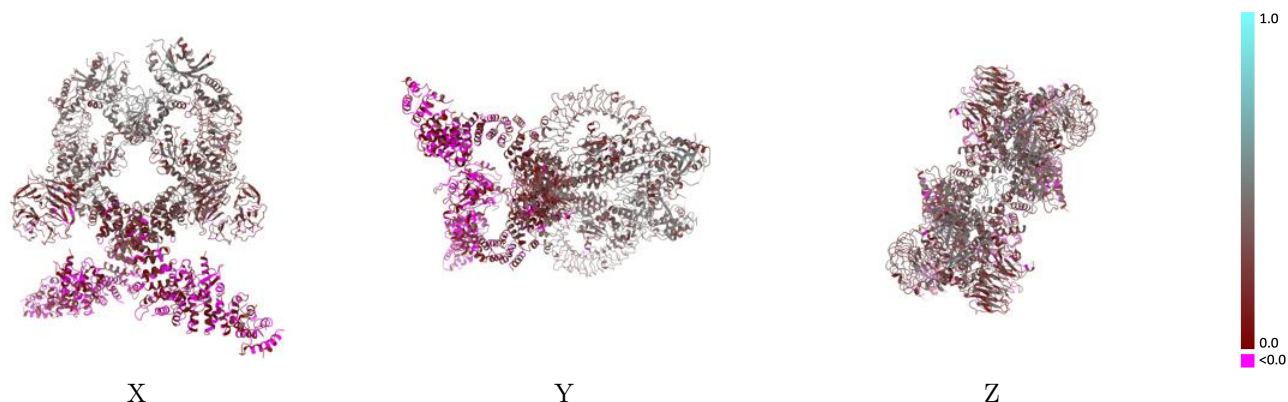
This section contains information regarding the fit between EMDB map EMD-43235 and PDB model 8VH5. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



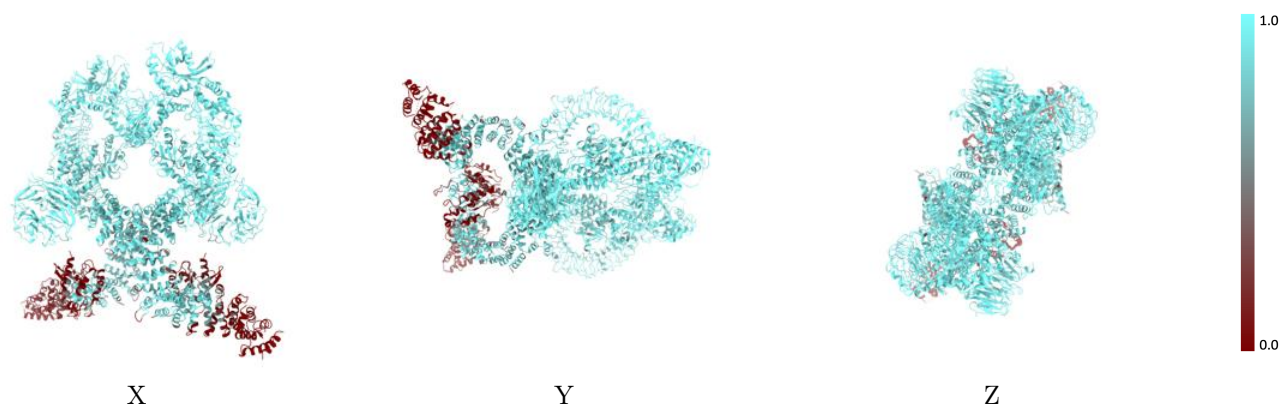
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



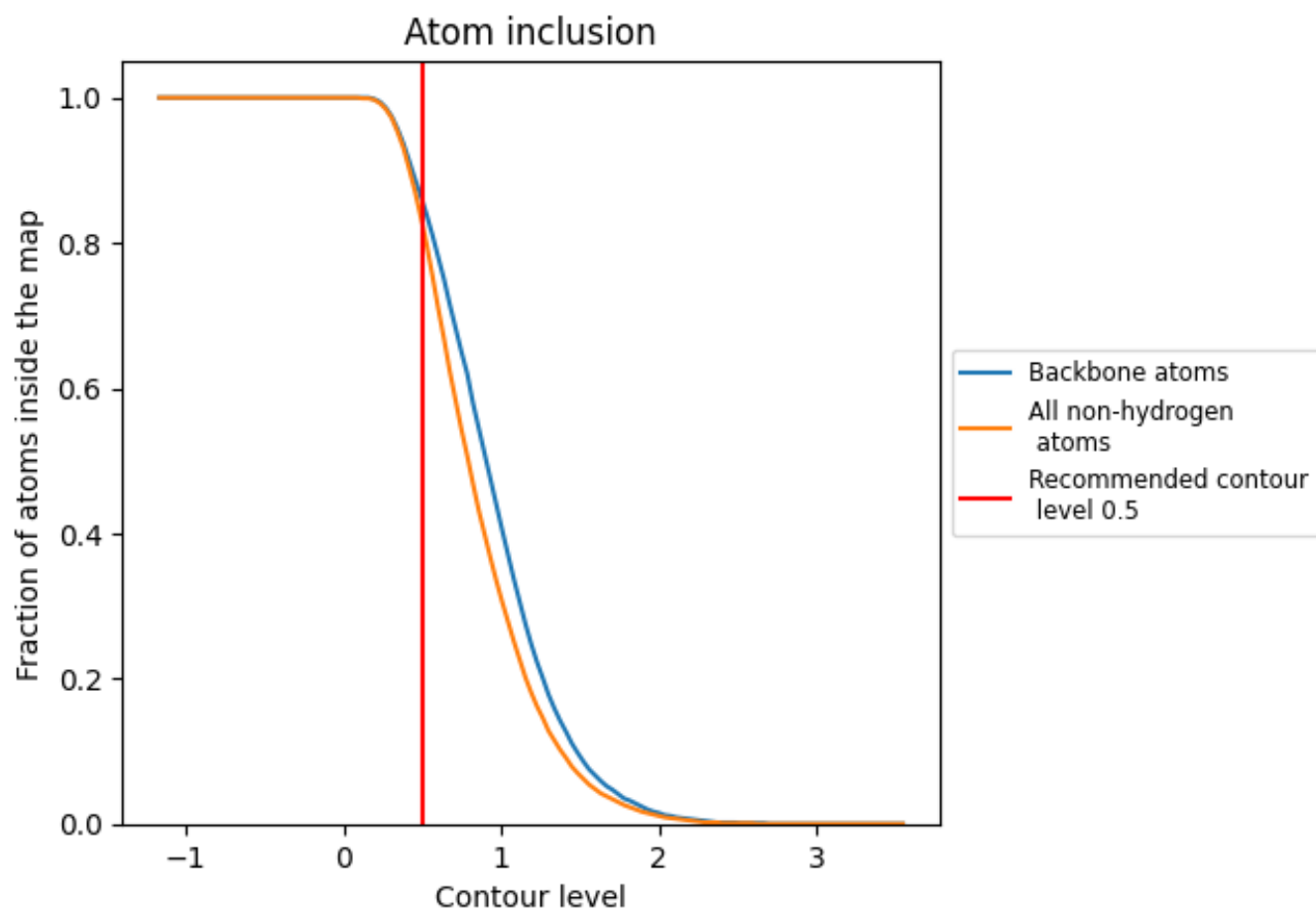
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.5).











9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 82% 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 (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8250	 0.2480
A	 0.8600	 0.2600
B	 0.3670	 0.0350
C	 0.8650	 0.2690
D	 0.3400	 0.0440

