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Global classification of isolated singularities in dimensions (4,3) and (8,5)

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Abstract. We characterize those closed 2k-manifolds admitting smooth maps into (k + 1)-manifolds with only finitely many critical points, for $k \in \{2, 4\}$. We compute then the minimal number of critical points of such smooth maps for k = 2 and, under some fundamental group restrictions, also for k = 4. The main ingredients are King's local classification of isolated singularities, decomposition theory, low dimensional cobordisms of spherical fibrations and 3-manifolds topology.

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