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Isostatic Almost Spherical Frameworks via Disc Decomposition

We investigate a class of graphs formed from triangulated spheres by removing some edges of the triangulated sphere to form holes, and inserting edges elsewhere between vertices of the triangulated sphere to form polyhedral blocks. The holes and blocks are created in such a way as to balance the count; that is, the number of edges removed from the holes equals the number of edges added to form blocks. We confirm the rigidity and independence of almost all realizations of the graphs in this class in 3-space.