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Triangulating the Torus with Two Odd Vertices: Structure and Coloring

We verify a conjecture of Grunbaum for a family of graphs on the torus: every bridgeless toroidal cubic graph with at most two odd faces is 3-edge colorable. As a key step we classify the set of triangulations of the torus having minimum degree five and exactly two odd-degree vertices. Our techniques involve some invariants and special walks, also some topology.