

# Separating cycles in doubly toroidal embeddings

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## Abstract

We show that every 4-representative graph embedding in the double torus contains a noncontractible cycle which separates the surface into two pieces. This improves a result of Zha and Zhao for general orientable surfaces, in which the same conclusion holds for 6-representative graph embeddings. Noncontractible separating cycles have been studied because they provide a way to do induction on the genus of a graph embedding.