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Mark Ellingham* (mark.ellingham@vanderbilt.edu) and **Joanna A. Ellis-Monaghan.**

Orientable embeddings with two euler circuit faces.

In a *directed embedding* of a digraph each face is bounded by a directed walk; if the digraph is connected it must be eulerian. An orientable directed embedding has at least two faces, and it has exactly two faces if and only if it is an *orientable two-euler-face*, or *OTEF*, directed embedding, with each face bounded by a directed euler circuit. Such an embedding is a directed embedding of maximum genus. There is an obvious necessary condition that a digraph with an OTEF directed embedding must satisfy. In 2002 Bonnington, Conder, Morton and McKenna showed that every regular tournament satisfying this condition has an OTEF directed embedding. We consider generalizations of their result. We show that the necessary condition is not in general sufficient. In fact, we show the stronger result that there are 4-edge-connected eulerian undirected graphs with no OTEF embedding (defined analogously for undirected graphs). But we also show that a very large class of eulerian digraphs do have OTEF directed embeddings, namely those in which every vertex has degree congruent to 2 modulo 4. (Received August 11, 2020)