

EMBEDDINGS OF CRITICAL GRAPHS NEAR THE HEAWOOD BOUND

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Complementing a theorem of Škrekovski, we characterize the $(h - 1)$ -critical graphs embeddable in surfaces of Euler genus at least 5, where h denotes the Heawood number of the surface. Outside of a few small cases, the bulk of our proof is determining the genus of the join of a complete graph and the 5-cycle. As a byproduct of our proof, we also provide a simpler solution to the minimum triangulations problem for nonorientable surfaces using the theory of current graphs.