

Upper bounds for the bondage number of graphs on topological surfaces

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The bondage number $b(G)$ of a graph G is the smallest number of edges of G whose removal results in a graph having the domination number larger than that of G . In a sense, the bondage number $b(G)$ measures integrity and reliability of the domination number $\gamma(G)$ with respect to the edge removal, which corresponds, e.g., to link failures in communication networks. We show that, for a graph G having the maximum vertex degree $\Delta(G)$ and embeddable on an orientable surface of genus h and a non-orientable surface of genus k ,

$$b(G) \leq \min\{\Delta(G) + h + 2, \Delta(G) + k + 1\}.$$

This generalizes known upper bounds for planar and toroidal graphs. (Joint work with Vadim Zverovich, University of the West of England, Bristol, U.K.)