

Applications of ordinary voltage graph theory and intersection theory to graph embeddability

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Abstract

This will be a short talk. We will discuss the extendability of free actions of groups on graphs to embeddings of graphs in surfaces. We will make use of ordinary voltage graph embeddings, which encode the (derived) embeddings we seek in the form of other (base) embeddings. We will develop and apply our homologically driven matrix analysis of ordinary voltage graph embeddings and the derived embeddings that they encode. We will see how we can use this matrix analysis to show that for each prime $p > 5$, the Generalized Petersen Graph $GP(2p, 2)$ can be cellularly embedded in the torus, but not as a derived embedding.

Keywords: graph, voltage graph, group action, embeddability.