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Proper Rainbow Saturation for Trees

Given a graph H, say that a graph G is properly rainbow H-saturated if there exists a rainbow H-free proper edge-colouring of G, and, for any non-edge e of G, every proper edge-colouring of $G + e$ contains a rainbow copy of H. The proper rainbow saturation number is the minimum number of edges in a properly rainbow H-saturated graph on n vertices. This is a natural variant of the graph saturation problem based on the rainbow extremal number. In this talk, we will discuss results on the proper rainbow saturation number, including exact values and asymptotically tight bounds for several classes of graphs, with a particular focus on trees.

Joint work with Natasha Morrison.