Approximation algorithms for the minimum rainbow subgraph problem

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We consider the Minimum Rainbow Subgraph problem (MRS): Given a graph $G$, whose edges are coloured with $p$ colours. Find a subgraph $F \subseteq G$ of $G$ of minimum order and with $p$ edges such that each colour occurs exactly once.

In this talk we will present upper and lower bounds for the order of the minimum rainbow subgraph $F$.

For graphs with maximum degree $\Delta(G)$ there is a greedy polynomial-time approximation algorithm for the MRS problem with an approximation ratio of $\Delta(G)$. We will present a polynomial-time approximation algorithm with an approximation ratio of $\frac{5}{6}\Delta$.

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