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On the minimum rainbow subgraph number of a graph

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Abstract

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 minimum order and with p edges such that each colour occurs exactly once. This problem is NP-hard and APX-hard. For a given graph G and an edge colouring c with p colours we define the *rainbow subgraph number* $rs(G, c)$ to be the order of a minimum rainbow subgraph of G with size p . In this paper we will show lower and upper bounds for the rainbow subgraph number of a graph.

Keywords: Edge colouring, rainbow subgraph.

Math Sci Net: [05C15 \(05C85\)](#)

O minimalnem mavričnem podgrafovskem številu grafa

Povzetek

Preučimo problem minimalnega mavričnega podgrafa (MMP): za dani graf G , čigar povezave so pobarvane s p barvami, poišči podgraf $F \subseteq G$ minimalnega reda in s p povezavami, v katerem da se vsaka barva pojavi natanko enkrat. Ta problem je NP-težak in APX-težak. Za dani graf G in funkcijo barvanja povezav c s p barvami definiramo *mavrično podgrafovsko število* $rs(G, c)$ kot red minimalnega mavričnega podgrafa grafa G velikosti p . V članku podamo spodnje in zgornje meje za mavrično podgrafovsko število danega grafa.

Ključne besede: Barvanje povezav, mavrični podgraf.