

# Edge-Coloring of Multigraphs: Goldberg's Conjecture

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## Abstract

In 1964, Vizing published his well known theorem stating that the chromatic index of a multigraph  $\chi_E(G)$  is bounded above by  $\Delta(G) + \mu(G)$ , where  $\Delta(G)$  is the maximum degree of a vertex in the graph and  $\mu(G)$  is the maximum size of a parallel class of edges. In 1984 M.K. Goldberg republished in English some results he had published earlier in Russian, among them a refinement of Vizing's Theorem. He also conjectured that multigraphs whose chromatic index exceeds  $\Delta + 1$  are *elementary* in some sense (which he defined precisely), and he proved the conjecture for a few small cases. In this talk, I will define Goldberg's notion of *elementary*, and I will explore a possible method of proof of his conjecture, motivated by Goldberg's proof of his partial result. This talk is based on work in progress.