

# The chromatic index of strongly regular graphs

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## Abstract

We determine (partly by computer search) the chromatic index (edge-chromatic number) of many strongly regular graphs (SRGs), including the SRGs of degree  $k \leq 18$  and their complements, the Latin square graphs and their complements, and the triangular graphs and their complements. Moreover, using a recent result of Ferber and Jain, we prove that an SRG of even order  $n$ , which is not the block graph of a Steiner 2-design or its complement, has chromatic index  $k$ , when  $n$  is big enough. Except for the Petersen graph, all investigated connected SRGs of even order have chromatic index equal to  $k$ , i.e., they are class 1, and we conjecture that this is the case for all connected SRGs of even order.

*Keywords:* Strongly regular graph, chromatic index, edge coloring, 1-factorization.

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# Kromatični indeks krepko regularnih grafov

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## Povzetek

Določimo (deloma s pomočjo računalnika) kromatični indeks (povezavno kromatično število) mnogih krepko regularnih grafov, vključno s krepko regularnimi grafi stopnje  $k \leq 18$  in njihovimi komplementi, grafi latinskih kvadratov in njihovimi komplementi ter trikotnimi grafi in njihovimi komplementi. Poleg tega, z uporabo nedavnega rezultata Ferberja in Jaina, dokažemo, da ima krepko regularen graf sodega reda  $n$ , ki ni bločni graf Steinerjevega 2-načrta ali njegovega komplementa, kromatični indeks  $k$ , če je  $n$  dovolj velik. Razen za Petersenov graf imajo vsi raziskani povezani krepko regularni grafi sodega reda kromatični indeks enak  $k$ , kar pomeni, da sodijo v razred 1; postavimo domnevo, da je to res za vse povezane krepko regularne grafe sodega reda.

*Ključne besede:* Krepko regularen graf, kromatični indeks, barvanje povezav, 1-faktorizacija.

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