

Coloring squares of planar graphs with prescribed girth

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The square of a graph G is the graph with the same vertex set as G and two distinct vertices are adjacent iff they are on distance at most 2 in G .

Wang and Lih conjectured that for every $g \geq 5$, there exists a number $M(g)$ such that the chromatic number of the square of every planar graph of girth at least g and maximum degree $\Delta \geq M(g)$ is $\Delta + 1$. In the talk will be disproved this conjecture for $g = 5, 6$ and prove the existence of the number $M(g)$ for $g \geq 7$. We also show that the square of every planar graph of girth at least six and sufficiently large maximum degree Δ is $(\Delta + 2)$ -colorable. The talk will conclude by posing few problems.