



ACYCLIC EDGE COLORING OF SPARSE GRAPHS

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An acyclic edge coloring of a graph is a proper edge coloring without bicolored cycles. The acyclic chromatic index of a graph G , denoted by a $\chi'_a(G)$, is the smallest possible number of colors in an acyclic edge coloring of G .

Alon, Sudakov, Zaks, and independently Fiamčík, conjectured that a $\chi'_a(G) \leq \Delta(G) + 2$ for any graph G . The conjecture was confirmed for several classes of sparse graphs, defined by conditions on maximum (average) degree and/or girth, as well for some classes of planar graphs. For some more particular graph classes it was even proved that they are acyclically $(\Delta + 1)$ - or Δ -edge-colorable, respectively.

We prove that graphs with $\Delta(G) \geq 14$ and $\text{mad}(G) < 4$ are acyclically $(\Delta + 1)$ -edge-colorable.