A snark is a connected, bridgeless cubic graph with chromatic index equal to 4. In [1] it was conjectured that there are no snarks amongst Cayley graphs. (A Cayley graph on a group $G$ relative to a subset $S = S^{-1} \subseteq G \setminus \{1\}$ has vertex set $G$ and edges of the form $\{g, gs\}, g \in G, s \in S$.) It follows from [2, 4] that giving an answer to the above conjecture essentially boils down to determining whether there are snarks amongst Cayley graphs on simple groups.

We will present an innovative approach to finding a possible solution to the above conjecture combining the theory of Cayley maps with a classical result about maximum dominating forests in cyclically 4-edge connected cubic graphs [3]. Partial results obtained with this approach will be discussed in detail.

**Keywords:** snark, cubic graph, coloring, Cayley graph.

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**References**

