

# Some Conjectures on the Signless Laplacian Spectral Radius of Graphs

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## Abstract

In [Linear Algebra Appl. 432(2010) 3319-3336], Hansen and Lucas proposed some conjectures of the form  $f(n) \leq q_1(G) \oplus i(G) \leq g(n)$ , where  $q_1(G)$  denotes the signless Laplacian spectral radius of graph  $G$ ,  $\oplus$  is one of the four operations  $+$ ,  $-$ ,  $\times$ ,  $/$ , and  $i(G)$  is another invariant chosen among minimum, average and maximum degree, average distance, diameter, radius, girth, proximity, remoteness, vertex, edge and algebraic connectivities, independence number, domination number, clique number, chromatic number and matching number, and Randić index. In this topic, we first determine the maximal signless Laplacian spectral radius among all connected graphs with given diameter or radius, and then solve two conjectures involving the diameter or radius of graphs. We also disprove a conjectures concerning the independence number of graphs.