

Rigidity and eigenvalues of graphs

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In 1982, Lovasz and Yemini proved that every 6-connected graph is rigid. Consequently, if Fiedler's algebraic connectivity of a graph G is greater than 5, then G is rigid. With Sean Dewar and Xiaofeng Gu, we showed that for a graph with minimum degree >5 , if the algebraic connectivity is greater than $2+1/(d-1)$, then G is rigid, and if the algebraic connectivity is greater than $2+2/(d-1)$, then G is globally rigid. Our results imply that every Ramanujan graph with degree at least 8 is globally rigid. With Sean Dewar, Georg Grasegger and Xiaofeng Gu we extended these results to Ramanujan graphs of degree less than 8. In this talk, I will give an overview of these results.