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Grant I. Fickes and **Dylan P. Green***, TNU Department of Science and Mathematics, 333 Murfreesboro Pike, Nashville, TN 37210, and **Karen B. McCready**, **Kathleen M. Ryan**, **Nathaniel J. Sauerberg** and **Jill K. Stifano**. *Maximum proper diameter of 2-connected graphs*. Preliminary report.

A properly colored path is a path in which no two consecutive edges have the same color. A properly connected coloring of a graph is one in which there exists a properly colored path between every pair of vertices. Given a graph G with a properly connected coloring, the proper distance between any two vertices is the length of a shortest properly colored path between them. Furthermore, the proper diameter of G is the largest proper distance between any pair of vertices in G . Since the proper diameter of G is a function of its coloring, we can refer to the maximum proper diameter of G , that is, the maximum value of the proper diameter across all properly connected colorings of G .

If G has n vertices, a natural upper bound for its maximum proper diameter is $n - 1$ but this value is not attainable for all graphs, such as graphs without a Hamiltonian path. We introduce a new family of graphs, \mathcal{T}_n graphs, and we show that a 2-connected graph on n vertices with a properly connected 2-coloring has a maximum proper diameter of $n - 1$ if and only if the graph is a \mathcal{T}_n graph. (Received July 23, 2018)