On the hyperbolicity constant of extended chordal graphs.

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Abstract

If X is a geodesic metric space and $x_1, x_2, x_3 \in X$, a geodesic triangle $T = \{x_1, x_2, x_3\}$ is the union of the three geodesics $[x_1 x_2]$, $[x_2 x_3]$ and $[x_3 x_1]$ in X. The space X is δ-hyperbolic (in the Gromov sense) if any side of T is contained in a δ-neighborhood of the union of the other two sides, for every geodesic triangle T in X. In this work we extend in two ways (edge-chordality and path-chordality) the classical definition of chordal graphs in order to relate this property with Gromov hyperbolicity. In fact, we prove that every edge-chordal graph is hyperbolic and that every hyperbolic graph is path-chordal. Furthermore, we prove that every path-chordal cubic graph with small path-chordality constant is hyperbolic.