SHELLABLE CACTUS GRAPHS

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ABSTRACT. Studying vertex decomposable, shellable or (sequentially) Cohen-Macaulay graphs has attracted significant attention of researchers working in the borderline of combinatorial commutative algebra and algebraic combinatorics. Recently Woodroofe showed that all five chordal graphs with no chordless four cycles are vertex decomposable. In this talk we determine a class of vertex decomposable graphs including chordal graphs and graphs considered by Woodroofe. Motivated by Francisco, Hà and Villarreal's works, we study the effect of adding whiskers, ears and cycles C_3 or C_5 to a graph. Our theorems give us a criteria to construct more vertex decomposable graphs by making some modification on graphs. Taking advantage of new constructed vertex decomposable graphs, all vertex decomposable, shellable and sequentially Cohen-Macaulay cactus graphs are determined. Moreover, it is shown that a cactus graph is vertex decomposable if and only if it is sequentially Cohen-Macaulay.

This is a joint work with D. Kiani and S. Yassemi.

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