

ON THE COMPLEXITY OF MONOMIAL IDEALS ASSOCIATED TO GRAPHS

S. A. SEYED FAKHARI

Let \mathbb{K} be a field. To any finite simple graph G with vertex set $V(G) = \{v_1, \dots, v_n\}$ and edge set $E(G)$, one associates an ideal $I(G) \subset \mathbb{K}[x_1, \dots, x_n]$ generated by all monomials $x_i x_j$ such that $\{v_i, v_j\} \in E(G)$. The ideal $I(G)$ is called the *edge ideal* of G and was first introduced by Villarreal in 1990. Subsequently, many people, have been working on a program to build a dictionary between the algebraic properties of $I(G)$ and the combinatorial structure of G . In this talk, we recall the notion of Castelnuovo-Mumford regularity which is a fundamental invariant in commutative algebra and measures the complexity of a graded module. Next, we review the recent developments about the Castelnuovo-Mumford regularity of edge ideals and their powers.

E-mail address: s.seyedfakhari@uniandes.edu.co