

REGULARITY OF POWERS OF EDGE IDEALS

SELVI BEYARSLAN

ABSTRACT. Let G be a graph and let $I = I(G)$ be its edge ideal. In this research, when G is a forest or a cycle, we explicitly compute the regularity of I^s for all $s \geq 1$. In particular, for this class of graphs, we provide the asymptotic linear function $\text{reg}(I^s)$ as $s \gg 0$, and the initial value of s starting from which $\text{reg}I^s$ attains its linear form. We also give new bounds on the regularity of I when G contains a Hamiltonian path when G is a Hamiltonian graph.