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*Lower Bounds for the depth of powers of edge ideals of graphs*

We consider a simple graph its corresponding edge ideal  $I$  in a polynomial ring  $R$ . It is well known that upper bounds for the projective dimension of  $R/I$  provide lower bounds for the first non-zero homology group of the graph's independence complex. Determining upper bounds for the projective dimension of  $R/I$  is equivalent to finding lower bounds for the depth of  $R/I$ . We discuss such bounds as well as lower bounds for the depth of higher powers of the edge ideal. This is joint work with Susan Morey.