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Depth and Regularity of Regular and Symbolic Powers of Monomial Ideals

This talk will cover recent results related to the depth and regularity of general monomial ideals with a goal of applying the results to determine related properties of regular and symbolic powers of square-free monomial ideals. In recent work with Jose Martinez-Bernal, Rafael Villarreal, and Carlos Vivares, polarization was used to examine how altering the powers of variables in monomial generators affects the depth and regularity of the ideal. As an application, we are able to identify classes of square-free monomial ideals for which the powers, or the symbolic powers, have non-increasing depth and non-decreasing regularity.