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Motivation and history of some recent conjectures comparing symbolic and ordinary powers of ideals

Work in transcendence theory led Waldschmidt, Skoda and Chudnovsky in the 70s to give bounds, using complex analytic methods, on the least degree of a polynomial vanishing to given order at each point of a finite general set of points in a finite dimensional complex affine space. These bounds were soon improved by Esnault and Viehweg using vanishing theorems from algebraic geometry. It turns out some of these results (and more general versions of them) are easy consequences of recent purely algebraic work comparing symbolic and ordinary powers of ideals in polynomial rings. This fact has led the speaker, in joint work with C. Huneke, to propose conjectures which would imply all of the former results. This talk will discuss the framework and some of the evidence which induced the speaker and Huneke to pose the conjectures, some of which go well beyond anything previously proved or imagined.