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*Some Containment Results for Fat Points*

The fact that symbolic powers of an ideal are often not the same as the ordinary powers is central to many problems in algebraic geometry and commutative algebra. Studying the extent to which they differ has raised the question of which symbolic powers an ordinary power contains. For a homogeneous ideal  $I$  in the polynomial ring  $k[x_0, \dots, x_N]$ , it is well-known that the symbolic power  $I^{(rN)}$  is contained in the regular power  $I^r$  for all  $r > 0$ . In hopes of a tighter containment, Harbourne and Huneke recently formulated a number of conjectures that relate symbolic and regular powers of ideals of fat points in projective space. In this talk we will consider some of these conjectures for a variety of configurations of points. The results come from two joint projects - one joint with C. Bocci and B. Harbourne and the other joint with S. G. Hartke.