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David Eisenbud* (de@msri.org), 1336 Summit Rd, Berkeley, CA 94708. *The Regularity of Powers of an Ideal*. Preliminary report.

Let I be a homogeneous ideal in a polynomial ring over a field. By a theorem of Cutkosky-Herzog-Trung and Kodiyalam, the Castelnuovo-Mumford regularity of the n -th power of I grows linearly with n when n is large. The leading term is known; the place where linearity begins, and the constant term, are mysterious. I will show how to identify these numbers in a very special case, and present a conjecture dealing with a slightly less special case. This is a very preliminary report on joint work with Craig Huneke. (Received March 07, 2006)