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Craig Huneke, Paolo Mantero* (mantero@math.ucr.edu), **Jason McCullough** and **Alexandra Seceleanu**. *Ideals having high multiplicity*. Preliminary report.

Initially motivated by our proof of a very special case of Stillman's Question, we prove an upper bound for the multiplicity of a wide class of Cohen-Macaulay ideals. Remarkably, ideals whose multiplicity achieve this upper bound have high depth and the Cohen-Macaulay property can be detected by a numerical condition. Moreover, there are several analogies between these ideals of 'maximal multiplicity' and ideals of multiplicity one.

We prove a sufficient (implicit) condition for ideals to have 'maximal multiplicity', and we employ it to exhibit classes of ideals satisfying this property (e.g. rational normal scrolls). Finally, we provide applications to quasi-Gorenstein ideals and a multiplicity-based sufficient condition for quasi-Gorenstein ideals to be Gorenstein. (Received August 08, 2013)