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Javid Validashti* (jvalidas@illinois.edu). *Multiplicity Sequence of Graded Algebras*. Preliminary report.

Let $A \subset B$ be a homogeneous inclusion of finitely generated standard graded algebras over a Noetherian local ring. We define a sequence of numbers for the pair $A \subset B$ that unify several notions of multiplicities, including the Buchsbaum-Rim multiplicity of modules or more generally the relative multiplicities of Simis, Ulrich and Vasconcelos, the j -multiplicity of ideals introduced by Achilles and Manaresi as well as the j -multiplicities of the pair $A \subset B$ defined by Ulrich and Validashti, and the multiplicity sequence of an ideal described by Achilles and Manaresi. Using our invariants, we study numerical criteria for integrality of the extension $A \subset B$. (Received September 07, 2013)