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Thuy Pham* (tpham@utsc.utoronto.ca), Department of Mathematics, University of Toronto, Toronto, Ontario M5S 2E4, Canada. *Integral closure and estimation of jdeg.*

Given a finitely generated graded module over a graded ring, there are several extensions of the classical multiplicity to measure the size and complexity of the module. In this talk, we will discuss how to use jdeg , one of those generalized multiplicities, to bound the length of the chains of graded sub algebras between an algebra and its integral closure. Particularly, in the case of the Rees algebra $R[It]$ of an ideal I , the length of these chains is bounded in terms of $\text{jdeg}(\text{gr}_I(R))$. We will then show that certain estimation for $\text{jdeg}(\text{gr}_I(R))$ can be obtained using the tools of Approximation Complexes. (Received August 06, 2007)