Fourth Seminar in Commutative Algebra and Related Topics,
November 28-29, 2007, IPM, Tehran

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&
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R. Jafari
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Some Results on Cofinite Modules and Local Cohomology

A. R. Naghipour
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Let R be a commutative Notherian ring, $\mathfrak{a} \subseteq \mathfrak{b}$ two ideals of R and M an $\mathfrak{a}$-cofinite R-module. For a non negative integer n, we prove that $H^n_{\mathfrak{b}}(M)$ is $\mathfrak{b}$-cofinite whenever $H^n_{\mathfrak{b}}(M)$ is Artinian and $H^i_{\mathfrak{b}}(M)$ is $\mathfrak{a}$-cofinite for all $i < n$.
We generalized the Rees characterization of grade for $\mathfrak{a}$-cofinite modules and as a consequence, we extend the non-vanishing Grothendiecks Theorem and we shall show that the first non-vanishing local cohomology module $H^t_{\mathfrak{c}}(M)$, where $\mathfrak{c}$ is an ideal of R such that $cM \neq M$ and $t = \text{grade}\ (\mathfrak{c}, M)$, has only finitely many associated primes.

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Cofinitenes of Local Cohomology Modules over Noetherian Rings

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Let R be a (not necessarily local) Noetherian ring and let M be a nonzero finitely generated R-module of finite dimension d. Let I be an ideal of R such that dim $R/I = 1$. In this talk, the main result asserts that the local cohomology modules $H_I^i(M)$ are I-cofinite; that is, $\mathrm{Ext}_R^j(R/I, (H_I^i(M))$ is finitely generated for all i, j. Then the Bass numbers of $H_I^i(M)$ are finite for all i. This generalizes the main results of Delfino-Marley [1], Yoshida [3] and [2, Main Theorem].

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The Simplicial Join

H. Sabzrou
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This is based on a joint work with M. Tousi and S. Yassemi.
Let Δ and Δ' be two simplicial complexes over two disjoin vertex sets. The simplicial join $\Delta * \Delta'$ is defined to be the simplicial complex whose simplicies are of the form $\sigma \cup \sigma'$ where $\sigma \in \Delta$ and $\sigma' \in \Delta'$. The aim of this talk is to study some algebraic and combinatorial properties of the simplicial join $\Delta * \Delta'$ through the properties of Δ and Δ'.

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Bounds on Regularity of Grade Modules with Local Base Ring of Dimension One

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Let M be a finitely generated graded module over a Noetherian homogeneous ring R with local base ring $(R_0, \mathfrak{m}_0, k)$ where k denotes the residue field of R_0. In this talk we will show that the regularity of graded modules can be bounded in terms of some bounding functions where R_0 is of dimension one. We will improve these bounds by setting some additional conditions on the local base ring R_0. The theme of this talk gives arise some questions on the regularity of graded modules when the local base ring R_0 is of dimension two.