

BRIEF SUMMARY OF PHD THESIS

Title: **Upper Bound for the Castelnuovo-Mumford regularity.**

Specialization: Algebra and Number theory.

Code: 62.46.01.04.

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New results presented in the thesis

1. Let (A, \mathfrak{m}) be a local ring, I an \mathfrak{m} -primary ideal and M a finitely generated A -module. In this thesis, three upper bounds on the Castelnuovo-Mumford regularity of associated graded module are given in terms of the so-called extended degree, the lengths of certain local cohomology modules and Hilbert coefficients. If M is a finitely generated graded module, an upper bound on $\text{reg}(G_I(M))$ also is given in terms of $\text{reg}(M)$. In the case of dimension one, a sharp bound for $\text{reg}(G_I(M))$ is given in term of Hilbert coefficients of M . It is also investigated when the bound is attained.

2. We give upper bounds on the Castelnuovo-Mumford regularity of fiber cone in terms of extended degree.

3. We show that the last t Hilbert coefficients $|e_{d-t+1}(I, M)|, \dots, |e_d(I, M)|$ are bounded below above in terms of the first $d - t + 1$ Hilbert coefficients $e_0(I, M), \dots, e_{d-t}(I, M)$, where $t = \text{depth}(M)$.

Scientific advisors

Hanoi, March 19, 2013
PhD student

Prof. Dr. Sc. Le Tuan Hoa

Lê Xuan Dung