Meeting: 1003, Atlanta, Georgia, SS 20A, AMS Special Session on Commutative Algebra, I

1003-13-596 **Sankar P. Dutta*** (`dutta@math.uiuc.edu`), Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801. *Intersection Multiplicity on Smooth Varieties.* Preliminary report.

Let X be a smooth projective variety over an algebraically closed field k. Let Y and Z be two closed subvarieties of X. Let $\chi^{\mathcal{O}_X}(\mathcal{O}_Y, \mathcal{O}_Z)$ represent $\sum_{(-1)}^{i+j} \dim_K H^i\left(X, \operatorname{Tor}_j^{\mathcal{O}_X}(\mathcal{O}_Y, \mathcal{O}_Z)\right)$. We propose to prove the following:

Theorem 1. *Let X, Y, and Z be as above. We have the following:*

a *if* $\dim Y + \dim Z < \dim X$, *then* $\chi^{\mathcal{O}_X}(\mathcal{O}_Y, \mathcal{O}_Z) = 0$.

b) *if* $\dim Y + \dim Z = \dim X$ *and the tangent sheaf* T_X *is generated by global sections, then* $\chi^{\mathcal{O}_X}(\mathcal{O}_Y, \mathcal{O}_Z) \geq 0$.

We would also like to point out that the conclusion in b) may fail to hold if T_X is not generated by global sections. (Received September 23, 2004)