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Title: Hilbert-Kunz multiplicity and Hilbert-Kunz slope

Abstract: In this talk we recall the notions of characteristic p invariants of a ring (commutative and Noetherian), namely *Hilbert-Kunz function* and *Hilbert-Kunz multiplicity*, introduced by P. Monsky in 1980's. They seem to be an analogue of the Hilbert-Samuel function and the classical multiplicity. Here we concentrate on HK multiplicity, which is a more subtle invariant of a ring (compare to classical multiplicity): It is related to characteristic p features of the singularities of the ring. Here we will give an overview of results and some known computations of the HK multiplicity.

In the case of projective curves, we (H. Brenner and myself independently) relate the HK multiplicity with the Frobenius semistability of the associated Syzygy bundle which implies that the HK multiplicity is a rational number in such cases.

In higher dimension one proves that, though Frobenius semistability is not an 'open' condition, an invariant associated to the Frobenius instability degree, namely *Hilbert-Kunz slope* $= \mu_{HKJ} \rightarrow 0$ as the characteristic $p \rightarrow \infty$