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Depth and dimension for high syzygies

This talk will focus on the asymptotic behavior of two invariants, depth and dimension, for syzygies of a finitely generated module of infinite projective dimension over a commutative local noetherian ring. It is already known, by work of Okiyama (1991), that the depths of such syzygies eventually stabilize to that of the ring. This result is natural, given the intimate connection between depth and free resolutions. However, formulating a similar statement for dimension is not as straightforward. In this talk, we will give necessary conditions for the stabilization of dimensions of syzygy modules. In particular, we will show that all high syzygies of a module with eventually non-decreasing Betti numbers over an equidimensional ring have dimension equal to the dimension of the ring.