

Meeting: 999, Nashville, Tennessee, SS 8A, Special Session on Algebraic Geometry and Commutative Algebra

999-14-84 **Anthony A. Iarrobino Jr.*** (a.iarrobino@neu.edu), Mathematics Department, 567 Lake, Northeastern University, 360 Huntington Avenue, Boston, MA 02115. *Consecutive Genera for Irreducible ACM Space Curves*. Preliminary report.

Given a degree d , let $g_0 = g_0(d)$ denote the lowest genus of an irreducible ACM space curve of degree d . We give a lower bound for the length t of the longest sequence of adjacent genera $g_0, g_0 + 1, \dots, g_0 + \ell - 1$ that occur for degree- d irreducible arithmetically Cohen-Macaulay space curves X . We show that for d large there is an initial consecutive sequence of such genera having length ℓ asymptotic to

$$\ell \cong c_1 d^{1.6} \cong c_2 g_0^{16/15}.$$

Several authors, Gruson-Peskine, Ellingsrud, Maggione-Ragusa, Geramita-Migliore, have shown that the h -sequence $T = \Delta^2 H(O_X)$ of X is a length- d *decreasing* Hilbert function $T = H(A)$ of an Artinian height two algebra A , quotient of O_X by generic linear forms. The genus of X is essentially the moment of the graph of T about $i = 1$. Thus, the above problem is equivalent to a combinatorial problem of finding a sequence of decreasing T of length d , having consecutive moments. We give several combinatorial approaches to this problem. We obtain the lower bound by studying certain sequences T , that are *blocked* under an operation of “rolling balls”. (Received August 11, 2004)