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# ON EQUATIONS DEFINING ARITHMETICALLY COHEN-MACAULAY SCHEMES, II

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In this note we continue our study of *arithmetically Cohen-Macaulay* (CM for short) schemes (cf. [T]). We apply Petri's approach.

In the first section we generalize the classical Enriques-Petri theorem about the ideal defining a canonical curve (cf. [G-H1, ch. 4, p. 535], [S-D2], [Sh]). Our Theorem 1.1 implies that the ideal of a nondegenerate integral CM curve $C \subset \mathbf{P}^{\nu}$ of degree $\mu \leqslant (m-1)(\nu-1)$ is generated by forms of degree less than or equal to $m-1$. It is a natural extension of the Enriques-Petri theorem ($m=4$, $\mu=2\nu$) and a theorem of Saint-Donat ($m=3$) [S-D1].

In the second section we generalize the results of Arbarello and Sernesi about equations of plane curves [A-S2]. They have found beautiful *determinantal* representations for the equations of plane curves. In a such determinantal representation, the minors relative to the elements of the last row define the adjoint locus of a curve. We extend these results to hypersurfaces of any dimension (Theorems 2.7 and 2.10).

Using the determinantal representation of a plane curve and especially the one of its adjoint ideal, Arbarello and Sernesi were able to give a rigorous proof of Severi's theorem which states that *the moduli space of curves of genus less than* 11 *is unirational*. In particular, the determinantal representations allow to relate deformations of a hypersurface and its subadjoint locus. We believe that our results will also find interesting applications; see also 2.12–2.14.

The results of this note are independent of our previous paper [T]. Nevertheless, acquaintance with that paper would help to put the results of this note in perspective.

We work over a fixed *algebraically closed* field $\Omega$. *All varieties are reduced irreducible algebraic $\Omega$-schemes.*

We are grateful to Dr. Enrico Arbarello and Professor Boris Moishezon for their encouragement and interesting remarks. In particular, Arbarello communicated to me an observation made by Sernesi that results of their paper [A-S2] hold for *any* curve in $\mathbf{R}^2$. During the preparation of the manuscript, we have learned that Dr. Ciro Ciliberto has been dealing with canonical surfaces in $\mathbf{P}^3$ for some time. In particular, he was working on the generalization of the results of Arbarello and Sernesi [A-S2] (his manuscript is in preparation). Ciliberto also pointed out one mistake in the first version of this note.

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