DEFORMATION OF FINITE MORPHISMS AND THE CONSTRUCTION OF SIMPLE CANONICAL SURFACES

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ABSTRACT

This talk will address two themes. First we will deal with the theory of deformations of a morphism to obtain a criterion, of infinitesimal character, to assure when a morphism from a smooth variety to projective space, finite onto a smooth image, can be deformed to a morphism of degree 1 or, even, to an embedding. Deforming such a morphism to an embedding has interesting applications. For instance, we used this technique to smooth multiple structures. This technique can, as well, be used to prove the existence of varieties of given invariants embedded in a given projective space. This relates to the second theme of this talk, which is to show how to use this deformation theory of finite morphisms to give a new method of constructing simple canonical surfaces. The problem of constructing simple canonical surfaces (i.e., surfaces of general type having birational canonical map), already posed by Enriques, has received, in recent years, the attention of several authors like Ashikaga, Catanese and others. In any case, constructing simple canonical, or canonical, surfaces is not an easy problem. Here lies the interest of our method, which produces some new simple canonical surfaces and has the plus of producing simple canonical surfaces whose canonical map is not only birational but also a finite morphism.

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[1]joint work with Francisco Javier Gallego and Bangere P. Purnaprajna