Vector bundles and Cohen–Macaulay modules

Yuriy A. Drozd

May 8, 2002

This talk is a survey on the applications of matrix problems to study of vector bundles over projective curves and Cohen–Macaulay modules over surface singularities. The main results that shall be covered are:

1. A complete classification of curves (both smooth and singular) of finite, tame and wild vector bundle type.

2. A description of vector bundles in finite and tame cases.

3. A description of Cohen–Macaulay modules over cusp surface singularities, as well as over hypersurface singularities of types T_{pqr}.

4. A criterion for a minimally elliptic singularity to be of tame or wild Cohen–Macaulay type.

I am also going to recall some background results, such as Atiyah's classification of vector bundles over elliptic curves and Kahn's correspondence between Cohen–Macaulay modules over a surface singularity and vector bundles over the exceptional curve of its resolution.