

On the construction of minimal involutive varieties

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Abstract:

In a paper published in 1988, J. Bernstein and V. Lunts proposed a geometric construction of nonholonomic irreducible modules over the Weyl algebra. The key concept behind their work is that of a minimal involutive homogeneous variety, which is an involutive homogeneous variety of complex affine $2n$ -space which does not contain any proper involutive homogeneous subvarieties. Recall that an affine variety is involutive if its ideal is closed for the Poisson bracket defined by the standard symplectic structure of $2n$ -space. In their paper, Bernstein and Lunts also proved that a generic homogeneous hypersurface of degree at least 3 in 6-dimensional affine space is minimal involutive homogeneous. However, until recently, only one concrete example of such a variety was known. In this talk I will present a construction of simple families of minimal homogeneous involutive hypersurfaces of degrees 3 and 4 in 6-dimensional complex affine space. This is joint work with Cláudio Saccomori Jr from UFRRJ.