

## abstract

COMPLEX ALGEBRAIC GEOMETRY

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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The talk is based on the joint work with Boris Doubrov. First we will describe a new rather effective procedure of symplectification for the problem of local equivalence of nonholonomic vector distributions. The starting point of this procedure is to lift a distribution  $D$  to a special odd-dimensional submanifold  $W_D$  of the cotangent bundle, foliated by the characteristic curves (the abnormal extremals of the distribution  $D$ ). In particular, if  $D$  is a rank 2 distribution then the submanifold  $W_D$  is nothing but the annihilator of the square of  $D$ , denoted by  $(D^2)^\perp$ , while if  $D$  is a distribution of odd rank it is the annihilator of  $D$  itself. The dynamics of the lifting (to  $W_D$ ) of the distribution  $D$  along the characteristic curves (of  $W_D$ ) is described by certain curves of flags of isotropic and coisotropic subspaces in a linear symplectic space. So, the problem of equivalence of distributions can be essentially reduced to the differential geometry of such curves: symplectic invariants of these curves automatically produce invariants of the distribution  $D$  itself and the canonical frame bundles, associated with such curves can be in many cases effectively used for the construction of the canonical frames of the distributions  $D$  itself on certain fiber bundles over  $W_D$ . In this way we succeeded to construct the canonical frames for germs of rank 2 distributions in  $\mathbb{R}^n$  with  $n > 5$  and of rank 3 distributions in  $\mathbb{R}^n$  with  $n > 6$  from certain generic classes. The first case generalizes the classical work of E. Cartan (1910) on rank 2 distributions in  $\mathbb{R}^5$ . The second case is also new: the only rank 3 distributions with functional invariants, treated before, were rank 3 distributions in  $\mathbb{R}^5$  (Cartan, 1910) and in  $\mathbb{R}^6$  (N. Tanaka school and independently R. Bryant in 70th). In all these cases the most symmetric models will be given as well.

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