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Vladislav A. Kibkalo

Degenerate singularities of integrable systems and their bifurcations

We will discuss several up-to-date problems on corank-1 degenerate singularities of integrable systems. Majority of them are also connected with the problem of structural stability in various senses.

1) Parabolic and cuspidal singularities: their definition (L.M. Lerman and Ya.L. Umanskii, 1994), the Bolsinov-Kudryavtseva criterion for a singularity to belong to such classes (2018), several theorems on structural stability (L.M. Lerman and Ya.L. Umanskii, 1994; A.V. Bolsinov and E.A. Kudryavtseva, 2018; E.A. Kudryavtseva and N.N. Martynchuk, 2021).

2) Parabolic and cuspidal singularities do occur in integrable systems from mechanics and mathematical physics: the Kovalevskaya top (V.A. Kibkalo and E.A. Kudryavtseva), its analogs on the Lie algebras so(3,1) and so(4) and the Zhukovsky integrable case for a rigid body of revolution (V.A. Kibkalo).

3) Parabolic and cuspidal singularities (s = 1), as well as elliptic and hyperbolic "period doubling" (s = 2) are extended to an infinite series of parabolic singularities with resonances (with resonance order s = 1,2,3, ...), which also turn out to be structurally stable in IHS with 2 degrees of freedom (V.V.Kalashnikov 1998); their bifurcations at s = 1,2,4,5,6 are structurally stable in IHS with 3 degrees of freedom (G.Wassermann, 1988; E.A. Kudryavtseva and M.V. Onufrienko).

4) Describing topology of the Liouville foliation near a singularity belonging to the indicated series for different values of s (L.M. Lerman, 2000; V.A. Kibkalo and E.A. Kudryavtseva).

SCIENTIFIC SEMINAR
"DIFFERENTIAL GEOMETRY AND APPLICATIONS"

headed by Academician of RAS Anatoly T. Fomenko

The seminar takes place online in ZOOM on Mondays
from 4:45 p.m. to 6:20 p.m. (Moscow time)
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