

Singularities in Geometry and Topology in honour of Sabir Gussein-Zade with occasion of his 60th birthday.
El Escorial, Madrid, October 10-16th 2010

Arnold's interior scattering and sub-Riemannian geometry

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SUMMARY

Mathematical theory of interior scattering of waves was developed by V.I. Arnold about 20 years ago. (From physical point of view this phenomenon is very specific and difficult to observe because it happens only in anisotropic non-homogeneous media.) Recently an amazing and absolutely unexpected connection between wave fronts, scattered interiorly, and sub-Riemannian equidistant loci has been observed. The point is that both these objects are described by an eikonal equation with the same conical singularities, normal forms of which were discovered by V.I. Arnold in 1988. I am going to talk about Arnold's interior scattering itself, its connection with sub-Riemannian geometry, and a few open problems in this area.

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