

Singular hyperbolicity and star flows

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Abstract:

For vector fields on 3 dimensional manifolds, the structure "singular hyperbolicity" seems to be the answer to most robust phenomena which involving singular point.

In higher dimension, that is no more the case. The natural extension of the notion of singular hyperbolicity prevents two singular points of different indices to be in the same class.

With Adriana da Luz, we build an example of star flow X (i.e. any periodic orbit of any vector field Y C^1 -close to X is hyperbolic) on a 5-manifold, having two singular points p, q , of indices 2 and 3 respectively, which are robustly in the same chain recurrence class.

We also present the notion of singular hyperbolicity which makes possible such a construction.