Luis Eduardo Osorio Acevedo (São Paulo, Brazil).

Small volumes implies small diameters, via an intrinsic monotonicity formula in Riemannian manifolds

We want to present another purely intrinsic proof that for small volumes isoperimetric regions are of small diameter in manifolds with some type of bounded geometry based on a monotonicity formula for varifolds of bounded generalized mean curvature which allows us to use an argument inspired from the correspondent extrinsic proof of [1] and combining it with our cut and paste argument to give finally the principal result of this poster. The monotonicity formula that we use here is an adaptation of Theorem 2.1 and Proposition 2.2 of [2] to our intrinsic Riemannian context via Hessian comparison theorems for the distance function. At our knowledge this is the first time that such an intrinsic approach appears in the literature, although being a very natural one. The applications of this methods are wide and opens the doors for extending in a rigorous way to a Riemannian ambient manifold the geometric measure theory known in $\mathbb{R}^n$, without using the Nash's isometric embedding theorem. This is a joint work with Stefano Nardulli (UFABC-CMCC).

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Antonio Victor da Silva Junior (São Paulo, Brazil).

Approximate solutions of vector fields and an application to Denjoy-Carleman regularity of solutions of a nonlinear PDE

In this paper we study microlocal regularity of a $\mathcal{C}^2$ solution u of the equation

$$u_t = f(x, t, u, u_x),$$

where $f(x, t, \zeta_0, \zeta)$ is ultradifferentiable in the variables $(x, t) \in \mathbb{R}^N \times \mathbb{R}$ and holomorphic in the variables $(\zeta_0, \zeta) \in \mathbb{C} \times \mathbb{C}^N$. We proved that if $\mathcal{C}^{\mathcal{M}}$ is a regular Denjoy-Carleman class (including the quasianalytic case) then:

$$\mathrm{WF}_{\mathcal{M}}(u) \subset \mathrm{Char}(L^u),$$

where $\mathrm{WF}_{\mathcal{M}}(u)$ is the Denjoy-Carleman wave-front set of u and $\mathrm{Char}(L^u)$ is the characteristic set of the linearized operator L^u:

$$L^u = \frac{\partial}{\partial t} - \sum_{j=1}^{N} \frac{\partial f}{\partial \zeta_j}(x, t, u, u_x)\frac{\partial}{\partial x_j}.$$

This is a joint work with N. Braun Rodrigues.

Max Reinhold Jahnke.

Top-degree solvability in hypocomplex structures with applications to left-invariant hypocomplex structures on compact Lie groups

We use the theory of DFS spaces and tools related to Čech cohomology to establish a sufficient condition for top-degree solvability for the differential complex associated to a hypocomplex locally integrable structure. As an application, we show that the top-degree cohomology of left-invariant hypocomplex structures on a compact Lie group can be computed only by using left-invariant forms, thus reducing the computation to a purely algebraic one.

Jorge Marques (Coimbra, Portugal).

On the well-posedness of Goursat problems in Gevrey classes

Some authors, Nishitani [5], Hasegawa [3], Carvalho e Silva [4], have investigated the C^∞ well-posedness of Goursat problems for linear PDE's with constant coefficients. I am interested in trying to find necessary and sufficient conditions for the generalized Goursat problem to be well-posed in the Gevrey classes Γ^s with $s > 1$.

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