

Séminaire d'algèbre, topologie et géométrie
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Salle de conférences

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On the Birkhoff problem for Lagrangian invariant tori

Let S be a smooth Lagrangian torus that is invariant by the geodesic flow of a Riemannian metric in the n -torus. We show that if S contains a uniformly continuous curve $c : \mathbb{R} \rightarrow S$ whose canonical projection has totally irrational asymptotic homology, then S is a graph of the canonical projection. Moreover, we show that the set of asymptotic homologies of recurrent orbits of the canonical projection of any Lagrangian graph are contained in a positive cone of the stable norm. This fact is in contrast with what might happen at the Mañé's critical level, where we may have Lagrangian graphs given by flows with Reeb components, and therefore having orbits with opposite asymptotic homologies. We shall discuss many other consequences of the asymptotic homology structure of Lagrangian graphs if time allows. These results are joint works with Mario Jorge D. Carneiro and Alfonso Sorrentino.

Bibliography : On the graph Theorem for Lagrangian invariant tori with totally irrational invariant sets. Mario J. Dias Carneiro, Rafael O. Ruggiero. *Manuscripta Mathematica* (2022)