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On the Lagrange and Markov Dynamical Spectrum for Surfaces of Negative Curvature

Let X be a complete vector field on the a surface M .

Given a continuous real function $f: M \rightarrow \mathbb{R}$, we define the Lagrange dynamical spectra associated to (f, X) by

$$L(f, X) = \left\{ \limsup_{t \rightarrow \infty} f(X^t(x)) : x \in M \right\},$$

and the Markov Dynamical spectra associated to (f, X) by

$$M(f, X) = \left\{ \sup_{t \in \mathbb{R}} f(X^t(x)) : x \in M \right\}.$$

In this lecture we show that for a typical non-compact surface of finite volume and negative curvature the Lagrange and Markov dynamical spectra associated to the geodesic flow have non-empty interior for a "large" set of the real functions on the the surface.