Universidade Estadual de Campinas

Workshop in Stochastic Analysis and Applications

- August, 2018 -

Paulo H. P. da Costa
UNB - Brazil
phcosta@unb.br

A strong averaging principle for Lévy diffusions in foliated spaces with unbounded leaves

Abstract

This work extends a strong averaging principle for Lévy diffusions which live on the leaves of a foliated manifold subject to small transversal Lévy type perturbation to the case of non-compact leaves. The main result states that the existence of p-th moments of the foliated Lévy diffusion for $p \geq 2$ and an ergodic convergence of its coefficients in Lp implies the strong Lp convergence of the fast perturbed motion on the time scale t/ϵ to the system driven by the averaged coefficients. In order to compensate the non-compactness of the leaves we use an estimate of the dynamical system for each of the increments of the canonical Marcus equation derived in da Costa and Hoegele (2017), the boundedness of the coefficients in Lp and a nonlinear Gronwall-Bihari type estimate. The price for the non-compactness are slower rates of convergence, given as p-dependent powers of ϵ strictly smaller than $1/4$.