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Some geometrical aspects of Young integral: decomposition of flows

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Abstract

In many kinds of dynamical systems, in order to obtain local or asymptotic parameters of the dynamics, one performs a befitting decomposition of the associated flow, depending on the geometrical or analytical context. For example, given a flow in a Riemannian manifolds, one can write this flow (up to some geometrical conditions) as a Markovian process in the group of isometries of the manifold composed with a process in the Lie group of diffeomorphisms which fix a point in the manifold, see [Liao]. Another interesting decomposition is related to a pair of complementary foliations in a manifold: a stochastic flow can be written as a Markovian process in the Lie group of diffeomorphisms which act on the leaves of one foliation with a process in the Lie group of diffeomorphisms which act on the leaves of the other foliation, see e.g. [Melo] and references therein. Throughout this talk, we are going to make this second example more precise in the context of low regularity: namely we explore the geometry of the Young integral in a manifold. Particularly, our decomposition is based on an Itô-Kunita-Ventzel formula for α-Holder paths proved by Castrequini and Catuogno in [RP].

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