

Workshop in Stochastic Analysis and Applications

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Geometric properties of disintegration of measures

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Abstract

Given a probability space (X, \mathcal{F}, μ) and a partition \mathcal{P} of X , a disintegration of μ with respect to \mathcal{P} is a family of probabilities $\{\mu_P : P \in \mathcal{P}\}$ such that each μ_P is supported in the respective element P of the partition so that it is possible to recover μ by integrating this family. In this talk, we will discuss this concept in connection with some geometric properties of probability spaces and in the perspective of an optimal transport problem. In particular, considering X and Y as locally compact separable metric spaces and a probability measure γ in $X \times Y$, we will define a map f that associates each x in X with a probability measure γ_x in Y obtained via a disintegration of γ . Using this object, we will study a relationship between the disintegration of measures and the absolute continuity of the elements of the family of conditional probabilities.