Geometry of Interest Rates

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The time evolution of the Term structure of Interest Rates can be described by solution processes of Stochastic Differential Equation taking values in the Hilbert space of forward rate curves. By methods from infinite dimensional Analysis and Geometry we characterize, whether such processes do remain in finite dimensional submanifolds of the Hilbert space or not. The relevant conditions are expressed in terms of involutive distributions on dense subsets of the given Hilbert space. We also consider the opposite phenomenon, i.e. when no locally invariant finite dimensional submanifolds do exist, by means of Malliavin Calculus. The precise meaning of both phenomena in Financial Mathematics is discussed.

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