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TIME DEPENDENT MALLIAVIN CALCULUS ON MANIFOLDS AND APPLICATION TO NONLINEAR FILTERING

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Abstract: In this paper, we prove, using Malliavin calculus, that under a global Hörmander condition the law of a Riemannian manifold valued stochastic process, a solution of a stochastic differential equation with time dependent coefficients, admits a $\mathcal{C}^\infty$-density with respect to the Riemannian volume element. This result is applied to a nonlinear filtering problem with time dependent coefficients on manifolds.

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