Coupling semimartingales in manifolds; some recent applications
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We report on recent work where parallel coupling of Brownian motions with drift is used to prove geometric inequalities on manifolds. We compare the densities of the joint law of hitting time and hitting position of the boundary of a relatively compact domain, by two Brownian motions started at different points inside the domain. We use it to obtain Harnack inequalities and estimates of the heat kernel in manifolds with curvature unbounded below.