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Pradip R Aryal* (pradip@nmsu.edu), Department of Mathematical Sciences, NMSU, Las Cruces, NM 88003. *A Study of Brownian Motion under Brachistochrone-type metrics.*

I will derive some expressions for the transition density of a Brownian motion in upper-half spaces under Brachistochrone-type metrics. In one regime, $0 < \alpha < 2$, these variable curvature metrics sit between Euclidean Brownian motion and hyperbolic Brownian motion. In this case the process has a killing time which can be expressed in terms of Bessel processes of negative dimension. In the other regime $2 < \alpha$, they behave as more extreme analogs of hyperbolic Brownian motion which never exit the domain. Keywords: Brownian motion, Bessel process and Brachistochrone-type. (Received February 08, 2014)