

ON GEODESIC EXPONENTIAL MAPS OF THE VIRASORO GROUP

THOMAS KAPPELER

JOINTLY WITH A. CONSTANTIN, B. KOLEV, AND P. TOPALOV

We study the geodesic exponential maps corresponding to Sobolev type right-invariant (weak) Riemannian metrics $g(k)$, ($k = 0, 1, \dots$), on the Virasoro group Vir and show that for $k = 2, 3, 4, \dots$, but not for $k = 0, 1$, each of them defines a smooth Frechet chart of the unital element in Vir . The geodesic exponential map for $k = 0$ corresponds to the KdV equation and hence is not a local diffeomorphism near the origin.