Uniqueness of the Fisher-Rao metric on the space of smooth positive densities

Peter Michor

Universitt Wien

Austria

e-mail: peter.michor@univie.ac.at

For a smooth compact manifold M, any weak Riemannian metric on the space of smooth positive densities which is invariant under the right action of the diffeomorphism group $Diff(M)$ is of the form

$$G_\mu(\alpha, \beta) = C_1(\mu(M)) \int_M \frac{\alpha}{\mu} \frac{\beta}{\mu} \mu + C_2(\mu(M)) \int_M \alpha \cdot \int_M \beta$$

for smooth functions C_1, C_2 of the total volume $\mu(M) = \int_M \mu$. For more details, see
http://arxiv.org/abs/1411.5577.

In this talk the result is extended to:

1. manifolds with boundary, possibly (there is still a gap) even for manifolds with corners and orbifolds

2. to tensor fields of the form $G_\mu(\alpha_1, \alpha_2, \ldots, \alpha_k)$ for any k which are invariant under $Diff(M)$.