1096-53-734 **Mario Micheli*** (mariomicheli@gmail.com), University of Washington, Department of Mathematics, C-434 Padelford Hall, Box 354350, Seattle, WA 98195. *A class of Riemannian metrics for shape deformation analysis.*

In recent years the rapid development of precise acquisition techniques for medical data has prompted applied mathematical work on the quantification of geometric deformation, for the ultimate purpose of performing statistics (e.g. template estimation, classification, regression analysis, and so on) on "shape spaces"; examples of shapes are curves in two or three dimensions, surfaces, images, tensor fields, or sets of feature points. In particular, the action of groups of diffeomorphisms induces Riemannian metrics on shape spaces; such approach is known as Large Deformation Diffeomorphic Metric Mapping (LDDMM). One may choose different metrics (inner products of vector fields) on the tangent space of the diffeomorphisms group, and these will induce different metrics and geometries on the shape spaces. In this talk we shall characterize the class of translation- and rotation-invariant metrics on group of diffeomorphisms, and provide examples of metrics whose geodesics in the group are generated by curl-free or divergence-free vector fields. The latter may prove especially useful in medical applications where deformations are known to preserve volume (for example, for deformations of the tissues of the heart). (Received September 09, 2013)