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Matching and density properties of infinitesimal isometries on 2d surfaces.

An infinitesimal isometry of order n of a given surface is a one parameter family of deformations u_t whose induced change of metric is of order t^{n+1} . Sobolev isometries and infinitesimal isometries arise in the study of nonlinear elasticity of thin plates and shells. An important property of these deformations in this context is their matching properties: Can an infinitesimal isometry of order n be modified in a controlled manner to yield one of order $m > n$? The answers much depend on the analytical and geometrical properties of the surface and the regularity of the given deformation and has consequences for the elastic properties of the surface. We will review some recent and past results and discuss some open problems. (Received June 27, 2011)