

Meeting: 1001, Evanston, Illinois, SS 10A, Special Session on Differential Geometry

1001-53-338 **Keith Burns*** (burns@math.northwestern.edu), Department of Mathematics, Northwestern University, Evanston, IL 60208, and **Vladimir Matveev**, Mathematisches Institut, Universitaet Freiburg. *Magnetic systems with the same geodesics.*

A classical topic in Riemannian geometry is the study of metrics that share the same geodesics (up to reparametrization). The talk will discuss the analogous problem for magnetic geodesics. These curves are determined by a magnetic system, which consists of a Riemannian metric and a closed 2-form (the magnetic field). We consider two magnetic systems which share the same magnetic geodesics and have the additional property (which is automatically satisfied in the classical geodesic situation) that all magnetic geodesics from a certain energy level in one system are reparametrizations of magnetic geodesics from a certain energy level in the other system. We show that this is possible only if the systems are rescalings of one another or both magnetic fields vanish and the two Riemannian metrics share the same geodesics. (Received August 30, 2004)