1135-53-520 **Patrick B. Eberlein*** (pbe@ad.unc.edu), University of North Carolina, Department of Mathematics, Chapel Hill, NC 27599. *Central conjugate locus of 2-step nilpotent Lie groups.*

Our goals are twofold : 1) to compute the conjugate locus of a geodesic that lies in the center of a simply connected, 2-step nilpotent Lie group N with a left invariant metric 2) compare the isometry types of two such nilpotent Lie groups N_1, N_2 whose conjugate loci for central geodesics are "the same" in a suitable sense. The first goal is achieved. The second goal is elusive, and we obtain a partial result.

Let Z be an element of the center of a 2-step nilpotent Lie algebra $\mathfrak{N}$ equipped with an arbitrary inner product $\langle , \rangle$. Let N be the simply connected Lie group with the left invariant metric determined by $\langle , \rangle$. Then $\gamma_Z(t) = exp(tZ)$ is a geodesic of N contained in the center of N, and all central geodesics of N starting at the identity arise in this fashion. The conjugate locus of γ_Z is computed explicitly from the eigenvalues of the self adjoint curvature operator $R_Z : \mathfrak{N} \to \mathfrak{N}$ given by $R_Z(X) = R(Z,X)Z$. Conversely, in "almost every" case the conjugate locus of γ_Z determines the eigenvalues of R_Z. (Received September 06, 2017)