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Allie Ray* (allie.ray@mavs.uta.edu). *The Geometry of Two-Step and Three-Step Nilpotent Lie Algebras and Nilmanifolds Constructed from Schreier Graphs.*

I will present necessary and sufficient conditions for extending a certain two-step nilpotent Lie algebra constructed from a colored, directed graph to a three-step nilpotent Lie algebra. The two-step construction is a generalization of a method used by S.G. Dani and M.G. Mainkar. Three-step nilpotent Lie algebras are more delicate to construct since the Jacobi equation becomes a consideration. In addition, starting with pairs of Schreier graphs of a Gassmann-Sunada triple, I will consider the geometry (in particular issues of isospectrality and isometry) of the associated nilmanifolds. (Received January 16, 2015)