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Danijela Damjanovic* (dani@rice.edu). *Global hypoellipticity of leafwise Laplacian and local rigidity of some parabolic homogeneous actions.*

Unlike the case of vector fields, global hypoellipticity of a system of two or more commuting vector fields is a very weak property. However, global hypoellipticity of the leafwise Laplacian is sufficient to imply finite dimensional first and second cohomology in general, and for particular actions on 2-step nilmanifolds even trivial first cohomology. For the examples on 2-step nilmanifolds this gives transversal local rigidity for these parabolic homogeneous actions. This is a natural extension of the classical KAM result of Arnold and Moser about perturbations of Diophantine vector fields on tori. (Received December 01, 2012)