

**Non-holonomic equations for sub-Riemannian  
extremals and metrizable parabolic geometries**

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I will report several recent attempts linking sub-Riemannian geometries to the rich geometry of filtered manifolds, particularly the parabolic ones. After touching on some relation between the canonical Cartan geometries, I shall present an approach to sub-Riemannian extremals motivated by the tractor calculus. Finally, I will explore some implications of the BGG machinery to the (sub-Riemannian) metrizability of parabolic geometries. All that will be based on joined work with D. Alekseevsky, A. Medvedev, R. Gover, D. Calderbank, V. Soucek.