Vakonomic mechanics on Lie affgebroids

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The geometry and dynamics on Lie algebroids have been extensively studied during the past years. From the Physics point of view, Lie algebroids can be used to give geometric descriptions of Lagrangian and Hamiltonian Mechanics (see [5, 6]). In the same direction, the cases of nonholonomic and vakonomic mechanics on Lie algebroids has been analized (see [1, 2]).

A possible generalization of the concept of a Lie algebroid to affine bundles is the notion of a Lie affgebroid. Lie affgebroid structures may be used to develop a time-dependent version of Lagrange and Hamilton equations on Lie algebroids (see [4, 7]). In the same setting of Lie affgebroids, we have developed a geometric description of Lagrangian systems subject to nonholonomic affine constraints (see [3]).

In this poster, we pretend to present a geometric description of vakonomic mechanics on Lie affgebroids. Moreover, we define the vakonomic aff-Poisson bracket associated with a regular vakonomic system on a Lie affgebroid which plays a prominent role in the description of the vakonomic dynamics.

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