

## Some Aspects Concerning the Dynamics Given by Pfaff Forms

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### Abstract

The aim of the paper is to extend Lagrangian dynamics to Pfaff form dynamics, where a Pfaff form is a differential form on a tangent bundle, non necessary closed. Considering the action of a Pfaff form on curves, given by a second order Lagrangian linear in accelerations, we obtain the equations of the first and second variations, using variational methods. In the non-singular case, considered mainly in the paper, the generalized Euler-Lagrange equation is a third order differential equation. As examples, we find that the solutions of the differential equations of motion of a charge in a field and the Euler equations for the rotational dynamics of a rigid body about its center of mass can be obtained as particular solutions of suitable Pfaff forms, with non-negative second variations.