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SEMINÁRIO DE GEOMETRIA

Dia 15 de Dezembro (sexta-feira), às 14H00, na sala 6.2.33

Discretization of Euler-Poincaré variational principles using reduced forward difference operators

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Abstract:

Euler-Poincaré equations on a principal G-bundle P are the expression in H-reduced coordinates of classical Euler-Lagrange equations associated to some Lagrangian density on the first jet extension of the bundle P->P/G (H subgroup of elements in G that act as symmetries of the lagrangian).

We explore the notion of reduced forward difference operator on any principal G-bundle. This element plays in discrete gauge field theories the same role as retraction mappings for a Lie group in the generation of variational integrators for geometric mechanics and control theory. A gauge-covariant choice of reduced forward difference operator will relate four different gauge-invariant variational principles, classified according to its smooth or discrete nature and its expression in terms of either a potential or reduced field.

(Joint work with A. C. Casimiro)

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