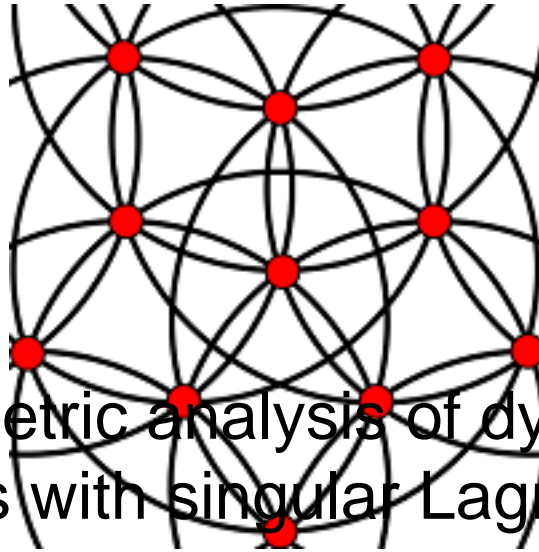


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A geometric analysis of dynamical systems with singular Lagrangians

Content :

The aim is to find a “dynamical picture”, i.e. geometric structure of the complete solution of equations of motion of a singular Lagrangian, and study symmetries of the corresponding implicit Euler-Lagrange equations.

In case of regular Lagrangians the dynamics are completely described by a one-dimensional foliation of the phase space. For singular Lagrangians the structure of solutions is much more complicated, and to find it one has to apply the so-called geometric constraint algorithm which provides a system of final constraint submanifolds. This method is a mathematically correct setting for the heuristic Dirac algorithm.

Contrary to the geometric approach the Dirac algorithm often provides incomplete or confusing results. Our aim is to analyze completely the dynamics and find all symmetries of a concrete singular Lagrangian system by the geometric approach.

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