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On Lie Groupoids, Lie Algebroids and Equations of Motion under Mutual Actions

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Abstract

In this work, we present matching of two mutually interacting Lagrangian systems on Lie algebroid frameworks. Firstly, we mention Lie groupoids and Lie algebroids formally. Due to the mutual actions of two Lie groupoids and two Lie algebroids onto each other, we refer the matched Lie groupoids and Lie algebroids structures. Then, we obtain Euler-Lagrange equations on the matched Lie algebroids which involve individual behaviours and mutual action terms. During this work, we provide many examples.

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