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Abstract

We propose a new form of Lagrangian that shows branching for the associated Hamiltonian
and has relevance to the quadratic type and mixed linear-quadratic Liénard-type nonlinear
dynamical equations on adjusting the underlying parameters. Non-uniqueness of the
Lagrangian is pointed out and a particular one when Fourier transform is demonstrated to
depict a momentum-dependent quantum-like mass system when expanded binomially.

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