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*The intrinsic linearization of equilibria of nonholonomic systems*

For Hamiltonian systems, linearizations at an equilibrium are themselves Hamiltonian, and their spectrum is invariant under negation. By consequence, structurally either a Hamiltonian system departs an equilibrium or delicately oscillates about it with purely imaginary spectrum; asymptotic stability is precluded.

These structural restrictions do not persist to nonholonomic systems, such as are used to model rigid no-slip rolling. Yet, by following the underlying semi-symplectic geometry of nonholonomic systems to the linearized level (this geometry is universal for nonholonomic systems), one can derive the structure of the linearizations of their equilibria, and show for example that the linearization of the ground state of any nonholonomic system is fact naturally Hamiltonian.