

Periodic orbits of magnetic flows on the 2-sphere

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In this talk, I will consider magnetic Tonelli Hamiltonian systems on the cotangent bundle of the 2-sphere, where the magnetic form is not necessarily exact. It is known that, on very low and on high energy levels, these systems may have only finitely many periodic orbits. I will show that on almost all energy levels in a precisely characterized intermediate range there are infinitely many periodic orbits. Such a range of energies is non-empty, for instance, in the physically relevant case where the Tonelli Lagrangian is a kinetic energy and the magnetic form is oscillating.