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Stability of minimizing solutions in the N -body problem

We study subsystems of the N -body problem, constructing minimizing noncollision periodic orbits using a symmetric variational method with a finite order symmetry group. The solution of the variational problem gives existence of periodic orbits which realize certain symbolic sequences of rotations and oscillations for any choice of the mass ratio.

The Maslov index of the periodic orbits is then investigated and used to prove the main result which states that the minimizing curves in the three dimensional reduced energy momentum surface are naturally extended to periodic integral curves which are generically hyperbolic.