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Linear Stability of Some Symmetric Periodic Simultaneous Binary Collision Orbits in the Four-Body Problem

Recently, Roberts developed a method for analyzing the linear stability of time-reversible periodic solutions of a Hamiltonian system. He used this method to determine the linear stability of the figure eight orbit in the equal mass three-body problem. We use Robert's method to determine the linear stability of time-reversible periodic simultaneous binary collision orbits in the symmetric collinear four-body $1, m, m, 1$ problem, and in the two-dimensional symmetric equal mass four-body problem.