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Orbital Eccentricity and the Stability of Planets in the Alpha Centauri System

Planets on initially circular orbits are typically more dynamically stable than planets initially having nonzero eccentricities. However, the presence of a major perturber that forces periodic oscillations of planetary eccentricity can alter this situation. We investigate the dependance of system lifetime on initial eccentricity for planets orbiting one star within the alpha Centauri system. Our results show that initial conditions chosen to minimize free eccentricity can substantially increase stability compared to planets on circular orbits.