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Precession of nearly circular orbits in the Newtonian 2-body problem perturbed by constant positive curvature DANIEL E. SHAI, JOHN F. LINDNER, Physics Department, The College of Wooster, Wooster OH 44691 — We generalize the reduced Newtonian 2-body problem by embedding it in a space of constant positive curvature. Using perturbation theory, we demonstrate analytically that a nearly circular orbit will precess with a frequency proportional to the square root of its size. Using computer simulation, we confirm this behavior numerically by directly integrating the equations of motion. This work is part of a larger study of the nonlinear dynamics of the 2-body problem in a spherical universe and was supported by NSF Grant No. DMR-0243811 and The College of Wooster.

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