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A Practical Method for Extraction of Orbital Energy MATTHEW PROCTOR, Chabot College/UC Berkeley, KEVIN JI, George Washington University, ERIK GILSON, Princeton Plasma Physics Laboratory, ERIC BLACKMAN, University of Rochester, HANTAO JI, Princeton Plasma Physics Laboratory — Approximately 5000 manmade satellites are in orbit around the Earth as of today, about 1900 of which are still operational. The orbits of these satellites about the Earth can be altered, and even brought to ground via technology that extracts gravitational potential energy and stores that energy in a capacitor. Analysis of the orbits of coupled masses in the presence of a large central body suggest the potential to recover energy from the orbits of these bodies. By absorbing energy from the epicyclic orbits of these bodies, the entire system gradually falls toward the central body, while the lost energy is gained in the form of electricity, allowing the operator(s) of the satellite to recover some of the initial investment of putting the satellite into orbit. Creating a numerical simulation for this process that accounts for the dynamical interactions in the system allows for many configurations to be tested in search for the ideal energy extraction method, and facilitates an improved understanding of the basic principles involved.

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