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John B Little* (little@mathcs.holycross.edu), Department of Mathematics and Computer Science, College of the Holy Cross, Worcester, MA 01610. *Continua of central configurations with a negative mass in the n -body problem.*

A configuration of bodies in the Newtonian n -body problem is said to be a central configuration if the acceleration vector of each body is directed toward the center of mass of the configuration and the proportionality factors between the accelerations and the displacements from the center of mass are all equal. Two central configurations are equivalent if some composition of a rigid motion and scaling maps one to the other. One of the main open questions about central configurations is: Given a set of (positive) masses, is the set of equivalence classes of central configurations finite, or can there be a positive-dimensional family for some collection of masses? For $n = 3$ and 4, it is known that the set of equivalence classes is finite for all collections of positive masses. However, Gareth Roberts produced a 5-body example in the plane, containing one negative mass, where the set of equivalence classes of central configurations is a curve ("a continuum"). In this talk, we will present a construction that generalizes Roberts' example to produce similar continua of central configurations with one negative mass in all even dimensions greater than or equal to 4. The construction relies mainly on properties of regular polyhedra and their symmetry groups. (Received September 22, 2012)