

Abstract Submitted
for the APR06 Meeting of
The American Physical Society

Further Investigations Into the Formation Mechanisms for Kuiper Belt Binaries RAY NAZZARIO, TRUELL HYDE, CASPER - Baylor University — Recent observations and theoretical studies show that multiple-member groupings of Kuiper Belt objects exist. Although their creation presents problems in current models, the inclusion of a massive third body (ex. one of the outer planets or a forming protoplanet) often provides the necessary conditions for the formation of such objects. The presence of a perturbing body can also provide clearing of the primordial Kuiper Belt while producing more stable, longer-lived multiple-member groupings of Kuiper belt objects. In this work, a fifth order Runge-Kutta algorithm is employed to numerically examine the situation described. It is shown that the interparticle gravitational interaction creates one of several effects; scattering into the Oort cloud, collisions with nearby growing protoplanets, formation of up to quaternary systems of Kuiper Belt objects, or creation of a single Kuiper belt object. Additionally, it is seen that the initial location of the precursors of the Kuiper belt objects can also have a significant effect on binary formation with objects near resonances tending not to form mutli-member groupings.

Truell Hyde
CASPER - Baylor University

Date submitted: 14 Jan 2006

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