

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

A Plasma Tweezer Concept to De-spin an Asteroid KEON VEREEN, IMAN DATTA, SETTHIVOINE YOU, University of Washington — The Plasma Tweezer is a new concept for controlled de-spinning and deflection of space bodies without mechanical contact. The method shoots plasma jets or beams at the target from a pair of plasma thrusters located at the end of each lever arm of a “tweezer” structure. The main spacecraft body is at the fulcrum point of the tweezer and the target is located between the thrusters. This arrangement cancels out the impulse of two plasma jets on the spacecraft and applies forces on opposite sides of the target. Careful timing and orientation of the jets can then provide the necessary forces to despin and redirect the target. This concept is more efficient than the Ion Beam Shepherd method [Bombardelli C, Pelaez J, “Ion Beam Shepherd for Asteroid Deflection,” J. Guid. Control Dyn. (2011)] because it does not require a secondary thruster to cancel momentum and can benefit from angular momentum stored in the spacecraft’s initial spin stabilization.

Keon Vereen
University of Washington

Date submitted: 11 Jul 2014

Electronic form version 1.4