

Abstract Submitted
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Ion friction at small values of the Coulomb logarithm¹ ROBERT SPRENKLE, SCOTT BERGESON, Brigham Young University — We report relaxation measurements in a Ca^+/Yb^+ dual species ultracold neutral plasma. The nearly 4:1 mass ratio of the ion species in our plasma is similar to the alpha:proton mass ratio important for fusion-class systems. Our system provides a platform for using Ca^+ and Yb^+ ions to find the Coulomb logarithm for momentum transfer collisions in a strongly coupled plasma environment. The velocity distributions are determined using laser-induced fluorescence. Measurements are compared to a two-fluid code calculation that include convection, adiabatic expansion, pressure acceleration, ion friction, ambipolar field acceleration, and Joule heating to describe dual species plasma expansion. We compare our measurements with a range of expressions for the Coulomb logarithm from the literature.

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Robert Sprenkle
Brigham Young University

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