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Ion friction at small values of the Coulomb logarithm[1] ROBERT SPRENKLE, SCOTT BERGESON, Brigham Young University — We report velocity relaxation measurements in a Yb^+/Ca^+ 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 test expressions for the Coulomb logarithm used in momentum transfer collisions in a strongly coupled plasma environment. The spatial profiles and 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. We compare our measurements with simulations using expressions for the Coulomb logarithm from the literature.

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