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A Cold Atom Measurement of Charge Exchange Collisions between Trapped Yb^+ and Yb[1] ANDREW GRIER, MARKO CETINA, FEDJA ORUCEVIC, VLADAN VULETIC, MIT Center for Ultracold Atoms — We measure the collisional cross-section and rate constant of the ^{174}Yb and $^{172}Yb^+$ charge-transfer process. The neutral atoms are trapped in a magneto-optical trap (MOT) resonant with their 399 nm, $^1S_0 \rightarrow {}^1P_1$ transition and are near the Doppler-limited temperature of 680 μK. The ions are confined in a planar Paul trap with a secular frequency of 39 kHz, Doppler cooled, and spatially overlapped with the neutral atoms. The collisional energy is varied from 4 meV to 100s of neV by varying the micromotion energy of the ions by displacement from the center of the Paul trap. We report the rate constant in comparison to that derived from the Langevin cross-section.

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