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Ion-ion correlation impacts on electron-ion collision rates in plasmas[1] JOHN GUTHRIE, WEI-TING CHEN, PUCHANG JIANG, CRAIG WITTE, JACOB ROBERTS, Colorado State University — Ultracold plasmas can be created at sufficiently cold temperatures that spatial correlations in the electron and ion components can become significant with respect to many plasma properties in the so-called strong coupling regime. In recent experimental work, we measured a discrepancy between predicted and measured electron-ion collision rates. Subsequent simulations of this experimental measurement have indicated that ion-ion correlations need to be taken into account in computing the electron-ion collision rate. This is despite the fact that there is a mass ratio of approximately 10^5 between the ion and electron masses in the ultracold plasma. We discuss the significance of these results in the context of both ultracold plasmas and other plasmas in general.

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Jacob Roberts
Colorado State University

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