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**Ion-dust streaming instability in microgravity dusty plasma**[1] EVDOKIYA KOSTADINOVA, MARTIN LECHUGA, Baylor University, JOSHUA PADGETT, Texas Tech University, CONSTANZE LIAW, University of Delaware, PETER HARTMANN, Wigner Research Centre for Physics, LORIN MATTHEWS, TRUELL HYDE, Baylor University — Streaming instabilities are a likely mechanism for planetesimal formation in protoplanetary disks. Due to the presence of charged dust particles in dense interstellar and circumstellar environments, charging processes are likely to affect the onset of such instabilities. Here we investigate ion-dust streaming instabilities in microgravity dusty plasmas using data from the Plasma Kristall-4 facility on board the International Space Station. Specifically, we examine how dust charging and ion wakefield formation affect the onset of the streaming instability and identify the parameter space where these instabilities are most likely to occur. The analysis reveals that above a critical dust particle concentration, the onset of ion-dust streaming instability is highly sensitive to variations in plasma density and gas pressure, which makes it a useful indicator of (controlled or unexpected) changes in the system conditions.

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