Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Overcoming Rayleigh-Plateau instabilities in liquid metal streams via electrochemical oxidation KAREN DANIELS, MINYUNG SONG, KEITH HILLAIRE, MICHAEL DICKEY, North Carolina State University — Liquid streams emerging from a nozzle break up rapidly into droplets due to Rayleigh-Plateau instabilities driven by surface tension. We find that a room-temperature liquid metal, eutectic gallium indium, can be formed into stable cylindrical streams by applying an oxidizing potential to a slowly-injected, high-surface-tension metal. We observe a range of morphologies, including droplets, fine (100-μm diameter) wires, and irregular shapes. The wire-like streams are stable enough to flow and bend around obstacles, suggesting their utility as means of producing and controlling metallic structures at room temperature.

Karen Daniels
North Carolina State University

Date submitted: 03 Aug 2020 Electronic form version 1.4