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Characterization of a metal vapor arc discharge¹ MATTHEW BLEDSOE, Princeton Plasma Physics Laboratory, JACOB SIMMONDS, Princeton University, YEVGENY RAITSES, Princeton Plasma Physics Laboratory — Arc discharges are used in many applications including welding, lighting, and the deposition of metal films. In this work, we characterize the initiation and operation of an arc discharge between a hollow cathode and an anode plate in a metal vapor environment and compare it to an arc discharge with the same setup in an argon environment. The discharges are operated at sub-Torr pressure. The hollow cathode contains an independently heated tungsten filament that acts as an initial source of electrons to aid in discharge initiation without requiring initial physical contact between the electrodes. The interaction between the arc plasma and the molten metal cathode is analyzed and discussed in this work.

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