Abstract Submitted
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Thermal mapping of Hollow Cathodes to model the thermal loads of Iodine Ion Propulsion[1] PAUL WINNER, Embry-Riddle Aeronautical University, Daytona Beach, DR. RICHARD BRANAM COLLABORATION, KIRK BOEHM COLLABORATION — Iodine possesses desirable qualities that could make it a potential fuel of choice in future space missions requiring ion propulsion, potentially replacing Xenon; if the thruster can have similar endurance despite Iodine's corrosiveness. A computer-aided design model of a hollow cathode with a Lanthanum Hexaboride insert was created in Solidworks, using its thermal load simulator to generate an approximate temperature model of it in operation. Data was then collected to refine the model by getting temperature readings of a hollow cathode in operation by attaching type K thermocouples to the outside and inside of the hollow cathode and firing it in a vacuum chamber. Differences between the thermal model and the experimental data will be discussed in addition to the assumptions made within the thermal model. Based on the data, the hollow cathode is far below expected temperatures, though there are several sources of error to explain this discrepancy.

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