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Testing Iodine as a New Fuel for Cathodes[1] HARLEY GLAD, Southern Utah University, RICHARD BRANAM, JIM ROGERS, MATTHEW WARREN, CONNOR BURLESON, GRACE SIY, The University of Alabama — The objective of this research is to demonstrate the viability of using iodine as an alternative space propulsion propellant. The demonstration requires the testing of a cathode with xenon and then the desired element iodine. Currently, cathodes run on noble gases such as xenon which must be stored in high pressure canisters and is very expensive. These shortcomings have led to researching possible substitutes. Iodine was decided as a suitable candidate because it's cheaper, can be stored as a solid, and has similar mass properties as xenon. In this research, cathodes will be placed in a vacuum chamber and operated on both gases to observe their performance, allowing us to gain a better understanding of iodine's behavior. Several planned projects depend on the knowledge gained from this project, such as larger scaled tests and iodine fed hall thrusters. The tasks of this project included protecting the stainless-steel vacuum chamber by gold plating and Teflon®coating, building a stand to hold the cathode, creating an anode resistant to iodine, and testing the cathode once setup was complete. The successful operation of the cathode was demonstrated. However, the experimental setup proved ineffective at controlling the iodine flow. Current efforts are focused on this problem.

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Amy Lang
University of Alabama

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