

Czech Technical University
Faculty of Electrical Engineering
Department of Control Engineering

**CTU Diploma Project review- 2nd reviewer's evaluation of master thesis with title
" The I2T5: Enhancement of the Thermal Design of an Iodine Cold Gas Thruster " by Space
Master student Roger Pereira**

I find that the goal of the thesis project fulfills the requirements of a master thesis in space technology. The thesis concerns re-design of a an Ionide Cold Gas Thruster to decrease the heat-loss due to conductive thermal contact between the tank and the thruster, which was discovered during the first flight.

In chapter 2 the author gives a background to the different heat transfer mechanisms and their couplings. Thermal modeling (thermal circuits) are presented. The thermal environment of the space, making up the radiative case is also presented. The background part is well written and easy to read, and gives the relevant information for the following chapters

In the first part of chapter 3, the author describes the suggested improvements (material, configuration and geometry) and the simulation results. In this part a weakness is that the geometry change is not clearly motivated. Why this shape? Why this size?

In chapter 3.4 a test setup in vacuum chamber is presented, and then compared to the test of the base set up, performed earlier, by the company. The main weakness of the thesis is the analysis and discussion regarding the test result and the differences between the two. Chapter 3.5 presents simulations including the space thermal environment. The thesis would have benefited from a more extensive discussion regarding the results.

Summary:

The student has put in a sufficient effort into the task.

The result of the thesis project may contribute to a future solution to the problem addressed. More tests should have been performed, and compared to simulations, but this was out of control for the student, due to limited access to the facilities.

Based on the review above I recommend to grade the thesis by B. The oral presentation is still to be graded.

This review serves solely for the purposes of the diploma project defense at CTU. LTU official evaluation for the SpaceMaster double degree will follow the thesis defense and may differ from this review report and suggested grade.

Kiruna, September 25 2020

Dr. Anita Enmark
Luleå University of Technology