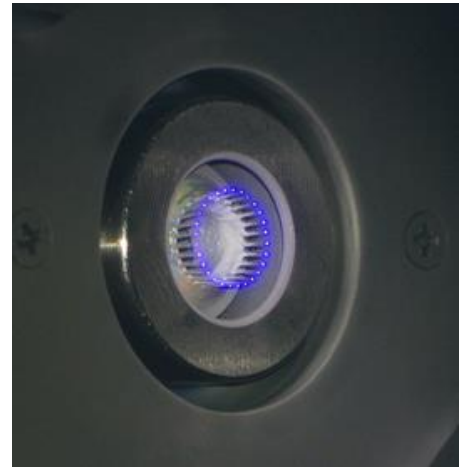


ENPULSION FEEP WORKSHOP

The ENPULSION FEEP workshop is conducted with an engineering unit of an ENPULSION NANO placed in a **small sized vacuum chamber**. This setup allows **flexibility** by operating the thruster both using the ENPULSION EGSE GUI as well as **operating the thruster using customer-furnished equipment including OBC and EDU** that can be placed tabletop in air next to the vacuum chamber for maximum flexibility. The workshop is complemented by an in-depth discussion of the manual, fostering understanding of the operational logic and constraints to facilitate customer-side implementation of the manual scripts. In addition, FEEP experts are available to **jointly define individual commissioning strategy based on specific mission needs and on-orbit capability**. This workshop has been proven as an effective tool to decrease required time for on-orbit commissioning, both by **verification of command scripts and hardware on an operational FEEP thruster**, and by definition of individual commissioning strategies including defined data review points.



Constraints of operation:

The operation in a small vacuum chamber **limits operation to thrust and power level (up to 100 μ N)**. Higher power levels would require different vacuum chamber facilities with according impact on scheduling and cost and can be discussed individually.

3 DAY WORKSHOP AGENDA

FEEP THEORY AND MANUAL	Introduction to FEEP physics and manual theory. Detailed discussion on ion emission, neutralization strategy, and how these are reflected in the operational scripts in the manual. Understanding the script logic allows the customer to tailor scripts to their specific operation needs.	Day 1 morning
THRUSTER OPERATION USING ENPULSION GUI	Using the ENPULSION GUI allows direct and simple control of the thruster in the vacuum chamber, allowing to familiarize the user with operation of the FEEP thruster, providing understanding of the thruster feedback to commands sent.	Day 1 afternoon
OPERATION ON NANO WITH CUSTOMER-FURNISHED EQUIPMENT	This section allows the customer to perform coupling tests of his equipment with the NANO thruster including thrust generation. This can include verification of customer-written commissioning and operation scripts on a thruster providing real feedback (at reduced thrust and power setpoints). This has been proven as an efficient way to de-risk and streamline in-orbit commissioning and operation.	Day 2 all day & Day 3 morning
CUSTOMIZATION OF COMMISSIONING STRATEGY	Tailoring of the commissioning strategy to the mission needs and onboard capability, identifying streamlined commissioning sequence and data review strategy. This has been proven as a valuable tool to reduce overall commissioning time as well as increase thruster availability by individually tailoring FDIR responses based on spacecraft capabilities.	Day 3 afternoon

The proposed agenda can be adapted to specific customer needs which can be discussed individually.