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Many kinds of plasma oscillations have been known to exist in Hall thrusters.¹⁴ Since the 1960 ' s, numerous studies have been performed to characterize these oscillations.¹⁵⁻²⁹ In the current generation of Hall thrusters, there are three oscillation modes that dominate the oscillation spectra, the breathing mode, the spokes mode, and the cathode gradient-driven mode.

Plasma Oscillation Characterization of NASA ' s HERMeS Hall ...

Non-emissive electrodes and ceramic spacers placed along the Hall thruster channel are shown to affect the plasma potential distribution and the thruster operation. These effects are associated with physical properties of the electrode material and depend on the electrode configuration and geometry and the magnetic field distribution.

Plasma characterization of hall thruster with active and ...

The plasma in the Hall thruster possesses Rayleigh-Taylor instability, resistive instability, transit time instability, electromagnetic instability and sheath instabilities [5, 6, 7, 8, 9, 10, 11]. These systems are rampant with plasma instabilities and fluctuations, many of which are responsible for performance, driving electron transport across magnetic field lines and

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contributing to propellant ionization.

Hall Thruster: An Electric Propulsion through Plasmas ...

Characterization of Hall Effect Thruster Plasma Oscillations based on the Hilbert-Huang Transform IEPC-2005-46 Presented at the 29 th International Electric Propulsion Conference, Princeton University October 31 November 4, 2005

CHARACTERIZATION OF HALL EFFECT THRUSTER PLASMA ...

Hall Thruster Discharge Chamber Plasma Characterization. Using a High-Speed Axial Reciprocating Electrostatic Probe. James M. Haas § , Richard R. Hofer ' and Alec D. Gallimore. Plasmadynamics and Electric Propulsion Laboratory. Department of Aerospace Engineering.

Hall Thruster discharge chamber plasma characterization ...

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Plasma Characterization Of Hall Thruster With Active And ...

Low-Power Operation and Plasma Characterization of a Qualification Model SPT -140 Hall Thruster for NASA Science Missions Charles E. Garner¹, Benjamin A. Jorns², Steven van Derventer,³ and Richard R. Hofer⁴ Jet Propulsion laboratory, California Institute of Technology, Pasadena, CA 91109 Ryan Rickard⁵, Raymond Liang⁶ and Jorge Delgado⁷

Low-Power Operation and Plasma Characterization of a ...

the 6-kW Hall thruster. This probe was selected due to its simplicity and ability to measure several plasma properties such as number density, electron temperature, floating and plasma potentials, and EEDFs. However, the analysis of Langmuir probe data in order to obtain these properties can be complex due to various effects causing

Near-Wall Plasma Characterization of a 6-kW Hall Thruster

In spacecraft propulsion, a Hall-effect thruster is a type of ion thruster in which the propellant is accelerated by an electric field. Hall-effect thrusters use a magnetic field to limit the electrons' axial motion and then use them to ionize propellant, efficiently accelerate the ions to produce thrust, and neutralize the ions in the plume. Hall-effect thrusters are sometimes referred to as Hall thrusters or Hall-current thrusters. The Hall-effect thruster is classed as a moderate specific imp

Hall-effect thruster - Wikipedia

Experimental and Theoretical Characterization of a Hall Thruster Plume by Yassir Azziz S.B., Aeronautics and Astronautics, Massachusetts Institute of Technology, 2001 ... of a Hall thruster from laboratory measurements and characterizes the plasma properties of the in-orbit plume.

Experimental and Theoretical Characterization of a Hall ...

Plasma Characterization of Hall Thruster with Active and Passive Segmented Electrodes Y. Raitzes, D. Staack and N. J. Fisch Princeton Plasma Physics Laboratory, Princeton, NJ 08540 Abstract voltage to the positive side electrode, the possibility of a two Non-emissive electrodes and ceramic spacers placed along the Hall thruster channel are shown

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OSTI.GOV Technical Report: Plasma Characterization of Hall Thruster with Active and Passive Segmented Electrodes

Plasma Characterization of Hall Thruster with Active and ...

characterization of far-field plume plasma is essential to comprehensively understand the ion dynamics properties, and construct a complete picture of plume plasma within a medium power Hall thruster. Moreover, the measurement results can provide data for the validation of numerical simulation

The far-field plasma characterization in a 600 W Hall ...

Plasma potentials and electron temperatures were deduced from emissive and cold floating probe measurements in a 2 kW Hall thruster, operated in the discharge voltage range of 200–400 V.

(PDF) Characterization of plasma in a Hall thruster ...

Non-intrusive characterization of the singly ionized xenon velocity in Hall thruster plume using laser induced fluorescence (LIF) is critical for constructing a complete picture of plume plasma, deeply understanding the ion dynamics in the plume, and providing validation data for numerical simulation.

The far-field plasma characterization in a 600 W Hall ...

Potential drop in the 100 W cylindrical Hall thruster is localized mainly in the cylindrical part of the channel and in the plume, which suggests that the thruster should suffer lower erosion of the channel walls due to fast ion bombardment. Plasma density has a maximum of about $(2.6 \text{ } 3.8) \times 10^{12} \text{ cm}^{-3}$ at the thruster axis. At the discharge voltage of 300 V, the maximum electron temperature is about 21 eV, which is not enough to produce multiple ionization in the accelerated flux of Xe⁺ ions [3].

Characterization of Plasma in a Miniaturized Cylindrical ...

Performance characterization of a low-power magnetically shielded Hall thruster with an internally-mounted hollow cathode 21 October 2019 | Plasma Sources Science and Technology, Vol. 28, No. 10 Evidence of Counter-Streaming Ions near the Inner Pole of the HERMeS Hall Thruster

Plasma Oscillation Characterization of NASA ' s HERMeS Hall ...

A Hall thruster uses ionized xenon as a propellant for space propulsion applications. The heat produced by thruster components and the xenon plasma transfers to space and the spacecraft, impacting thruster and spacecraft design, as well as thruster efficiency and lifetime.

Characterization of a Hall Effect Thruster Using Thermal ...

During the development phase, the laboratory-model NASA 173M Hall thrusters were designed and their performance and plasma characteristics were evaluated. Experiments with the NASA-173M version 1 (v1) validated the plasma lens magnetic field design.