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Microwave transmission measurements at the VENUS ECR ion source

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The VENUS electron cyclotron resonance (ECR) ion source uses injected 18 and 28 GHz microwave power to resonantly energize electrons for plasma ionization. Waveguide antennas detecting 18 and 28 GHz microwaves located after the extraction electrode exit aperture of the source are used to measure the transmitted microwave power under different source and plasma conditions. In addition, an antenna is placed in the 28 GHz waveguide to measure 18 GHz microwaves that make it back out, during 18 GHz only operation. The relationship between the transmitted and reflected power is investigated. Measuring the transmitted power can aid in understanding how to efficiently couple the microwaves to the plasma so as to achieve the maximum source output. The transmitted power, which is inversely related to the absorbed power, is dependent on the neutral gas pressure, and the minimum magnetic field B_{\min} . The production of $^{16}\text{O}^{6+}$ is also compared with the transmitted power.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Primary author: BENITEZ, Janilee (Lawrence Berkeley National Laboratory)

Co-authors: TODD, Damon (Lawrence Berkeley National Laboratory); HOLTER, Sage (Lawrence Berkeley National Laboratory)

Presenter: BENITEZ, Janilee (Lawrence Berkeley National Laboratory)

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