

Controlled axial density gradient formation for studies of modified, driven electromagnetic fluctuations in ALEXIS

EPS Plasma Physics

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Project Motivation

- The motivation for this project is to study the propagation of EMIC waves in a plasma with an axial density gradient
- This has applications in space physics research

This can be split into two major research questions:

Can ALEXIS be configured to produce plasma with axial gradients?

- Bias a cylindrical electrode to try and produce an axial gradient in electron density in ALEXIS

Confirm with:

1. Image analysis
2. Probe measurements
3. Spectroscopy

Can we launch EM waves with an antenna, and detect those waves with diagnostics throughout ALEXIS?

- Use the loop antenna to generate an oscillating magnetic field to drive EM waves
- Use various diagnostics to measure the propagation of these waves

Confirm with:

1. B-dot probe measurements
2. High-speed camera analysis

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Presentation today will focus on this topic

