Characterization of electrostatic turbulence in the MST reversed field pinch

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Abstract

In MST, power is deposited via tearing modes at low frequencies and waves at the electrons' gyrofrequency. The local density used here was determined using a triple probe, and is estimated to be ~1.2e12 cm⁻³. The local density was used in the MST reversed field pinch. The power contained in the floating potential and Vf are plotted in the MST reversed field pinch. The phases between the density fluctuations and Vf is shown here. The phases between the density fluctuations and the floating potential are shown in the MST reversed field pinch.

Motivations

- Turbulent transport is believed to be the primary mechanism by which plasma is lost from a tokamak.
- Many theoretical models exist that describe turbulence for different situations.
- Turbulence is present both in laboratory experiments and space physics.

Turbulence characteristics

- In MST, power is deposited via tearing modes at low frequencies and waves at the electrons' gyrofrequency.
- The phases between the density fluctuations and Vf is shown here.
- The phases between the density fluctuations and the floating potential are shown in the MST reversed field pinch.

Previous B-field results

- Theoretical predictions for the poloidal magnetic field pattern vary based on the type of interactions that are present.

Electrostatic Transport Probe

- Analysis techniques

Energy partition

- The phases between the density fluctuations and Vf are shown in the MST reversed field pinch.
- The phases between the density fluctuations and the floating potential are shown in the MST reversed field pinch.

Conclusions

- The phases between the density fluctuations and Vf are shown in the MST reversed field pinch.
- The phases between the density fluctuations and the floating potential are shown in the MST reversed field pinch.

References

- Howes et al. (2008)
- Biskamp et al. (1999)
- Galtier et al. (2000)
- Depositions (Saur et al., Astro. & Astrophy. 2002)
- Log-log

Analysis

- The phases between the density fluctuations and Vf are shown in the MST reversed field pinch.
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Energy partition

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