Obseravation a coherent Drift-Rotational modes with Strong Driven Rotation on the Large Plasma Device

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The instabilities observed on the Large Plasma Device (LAPD) [W. Gekelman, *et. al*, Rev. Sci. Instr. **62**, 2875 (1991)] are explored in conjunction with a the ability to finely adjust azimuthal flow and flow shear.

I. INTRODUCTION

II. OBSERVATION OF COHERENT MODES

Flucutation data from a recently conducted study of finely controlled azimuthal rotation on the LAPD[8] shows the emergence of a coherent mode with increasing limiter bias and thus azimuthal flow.

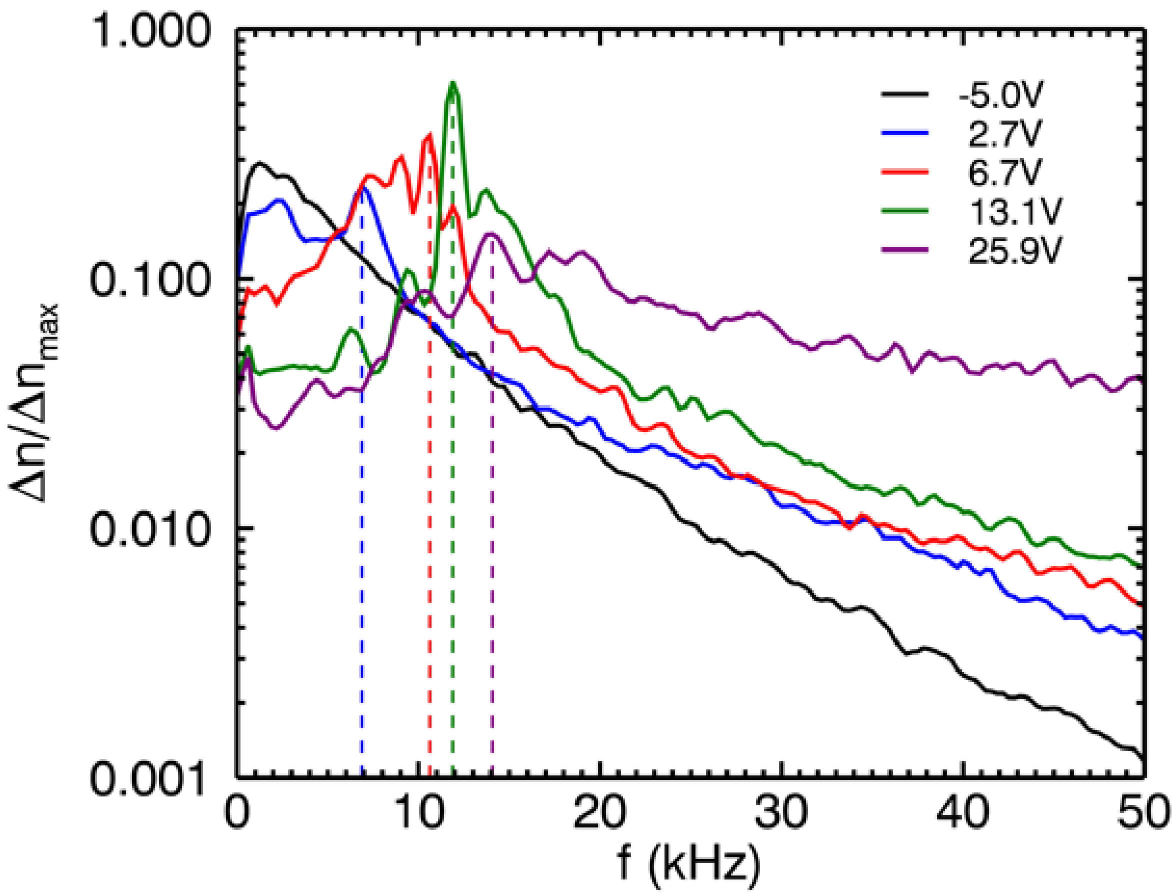

FIG. 1. Coherent modes for various biases

Figure 1 shows the frequency spectra for various biases for frequencies up to 50kHz and focused in the region right around the limiter edge, where the presense of the coherent mode is strongest. Compared to the minimum flow case (Limiter-Anode = -5.0V), where the fluctuation spectrum is broadband, a clear peaks in the spectra emerge starting at a Limiter-Anode voltage difference of 2.7V and increasing in power and frequency up to a voltage difference of 13.1V. The highest bias listed, with a voltage difference of 25.9V, shows a reduction in power and less distinct peaks.

III. CONCLUSIONS

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