

Abstract Submitted
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Intensity Threshold Circuit for Cavity Ring Down Spectroscopy Diagnostic JUSTIN ELLIS, JERRY CARR, SAIKAT THAKUR, ROBERT HARDIN, EARL SCIME, West Virginia University — The WVU Helicon Source group is constructing a Cavity Ring Down Spectroscopy (CRDS) system that will provide a new approach to measuring the ion velocity distribution function (ivdf) of an expanding helicon plasma source. The design is based on published CRDS design criteria [*Crunaire et al.*, Appl. Phys. B **85**, 467 (2006)]. Essentially, an acousto-optic modulator (AOM) splits a 668.43 nm laser beam into a zero and first order deflected beam. This first order beam is injected into the cavity, whose length is adjusted with a piezoelectric transducer to match the cavity resonance to the laser frequency. As the light intensity in the cavity reaches a predefined limit, a threshold circuit will send a signal to the AOM to turn off the first order beam. Measurements of the intensity decay time can then be obtained with a photodetector. The complete design of a threshold/trigger apparatus and corresponding electronics will be presented as well as a custom optical scheme for use on the Compact Helicon Waves and Instabilities Experiment (CHEWIE).

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