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A 300 GHz Collective Scattering System for Low Temperature Plasmas ROBERT HARDIN, West Virginia University, JOHN HEARD, Clarion University of Pennsylvania, EARL SCIME, MIKE SPENCER, RYAN MURPHY, ZANE HARVEY, West Virginia University — A compact, portable 300 GHz homodyne collective scattering system is being installed on the WVU helicon plasma source. Collective scattering is a non-perturbative method capable of directly measuring the short wavelength, high frequency, fluctuations in plasmas. The initial focus of the experiments at WVU will be to measure the so called “Trivelpiece-Gould” wave, or slow wave, which is believed to be responsible for the high RF absorption efficiency of helicon sources. The system, once primary testing and initial experiments are complete, will be transported to the Reconnection Scaling Experiment (RSX) at Los Alamos National Laboratory (LANL), and will be used to detect and identify fluctuations due to Lower-Hybrid Drift Instabilities (LHDI) generated during magnetic reconnection. We will present initial beam profiles of the source and lenses, comparison to the predictions of the optical design program ZEMAX, beam splitter performance, and overall performance benchmark measurements.

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