

Abstract Submitted  
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**Construction and Operation of a Retarding Field Energy Analyzer for a Helicon Plasma Source**<sup>1</sup> ZANE HARVEY, EARL SCIME, COSTEL BILOIU, West Virginia University, MICHAEL WEST, Australian National University, HELICON SOURCE GROUP TEAM<sup>2</sup>, SPACE, POWER AND PROPUSION GROUP TEAM<sup>3</sup> — A retarding field energy analyzer (RFEA) suitable for measurements in high density rf plasmas has been constructed and tested in two helicon plasma sources at West Virginia University. Similar RFEA's have been used to measure the acceleration of ions and the plasma potential in the double layers that spontaneously form in low pressure, expanding helicon plasmas [Charles et al., Phys. Plasmas 7, 5232 (2000)]. The stainless steel probe head contains four layers; each consisting of a Mylar insulator, nickel mesh, and a copper support ring. The layers are biased to provide non-target species repulsion, energy selection, secondary suppression, and current collection. In this work, we will describe details of the probe head design, preliminary measurements in argon, helium, and nitrogen plasmas, and comparison of RFEA and laser induced fluorescence measurements of ion energy distributions in argon plasmas.

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