

Abstract Submitted
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Ion Extraction from a Helicon Plasma Source for an Inertial Electrostatic Confinement Fusion Device¹ GABRIEL BECERRA, GERALD KULCINSKI, JOHN SANTARIUS, University of Wisconsin-Madison — HELIOS, an inertial electrostatic confinement (IEC) fusion device designed for advanced fuel studies [1], uses an external helicon plasma source, from which ions are extracted and subsequently accelerated radially into an electrostatic potential well set up by a semi-transparent cathode grid inside a spherical chamber. A campaign is underway to raise fusion rates to allow for diagnostic studies of IEC physics with helium-3 fuel, in order to benchmark the single-atomic-species formalism of VICTER, a Volterra integral-equation code on spherically convergent ion flow [2]. The helicon plasma has been characterized through double probe measurements of plasma density and electron temperature for various rf antenna and magnetic field geometries. Measurements of the extracted ion current using a witness plate and a Faraday cup are also presented.

[1] G.R. Piefer et al., Fusion Sci. Technol. 47, 1255 (2005).

[2] G.A. Emmert and J.F. Santarius, Phys. Plasmas 17, 013502 (2010).

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Gabriel Becerra
University of Wisconsin-Madison

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