

Negative Ion Studies in an IEC Fusion Device

E.C. Alderson, J.F. Santarius, G.A. Emmert, G.L. Kulcinski

Understanding of negative ions in Inertial Electrostatic Confinement (IEC) fusion devices has made substantial progress since their discovery [1]. Modeling of negative ion formation and energy spectrum evolution has been achieved by incorporating a negative ion physics subroutine into the VICTER code, a 1-D integral transport simulation of an IEC device [2]. Study of negative ion current focusing by the IEC device electrostatic potential structure has been undertaken by measuring the negative ion current azimuthal profile about the equator of the IEC device at various conditions. Besides presenting a novel way to produce negative ions, this work gives us a way to explore negative ion physics and gauge our understanding of the IEC device

[1] D.R. Boris, et al., Phys. Rev. E. 80, 036408 (2009).

[2] G.A. Emmert and J.F. Santarius, Phys. Plasmas 17, 013503 (2010).

