

Abstract Submitted  
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**A constricted plasma source for negative ions**<sup>1</sup> M.A. MUJAWAR, NCPST, Dublin City University, Dublin 9, Ireland, S.K. KARKARI, NCPST, Dublin City University, Dublin 9, Ireland & Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India, 382428, M.M. TURNER, NCPST, Dublin City University, Dublin 9, Ireland — A constricted plasma source is described which is characterized by a dense plasma close to the anode while the plasma expands outwards in a low pressure region (0.6 Pa) because of differential pressure between the cylindrical hollow cathode through which the gas is injected. Detail characterization of plasma parameters namely electron density ( $n_e$ ), positive ion density ( $n_+$ ) and plasma potential ( $V_p$ ) by hairpin, ion flux and floating emissive probes, respectively, reveals the presence of negative ions adjacent to the anode fall region of the expanding plasma when a mixture of Ar/O<sub>2</sub> was used as compared with the pure electropositive Ar gas. A linear increase of negative ion density ( $10^{16} \text{ m}^{-3}$ ) with modest operating powers (400 W) as achieved at low working pressure makes this source highly promising for cesium free negative ion sources.

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