

RESISTIVE DIFFUSION OF CESIUM PLASMA IN A STELLARATOR

by

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A b s t r a c t

At the Culham conference we reported on measurements of particle losses from cesium plasmas produced by contact ionization in our WENDELSTEIN stellarator, which was equipped with helical stabilizing windings of type $l = 2$ ¹⁾ We found particle loss rates to be much less than the anomalously high pump-out losses usually encountered in stellarators. Moreover, the relationship observed between ion input flux and the resultant particle density distribution was in agreement with calculations which assumed resistive diffusion across the magnetic confining field and recombination on the insulating surfaces of the supports of the plasma source, the latter constituting the predominant loss process.

In recent experiments, which will be described in this paper, surface recombination losses within the plasma volume could be made negligibly small. This was done by suspending the plasma source from a very thin wire and heating it by bombardment with a beam of energetic electrons. In this way it was possible to show that the radial transport of the cesium plasma is governed by resistive diffusion.

- 1) D. Eckhartt, G. v.Gierke, G. Grieger, Proceedings of the IAEA Conference on Plasma Physics and Controlled Nuclear Fusion Research, Culham (U.K.), Vol. II, 719 (1966)