RESULTS OF 3D FOKKER-PLANCK SIMULATION OF RIPPLE-INDUCED LOSS OF ALPHA PARTICLES IN TFTR

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ABSTRACT

The main purpose of this report is carrying out of 3D Fokker-Planck simulation of effect of ripple induced transport mechanisms on alpha particle behavior in DT experiments on TFTR. The approach of present report is alternative to Monte Carlo one used in Ref.[1]. It extends also 3D Fokker-Planck approach of Refs.[2,3] used for modeling of fusion product behavior in TFTR in axisymmetric limit. Present calculations take into account ripple induced diffusion (stochastic [4] and resonant collisional one [5]) as well as slowing down and first orbit loss. Ripple enhanced loss of alpha particles in TFTR DT discharges is simulated. In this report distributions of escaped fusion products over poloidal and pitch angles, and their energy spectra are obtained. Dependence of alpha loss on plasma current is investigated. The distribution function of confined alphas is obtained. Comparison of numerical results with lost alpha measurements [6] and pellet charge exchange ones [7] is carried out. It is shown that simulation of this report and experimental results are in satisfactory agreement.

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References