

Abstract Submitted
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Drift-orbit loss at the null-point in a snowflake divertor configuration¹ M.V. UMANSKY, D.D. RYUTOV, LLNL — The prompt loss of ion drift orbits at the null point may be an important effect in divertor tokamak edge plasmas [1]. In the snowflake divertor configuration [2], the prompt loss may be quite different from that in the standard X-point configuration, due to a quadratic dependence of the poloidal magnetic field on the distance from the null point. As a result, the zone affected by the prompt loss in snowflake geometry is significantly larger than that in the standard X-point configuration [3]. Continuing the analytic study in [3], here we consider more complicated cases using numerical calculation of drift orbits, including the effects of electric field and collisions. As a special case we include the case of heavy impurity ions in low charge states, where the effect of the vertical drift is the strongest. Results will be presented for realistic snowflake-like configurations based on parameters of existing tokamaks.

[1] C.S. Chang, S. Kue, and H. Weitzner, Phys. Plasmas, 9, 3854 (2002).

[2] D.D. Ryutov, Phys. Plasmas, 14, 064502, June 2007.

[3] D.D. Ryutov and M.V. Umansky, presentation at TTF 2009.

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