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Enhanced Neoclassical Transport and Mode Damping Caused by Chaos Near an Asymmetric Separatrix[1] D.H.E. DUBIN, UCSD, YU.A. TSIDULKO, Budker Inst. — Plasma loss due to apparatus asymmetries is a ubiquitous phenomenon in magnetic plasma confinement. Recent experiments have investigated the loss rate when a central squeeze potential is applied to a magnetized plasma column, creating two trapped particle populations separated by a separatrix.[2] These populations react differently to the asymmetries, leading to a collisional boundary layer at the separatrix. A loss rate scaling as $\sqrt{\nu/B}$ due to the boundary layer is expected theoretically,[1] provided that the separatrix itself is axisymmetric. However, when the separatrix is *asymmetric*, particles become trapped and detrapped as they follow collisionless orbits. This can lead to a chaotic region around the separatrix, giving enhanced transport scaling as $\nu^0 B^{-1}$. This effect also damps certain plasma modes. Predictions for damping of trapped particle diocotron modes will be compared to experiments.[3]

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[2]D.H.E. Dubin, Phys. Plasmas **15**, 072112 (2008); D.H.E. Dubin *et al.*, Neoclassical transport and plasma mode damping caused by collisionless scattering across an asymmetric separatrix, in preparation.
[3]A.A. Kabantsev, adjacent poster.

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