Calculation of stochastic broadening due to low mn magnetic perturbation in the simple map in action-angle coordinates COURTNEY HINTON, ALKESH PUNJABI, HALIMA ALI, Hampton University — The simple map is the simplest map that has topology of divertor tokamaks [A. Punjabi, H. Ali, T. Evans, and A. Boozer, Phys. Let. A **364**, 140–145 (2007)]. Recently, the action-angle coordinates for simple map are analytically calculated, and simple map is constructed in action-angle coordinates [O. Kerwin, A. Punjabi, and H. Ali, Phys. Plasmas **15**, 072504 (2008)]. Action-angle coordinates for simple map cannot be inverted to real space coordinates (R,Z). Because there is logarithmic singularity on the ideal separatrix, trajectories cannot cross separatrix [*op cit*]. Simple map in action-angle coordinates is applied to calculate stochastic broadening due to the low mn magnetic perturbation with mode numbers m=1, and n=±1. The width of stochastic layer near the X-point scales as 0.63 power of the amplitude δ of low mn perturbation, toroidal flux loss scales as 1.16 power of δ, and poloidal flux loss scales as 1.26 power of δ. Scaling of width deviates from Boozer-Rechester scaling by 26% [A. Boozer, and A. Rechester, *Phys. Fluids* **21**, 682 (1978)]. This work is supported by US Department of Energy grants DE-FG02-07ER54937, DE-FG02-01ER54624 and DE-FG02-04ER54793.

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