Abstract Submitted for the DPP14 Meeting of The American Physical Society

Homoclinic tangle of separatrix of the simple map LATOYA PRESSLEY, TANZANIA GUEST, NAKEISHA JOHNSON, ALKESH PUNJABI, HALIMA ALI, Hampton University — The simple map is the simplest symplectic map that has the generic magnetic topology of divertor tokamaks. The generating function of the simple map is  $S(x,y) = x^2/2+y^2/2-y^3/3$ . S = 1/6 gives the separatrix surface. The scaling of safety factor on the magnetic axis,  $q_0$ , with map parameter k is used to calculate the number of iterations of the simple map,  $N_p$ , that is equivalent to a single toroidal circuit of the tokamak. The scaling of root mean square deviation of energy on the  $q_{95}$  surface with map parameter k is taken as the estimate of magnetic asymmetry to represent the magnetic perturbation from map parameter k. These data is used in the forward and backward simple maps to calculate the homoclinic tangle of the separatrix of divertor tokamaks from magnetic asymmetries. This work is supported by grants DE-FG02-01ER54624, DE-FG02-04ER54793, and DE-FG02-07ER54937.

> Alkesh Punjabi Hampton University

Date submitted: 10 Jul 2014

Electronic form version 1.4