

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Banana Regime Neoclassical Ion Heat Flux with Retention of the Field Term in the Linearized Collision Operator¹ J.B. PARKER, Princeton U., P.J. CATTO, MIT — The standard calculation of neoclassical ion heat flux in the large aspect ratio, circular flux surface, banana regime limit uses a model collision operator where only pitch angle scattering is retained and an *ad hoc* term is introduced to preserve conservation of momentum.² The full linearized collision operator contains also an energy diffusion term and a complicated field term which involves an integral over the perturbed distribution, both of which are dropped in the standard calculation. We reexamine the standard treatment by considering the field as well as the test particle portions of the linearized collision operator and by using an expansion in the eigenfunctions associated with the transit-averaged pitch angle scattering collision operator.³ We focus on modifications due to the field term to attempt to determine if corrections are needed to the standard result in the large aspect ratio limit.

¹Work supported by a U.S. DOE FES Fellowship and by U.S. DOE Contract No. DE-FG02-91ER-54109.

²M. N. Rosenbluth, R. D. Hazeltine, and F. L. Hinton, Phys. Fluids **15**, 116 (1972)

³Y. Xiao, P. J. Catto, and K. Molvig, Phys. Plasmas **14**, 032302 (2007)

J. B. Parker
Princeton U.

Date submitted: 02 Aug 2011

Electronic form version 1.4