Non-local plasma heat flow in a perturbed magnetic field[1] JOHN JAMES, ERIC HELD, Utah State University — In this work, we review the derivation and implementation of a non-local closure[2] for the field-aligned heat flow in the plasma fluid temperature equation. We apply the closure to a plasma embedded in a sheared slab magnetic field configuration with a single-helicity perturbation and compare derived quantities such as effective radial thermal diffusivity and on-axis plasma temperature with those obtained using a flux-limiting and a local diffusive form for the closure. A novel algorithm for rapid approximation of the heat-flow integrals involved in calculating the non-local closure is presented along with results from validity and convergence tests.

John James
Utah State University

Date submitted: 11 Sep 2006   Electronic form version 1.4