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Drift-Waves and Stability in the GAMMA-10 J. PRATT, W. HORTON, UT Austin — The tandem mirror system has achieved high energy confinement times ($70-90$ ms) and radial-loss times that dominate the Pastukhov end-loss time ($>$ 100 ms). This high confinement regime establishes a proof of principle that the combination of electrostatic and mirror confinement can successfully insulate electrons from thermal end losses. For the first time, the stored plasma energy of the ions within the plug-barrier end cells exceeds that of the central-cell magnetically-trapped ions. Tandem mirrors exhibit a qualitatively different type of drift-wave transport than do toroidal devices, as we have shown by developing confinement time scaling predictions (J. Pratt and W. Horton, Phys. Plasmas (13), 2006). We analyze electrostatic drift-wave eigenmodes for the electrostatic potential and the magnetic perturbation in the GAMMA-10. Using teraFLOPS-speed, large-scale parallel computers, we then integrate particle orbits in these eigenmode fields.

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