TH/P4-14 Summary: R.E. Waltz, E.M. Bass, and He Sheng
"A critical gradient model for energetic particle transport from Alfven eigenmodes: GYRO verification, DIII-D validation, and ITER projection"

- The linear rate recipe $\gamma_{AE\text{-}ITG/TEM} > \gamma_{ITG/TEM}$ for the critical gradient for Alfven eigenmode (AE) transport of energetic particles (EPs) has been verified by new local nonlinear GYRO simulations with low-n AE modes embedded in high-n ITG/TEM mode turbulence.

- The critical gradient model (CGM) has been validated by DIII-D with NBI EP's using the ALPHA EP density transport code: the importance of orbit drift broadening of the critical gradient profile in DIII-D and energy dependence of AE transport of EP's is stressed.

- The ALPHA code ITER projection for fusion alpha confinement revised with a CGM for AE simultaneous drive from (and transport of) 3.5 Mev alphas and 1Mev NBI shows that alpha AE transport losses can be doubled with the additional AE drive from the NBI.

- A more practical CGM based on the linear rates (AE threshold) determined by TGLF (and verified by GYRO linear rates) illustrates how the AE transport of NBI EPs in DIII-D gets shut-off as the current penetrates with q_{min} dropping from 4.5 to 1.0 and increasing shear: the critical gradient rising above the slowing down gradient (except at the very center).