Abstract Submitted
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Validation of the TGLF-EP+Alpha critical-gradient model of energetic particle transport in DIII-D[1] ERIC BASS, University of California, San Diego, CAMI COLLINS, MICHAEL VAN ZEELAND, General Atomics, WILLIAM HEIDBRINK, University of California, Irvine, RONALD WALTZ, General Atomics — The TGLF-EP+Alpha [1] critical-gradient model of energetic-particle (EP) transport is here validated against five DIII-D H-mode scenarios, predicting how Alfvén eigenmodes driven by beam ions éadially flatten the EP profile. The critical gradient comes from the TGLF [2] gyro-Landau fluid code, optimized for EP-AE physics, automated, and highly parallelized by the TGLF-EP wrapper code. TGLF-EP+Alpha is fully physics based, requiring only experimental equilibrium and beam source as inputs. It is computationally inexpensive enough to perform extensive scoping studies needed for scenario optimization. Cases show observed neutron production near classical down to an 80% deficit. TRANSP simulations using the EP diffusion coefficient predicted by TGLF-EP+Alpha find neutron deficits within 20% of experimental observations in applicable cases. [1] He Sheng et al, *Phys. Plasmas* **24**, 072305 (2017) [2] G. M. Staebler et al, *Phys. Plasmas* **14**, 55909 (2007)

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