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Status of parallel Python-based implementation of UEDGE¹ M.V. UMANSKY, A.Y. PANKIN, T.D. ROGNLIEN, A.M. DIMITS, A. FRIEDMAN, I. JOSEPH, LLNL — The tokamak edge transport code UEDGE [1] has long used the code-development and run-time framework Basis [2]. However, with the support for Basis expected to terminate in the coming years, and with the advent of the modern numerical language Python, it has become desirable to move UEDGE to Python, to ensure its long-term viability. Our new Python-based UEDGE implementation takes advantage of the portable build system developed for FACETS [3]. The new implementation gives access to Python's graphical libraries and numerical packages for pre- and post-processing, and support of HDF5 simplifies exchanging data. The older serial version of UEDGE has used for time-stepping the Newton–Krylov solver NKSOL. The renovated implementation uses backward Euler discretization with nonlinear solvers from PETSc [4], which has the promise to significantly improve the UEDGE parallel performance [5]. We will report on assessment of some of the extended UEDGE capabilities emerging in the new implementation, and will discuss the future directions. [1] Rognlén et al., J. Nuc. Mat. 196, 347–123 (1992); [2] Dubois. et al. LLNL Report UCRL-MA-118543-PT-2 (1994); [3] Cary et al., J. Physics: Conference Series 180 (2009) 012056 (2009); [4] Balay et al., ANL Technical Report ANL-95/11 (2011); [5] McCourt et al., Comp. Science & Discovery 5 014012 (2012).

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