

Abstract Submitted
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The CULART Experiment CELSO RIBEIRO, Fuse Energy Technologies Inc — The Compact device with Ultra-Low Aspect-Ratio Tokamak plasmas (CULART) is a medium-size device [1]. The major objective of this proposal is twofold. First, to explore very high beta limits under the relatively low-medium toroidal field (TF). Secondly, as a proof-of-concept, to use these high beta plasmas as a target for applying the adiabatic compression (AC) technique [2] in order to raise temperature and density thus to attain substantial neutron yields and fusion power. CULART is intended to benefit from present day technology, the achievements of tokamak fusion research, and the advantage of using ohmic and AC heating regimes exclusively. Using the AC technique in CULART sets a pathway to study the potential for a high efficiency, ultra-compact, repetitive-pulsed neutron source based on the spherical tokamak (ST) concept and serve as a benchmark for appropriate scaling towards a fusion reactor and related material studies. It can also be used for more immediate applications in broad areas of physical science beyond fusion energy. Simulations of AC up to 1MW in D-T fuel plasmas, MHD equilibrium and stability will be presented. [1] C. Ribeiro, Proc. 28th Symposium of Fusion Engineering (SOFE), Jacksonville, FL, US, June, 2-6 (2019). [2] H. P. Furth and S. Yoshikawa, Phys. of Fluids, 13, 2593 (1970).

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