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The High Field Ultra Low Aspect Ratio Tokamak (HF-ULART)
CELSO RIBEIRO, Consultant in Plasma Physics — Recently, a medium-size HF-ULART has been proposed[1]. The major objective is to explore the high beta and pressure under the high toroidal field, using present day technology. This might be one of pathway scenarios for a potential ultra-compact pulsed neutron source (UCP-NS) based on the spherical tokamak (ST) concept, which may lead to more steady-state NS or even to a fusion reactor, via realistic design scaling. The HF-ULART pulsed mode operation is created by quasi-simultaneous adiabatic compression (AC) in both minor and major radius of a very high beta plasma, possibly with further help of passive-wall stabilization, as envisaged in the RULART concept[2]. This may help the revival of the studies of the AC technique in tokamaks, alongside the less compact and more complex ST-40 device, currently under construction[3]. In addition, by similarities, studies in HF-ULART as a UCP-NS may also help to test the feasibility of the compact NS via the spheromak concept, which also uses the AC technique[4]. Simulations of AC in HF-ULART plasmas will be presented. [1] C Ribeiro IAEA-RUSFD 2017 [2] C Ribeiro Proc. 26th SOFE 2015 [3] M Gryaznevich et al 18th Inter. Spherical Torus Workshop (ISTW) 2015 [4] P Sieck et al US-Japan Workshop on Compact-Torus 2016

Celso Ribeiro
Consultant in Plasma Physics

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