

Abstract Submitted
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HIDRA: A new device for PFC and PMI development DANIEL ANDRUCZYK, DAVID N. RUZIC, JEAN PAUL ALLAIN, DAVIDE CURRELI, University of Illinois Urbana - Champaign, HIDRA TEAM — A toroidal plasma device is being constructed at the University of Illinois dedicated in part as a toroidal liquid-metal PFC technology test bench. The Hybrid Illinois stellarator/tokamak Device for Research and Applications (HIDRA) is a medium sized classical stellarator (previously WEGA, IPP Greifswald) with, $R = 0.72$ m, $a = 0.19$ m, $B < 0.5$ T and will be able to reach $T_e = 10\text{-}50$ eV, $n_e = 10^{17}\text{-}10^{18}$ m⁻³ with plasmas running up to several minutes. A critical knowledge gap for liquid-metal PFCs is their integration and performance in asymmetric confinement fusion environments. HIDRA will be used to evaluate technologies such as TEMHD driven flows for the first wall, help address key questions including whether a full toroidal liquid-metal loop can operate in a toroidal machine, test low recycling regimes and whether D can be removed and recycled easily. Also, UIUC's experience with in-situ diagnostics will open up new opportunities for innovative Material Application Testing (HIDRA-MAT).

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