

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

PUFFIN: a new microsecond, mega-ampere pulser for magnetised HED plasma physics JACK D. HARE, SIMON N. BLAND, Blackett Laboratory, Imperial College, London, SW7 2AZ, UK, GUY C. BURDIAC, First Light Fusion Ltd, Oxford, OX5 1QU, UK, SERGEY V. LEBEDEV, Blackett Laboratory, Imperial College, London, SW7 2AZ, UK — Many interesting plasma physics phenomena in the universe develop over long time scales. One example is magnetohydrodynamic turbulence, which must be driven over many hydrodynamic time scales to reach the statistical steady state typical of astrophysical plasmas. Existing pulsed-power generators are usually optimised for very fast rise times (~ 100 ns), which can drive the rapid implosions which generate bright x-rays sources. However, for basic plasma physics or laboratory astrophysics studies it is desirable to drive the plasma over longer timescales. In this poster we discuss the design of PUFFIN, a medium sized pulsed power facility with a 1-2 MA peak current and a 2 μ s rise time, based on the LTD-5 modules developed at CEA Gramat. PUFFIN will be constructed at the Plasma Science and Fusion Center at MIT starting in January 2021. It will be a versatile driver of magnetised HED plasmas and will provide a testbed for diagnostic development. Particularly topics of interest include magnetised turbulence, magnetic reconnection, and transport and instabilities in magnetised plasmas.

Jack Hare
Blackett Laboratory, Imperial College, London, SW7 2AZ, UK

Date submitted: 29 Jun 2020

Electronic form version 1.4