Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

A magnetized plasma apparatus for non-linear microwave interaction experiments[1] K RONALD, D SPEIRS, A PHELPS, B ELIASSON, A CROSS, C WHYTE, C ROBERTSON, SUPA and Department of Physics, University of Strathclyde, Glasgow, UK, R CAIRNS, School of Mathematics and Statistics, University of St Andrews, UK, M KOEPKE, Department of Physics, West Virginia University, Morgantown, USA, R BINGHAM, STFC Rutherford Appleton Laboratory, Harwell, Oxfordshire, UK — Following a series of laboratory experiments [1,2] simulating natural plasma instabilities [3], a larger apparatus is being constructed for experiments on nonlinear coupling between microwaves in plasma, relevant to laser-plasma, ionospheric, and magnetically confined fusion plasma environments. Normalized intensities approaching those used in some recent laser plasma interactions can be generated using flexible microwave amplifiers, whilst the relatively accessible plasma relevant to coupling of microwave frequency signals will enable the use of insertion diagnostics in addition to stand-off analysis of the EM signals. The linear plasma experiment will be magnetized at up to 0.08T, an RF helicon source will be used to generate a dense, large, cool plasma with high ionization fraction (n_e up to $10^{19}m^{-3}$ has been reported in other helicon experiments). The paper will present the proposed apparatus and outline the envisioned research program. [1] S.L. McConville, et al., Plasma Phys. Control. Fusion, 50, 2008, 074010, [2] K. Ronald, et al., Phys. Plasmas, 15, 2008, 056503, [3] D.C. Speirs, et al., Phys. Rev. Lett., 113, 2014, 155002.

[1]The authors gratefully acknowledge support from the UK EPSRC (EP/R004773/1), MBDA UK Ltd and TMD Technologies Ltd.

Kevin Ronald
Univ of Strathclyde

Date submitted: 18 Jun 2018 Electronic form version 1.4