Abstract Submitted
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Probing spherical tokamak plasmas using charged fusion products[1] WERNER U. BOEGLIN, Dept of Physics, Florida International University, Miami FL 33199, RAMONA V. PEREZ, Dept. of Physics, Florida International University, Miami FL 33199, DOUGLASS S. DARROW, PPPL, Princeton NJ 08543, MARCO CECCONELLO, IWONA KLIMEK, Dept. of Physics and Astronomy, Uppsala University, Uppsala SE-751 20, Sweden, SCOTT Y. ALLAN, ROB J. AKERS, OWEN M. JONES, DAVID L. KEELING, KEN G. MCCLEMENTS, RORY SCANNELL, CCFE, Culham Science Centre, Abingdon, OX14 3DB, UK
— The detection of charged fusion products, such as protons and tritons resulting from D(d,p)t reactions, can be used to determine the fusion reaction rate profile in large spherical tokamak plasmas with neutral beam heating. The time resolution of a diagnostic of this type makes it possible to study the slowly-varying beam density profile, as well as rapid changes resulting from MHD instabilities. A 4-channel prototype proton detector (PD) was installed and operated on the MAST spherical tokamak in August/September 2013, and a new 6-channel system for the NSTX-U spherical tokamak is under construction. PD and neutron camera measurements obtained on MAST will be compared with TRANSP calculations, and the design of the new NSTX-U system will be presented, together with the first results from this diagnostic, if available.

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Werner U. Boeglin
Dept. of Physics, Florida International University, Miami FL 33199

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