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Initial Measurements of Energetic DT Neutron Tails on TFTR and JET Using Bubble Neutron Detectors¹ R.K. FISHER, P.B. PARKS, General Atomics, M.N. ROSENBLUTH, ITER, S.S. MEDLEY, A.L. ROQUEMORE, R.V. BUDNY, D.L. JASSBY, PPPL, M.L. LOUGHLIN, JET, N.N. GORELENKOV, TRINITI -Measurement of the DT neutron energy spectrum above ~ 16 MeV will vield information on the spatial and energy distributions of confined alphas in the plasma core of ITER. These energetic neutrons result from fusion reactions involving the energetic ions created by knock-on alphafuel ion collisions. Bubble neutron detectors, because they only detect neutrons with energies above a selectable threshold energy, are a highly attractive approach to measuring the very small (< 10^{-4}) fraction of neutrons in the knock-on tail. Tests of these detectors on TFTR resulted in no measureable response to neutrons with energies below threshold with an upper limit at least 10 times better than that required for knockon measurements on ITER. TFTR DT neutron spectra, measured with bubble detectors having design thresholds between 14 and 19 MeV, show a neutron tail above 16 MeV resulting from burnup of DD tritons and from alpha knock-on collisions.

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Prefer Oral Session Prefer Poster Session R.K. Fisher fiherr@gav.gat.com General Atomics

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