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Progress towards a fast ion collective Thomson scattering diagnostic for ITER S.B. KORSHOLM, Riso National Laboratory/PSFC MIT, H. BINDSLEV, F. LEIPOLD, F. MEO, P.K. MICHELSEN, S. MICHELSEN, S.K. NIELSEN, E.L. TSAKADZE, Riso, P.P. WOSKOV, MIT, E. WESTERHOF, FOM, J.W. OOSTERBEEK, J. HOEKZEMA, IPP, FZ Juelich, F. LEUTERER, D. WAGNER, IPP, Garching — Diagnosing the dynamics of confined fast ions is an important challenge for burning plasmas such as ITER, where the physics of fusion alpha particles will be a key research topic. Fast ion collective Thomson scattering (CTS) can meet this need, and is maturing in CTS experiments at TEXTOR and at ASDEX Upgrade. We present results of the TEXTOR CTS diagnostic, currently in operation using an 180kW, 110GHz gyrotron and an upgraded receiver. Scattered spectrums for localized ($\sim$10cm), time resolved (4ms) measurements of ion velocity distributions in plasmas with NBI have been obtained and tests with ICRH plasmas have started. The CTS diagnostic at ASDEX Upgrade will be operational in the next campaign using a new 1MW gyrotron at 105GHz with spatiotemporal resolutions similar to TEXTOR. Design of the proposed fast ion CTS diagnostic for ITER will also be presented. It contains two 60GHz, 1MW gyrotron beams viewed by two fixed receiver arrays located on the low and high field sides of the plasma. Measurements of the parallel and perpendicular components of the ion velocity distribution over the full plasma cross section with resolutions better than a/10 and 100ms will be possible. Supported by U. S. DoE and EURATOM.

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