

Abstract Submitted
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ITER Plasma at Ion Cyclotron Frequency Domain: The Fusion Alpha Particles Diagnostics Based on the Stimulated Raman Scattering of Fast Magnetosonic Wave off High Harmonic Ion Bernstein Modes¹ V.

ALEXANDER STEFAN, Institute for Advanced Physics Studies, Stefan University, La Jolla, CA 92037 — A novel method for alpha particle diagnostics is proposed. The theory of stimulated Raman scattering, SRS,² of the fast wave and ion Bernstein mode, IBM, turbulence in multi-ion species plasmas³ is utilized for the diagnostics of fast ions, (4)He (+2), in ITER⁴ plasmas. Nonlinear Landau damping of the IBM on fast ions near the plasma edge leads to the space-time changes in the turbulence level, (inverse alpha particle channeling). The space-time monitoring of the IBM turbulence via the SRS techniques may prove efficient for the real time study of the fast ion velocity distribution function, spatial distribution, and transport.

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²V. Alexander Stefan, ITER Plasma at Electron Cyclotron Frequency Domain: Tokamak Core Plasma Diagnostics Based on the Synergy of Stimulated Raman and Brillouin Scatterings, Bulletin of the American Physical Society, 54th Annual Meeting of the APS Division of Plasma Physics, Volume 57, Number 12, 2012; Abstract: TO6.00010

³V. Alexander Stefan, *Nonlinear Electromagnetic Radiation Plasma Interactions*, (Stefan University Press, La Jolla, CA, 2008).

⁴E. P. Velikhov, (Kurchatov Institute, Moscow, Russia), private communication in La Jolla, CA, 2007.

V. Alexander Stefan
Institute for Advanced Physics Studies, Stefan University, La Jolla, CA 92037

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