

Abstract Submitted  
for the DPP20 Meeting of  
The American Physical Society

**The ITER-Core Turbulent Plasma Diagnostics Based on the Synergy of Stimulated Raman and Brillouin Scattering**<sup>1</sup> V. ALEXANDER STEFAN, The Marshall Nicholas Rosenbluth Center for Thermonuclear Fusion Studies (Stefan University) — A novel plasma diagnostic method<sup>2,3</sup> is proposed based on the synergy of stimulated Raman and Brillouin scattering. A nonlinear electron-Bernstein mode is excited in a 4-wave parametric coupling. The synergy between stimulated Raman and Brillouin scattering is analyzed. The scatterings off electron Bernstein mode is analyzed for the gyrotron frequency of 170GHz; X-Mode and O-Mode power of 24 MW CW; on-axis B-field of 10T. The stimulated scattering in the electron cyclotron frequency range of the X-Mode and O-Mode driver with the ITER plasma lead to the appearance of suprathermal electrons and dragged by them accelerated ions at the plasma edge with the parameters directly dependent on the plasma parameters in the core of the ITER. Plasma diagnostic in the core region, (ion temperature), can be performed by the diagnostics of suprathermal electrons and accelerated ions at the edge plasma.

<sup>1</sup>Supported by Nikola Tesla Labs, Stefan University.

<sup>2</sup>R. Prater et. al., APS-DPP-2009, (BAPS.2009.DPP.NO4.11); V. A. Stefan, APS-DPP-2019, GP10.00091

<sup>3</sup>Evgeny Pavlovich Velikhov, private (tel.) communication, May, 2019; V. Alexander STEFAN, *Nonlinear Electromagnetic Radiation Plasma Interactions*, (S-U-Press, 2008).

V. Alexander Stefan  
Stefan University

Date submitted: 26 Jun 2020

Electronic form version 1.4