

TH/P4-32 “Low-Threshold Two-UH-Plasmon Decay as a Reason for Anomalous Backscattering and Absorption in Second Harmonic ECRH Experiments” by E.Z. Gusakov, A.Yu. Popov

- 1) The drastic decrease of the two-UH-plasmon parametric decay instability (PDI) power threshold due to the **3D trapping of the daughter UH waves in the presence of a nonmonotonous density profile and a finite waist pump beam** is demonstrated.
- 2) The saturation of low-threshold X-mode two-UH-plasmon PDI is shown to be due the **secondary decays of the daughter waves**, which lead to the excitation of the **radially trapped UH waves** and the ion Bernstein (IB) waves.
- 3) The observation of the mysterious anomalous backscattering at TEXTOR is explained by nonlinear coupling of different daughter UH waves. This scenario **reproduces the fine details of the frequency spectrum** of the anomalously reflected X-mode and the **absolute value** of the backscattering signal.
- 4) For the TEXTOR conditions up to **25% pump wave power** anomalous absorption is predicted.
- 5) Electron heating by the daughter UH waves far from the regions prescribed by linear ECRH theory and ion acceleration by the daughter IB waves is predicted.