

Abstract Submitted  
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**3D ELM fluctuation measurements with the new dual array ECE-Imaging diagnostic on ASDEX Upgrade** IVO CLASSEN, BRANKA VANOVAČ, FOM DIFFER, CALVIN DOMIER, NEVILLE LUHMANN, UC Davis, ANTON BOGOMOLOV, FOM DIFFER, WOLFGANG SUTTROP, Max Planck Inst, BENJAMIN TOBIAS, UC Davis, ASDEX UPGRADE TEAM — In a major upgrade, the (2D) electron cyclotron emission imaging diagnostic (ECE-Imaging) at ASDEX Upgrade (AUG) has been equipped with a second detector array, and has been successfully commissioned. The two detector arrays observe the plasma through the same vacuum window, both under a slight toroidal angle, to enable quasi-3D measurements of the electron temperature. The system measures a total of 288 channels, in two toroidally separated 2D arrays of approximately 50 cm vertically by 10 cm radially. The toroidal separation between the two poloidal observation planes is about 40 cm, such that the majority of the field lines is observed by both arrays simultaneously, thereby enabling a direct measurement of the 3D properties of plasma instabilities like ELM filaments. The toroidal separation of 40 cm is sufficient for the accurate measurement of both phase differences and transit times of (rotating) plasma structures, enabling a distinction between time varying 2D structures and true 3D structures (not possible with 2D diagnostics). The research will mainly focus on the investigation of the 3D structure of the temperature fluctuations related to edge localized modes (ELMs), in particular precursors and filaments. The first results on ELMs will be reported.

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