Universality in scrape-off layer plasma fluctuations: Comparison of experiment to numerical simulations RALPH KUBE, ODD ERIK GARCIA, AUDUN THEODORSEN, UiT - The Arctic University of Norway, DAN BRUNNER, BRIAN LABOMBARD, JAMES TERRY, MIT Plasma Science and Fusion Center, MATTHIAS WIESENBERGER, Technical University of Denmark — Particle density time series, sampled in the outboard mid-plane scrape-off layer, are interspersed by large amplitude bursts due to radial propagation of plasma blobs. GPI and Langmuir probe time series measured in the Alcator C-Mod tokamak suggest that conditionally averaged wave forms of large amplitude bursts are well described by a double exponential function. Furthermore remains the ratio of the rise and fall e-folding time of the conditionally averaged wave form constant over a range of line-averaged plasma densities. In this contribution we compare this finding to results from numerical simulations. A two-dimensional drift-fluid model has been used to simulate the propagation of seeded plasma blobs in scrape-off layer plasmas for various initial amplitudes and cross-field sizes. Time traces of the particle density, sampled at a single point, are compared to the conditionally averaged waveform of the experimental data time series. The results are interpreted in the framework of a stochastic model which relates the statistical properties of the SOL fluctuations to the profile scale length.

Ralph Kube
UiT - The Arctic University of Norway