

Abstract for an Invited Paper
for the DPP11 Meeting of
The American Physical Society

Two-dimensional imaging of edge-localized filaments in KSTAR *H*-mode plasmas¹

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The temporal evolution of edge-localized modes (ELM) has been studied using a 2-D electron cyclotron emission imaging (ECEI) system in KSTAR.³ The ELMs are observed to evolve in three distinctive stages: initial linear growth of multiple filamentary structures having a net poloidal velocity, interim saturated state, and final crash. The crash phase, typically consisting of multiple bursts of a single filament, involves a complex dynamics; an abrupt change in the poloidal mode number, poloidal elongation of the bursting filament, development of a fingerlike bulge, and fast localized burst through the finger. A significant alteration of the ELM dynamics, such as mode number, poloidal flows, and crash time scale, has been revealed during a recent investigation of external magnetic perturbations ($n = 1$) on ELMs.

¹Work performed under the auspices of the NRF Korea, the US DOE, and the Euratom-FOM association.

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³G. S. Yun *et al.*, Phys. Rev. Lett. **107**, 045004 (2011).