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Slow conversion of ideal MHD perturbations into a tearing mode after a sawtooth crash VALENTIN IGOCHINE, ANJA GUDE, SIBYLLE GÜNTER, KARL LACKNER, QINGQUAN YU, LAURA BARRERA ORTE, Max Planck Institute for Plasma Physics, Boltzmannstr. 2, 85748 Garching, Germany, ANTON BOGOMOLOV, IVO CLASSEN, FOM-Institute DIFFER, Dutch Institute for Fundamental Energy Research, 3430 BE Nieuwegein, The Netherlands, RACHAEL MCDERMOTT, Max Planck Institute for Plasma Physics, Boltzmannstr. 2, 85748 Garching, Germany, NEVILLE C. LUHMANN, JR, University of California at Davis, Davis, California, CA 95616 USA-Institute, ASDEX UPGRADE TEAM — Optimization of the plasma performance with respect to beta normalized, β_N, is one of the main goals of fusion research. Unfortunately, the β_N value in standard H-mode and advanced scenario discharges is limited by resistive instabilities, usually neoclassical tearing modes (NTMs). These modes are metastable and thus can be triggered by other MHD events at very low β_N values for large perturbations. Sawteeth typically provide the strongest magnetic perturbations and are able to trigger the modes at the smallest normalized beta values. We have investigated the mechanism of the seed island formation by sawteeth in much detail. Careful analysis of electron cyclotron emission, magnetic probes and Soft X-ray measurements directly after the crash reveals the existence of an ideal (2,1) magnetic perturbation at the q=2 surface directly after the crash. This ideal perturbation converts into a tearing mode on a timescale much longer than the sawtooth crash time.

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