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Core plasma behavior during sawtooth activities in highly-elongated ohmic/ECH tokamak plasmas JUNGHEE KIM, SEUNG HUN LEE, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, Korea, G. TURRI, H. WEISEN, Ecole Polytechnique Fédérale de Lausanne, Centre de Recherches en Physique des Plasmas, Lausanne, Switzerland, W. CHOE, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, Korea — MHD instabilities arising from the combination of pressure and current profiles can deform the core plasma shape. The sawtoothing highly-elongated plasma shows various topological behaviors inside the $q=1$ surface. The irreversible topology-breaking of the core plasma occurs distinctively in highly-elongated ohmic plasma. On the contrary, the topological change does not occur in the ECH plasma under the same shaping factors because the increased conductivity results in the change of the current profile and thus affecting the Mercier criterion. In addition, the topology-breaking depends on the heating position. The ECH on the off-axis or the $q=1$ surface preserves the core topology during the crash. However, the intense on-axis ECH can change the core topology, which is reversible. The explanation for these activities is given by topological categorization and the stability analyses of the kink mode with pressure and current profiles.

Junghee Kim
Department of Physics, Korea Advanced Institute of Science and
Technology, Daejeon, Korea

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