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Impact of Alfvénic activities to the KSTAR advanced scenario operation JISUNG KANG, JUNGHEE KIM, TONGNEYOL RHEE, National Fusion Research Institute, MARIO PODEST, RAFFI NAZIKIAN, PPPL, SANGHEE HAHN, JINIL CHUNG, YOUNGMU JEON, National Fusion Research Institute, J. M. PARK, ORNL, Y.-S. NA, Seoul National University, JAEMIN KWON, SIWOO YOON, National Fusion Research Institute — This study reports the results of fast-ion transport induced by Alfvénic activities, which is one of the key to achieving KSTAR high-performance scenario and forming various q-profiles. Over the past several years, KSTAR has successfully performed the high beta experiments with suppressed high frequency MHD mode in various toroidal magnetic field and q95 regimes. It is found that the plasma performance degradation and corresponding beta loss are often accompanied by high-frequency Alfvénic activities. Mode control experiments have also been carried out several times to recover the plasma stored energy as the Alfvénic mode disappears utilizing control knobs such as ECH. Furthermore, a high minimum safety factor scenario has been developed by manipulating plasma current ramp-up rate and heating/shaping timing. It has been found that fast-ion transport occurring in the safety factor profile of minimum q over 2 plays a major role. Numerical investigation with NOVA / Kick-model performed, so that the strong impact of the mode was intensively analyzed. Finally, the outlook for the future advanced operation scenario of KSTAR is discussed.

Jisung Kang
National Fusion Research Institute

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