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Role of the magnetic island and low-k turbulence on radial electron heat transport M. J. CHOI, H. K. PARK, Y. IN, S. H. KO, H. S. KIM, C BAE, J. M. KWON, W. LEE, K. D. LEE, H. H. LEE, W. H. KO, S. H. LEE, J. H. LEE, J. KO, J. KIM, M. H. WOO, M. JEONG, B. H. PARK, National Fusion Research Institute, G. S. YUN, Pohang University of Science and Technology, J. LEE, M. KIM, Ulsan National Institute of Science and Technology, N. C. LUHMANN, JR., University of California at Davis — Magnetic islands can enhance or reduce the radial transport either by reconnecting field lines or producing the poloidal flow shear across the rational surface. Both cases have been observed in the KSTAR L-mode plasmas. In the first case, the temperature inside the $q = 2$ surface decreases severely (∼25%) with the enhanced transport by the rotating $m/n = 2/1$ magnetic island. However, in the case where the 2/1 magnetic island is driven and locked by the $n = 1$ resonant magnetic perturbation, the transport is reduced and the electron temperature (Te) gradient is increased across the island with a clear poloidal flow shear. The poloidal flow shear has been identified utilizing electron cyclotron emission imaging (ECEI) measurements of the low-k turbulent Te fluctuations driven by the increased Te gradient. In addition, the interaction between the Te turbulence and magnetic island causes the transient heat transport events and affects the transport characteristics near the $q = 2$ region.

Woochang Lee
National Fusion Research Institute

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