Due to strong toroidal magnetic field (TF), glow discharge conditioning (GDC) would not be properly working in a superconducting tokamaks while TF field is turned on. This makes inter-shot wall conditioning difficult, and thus, authors have developed alternative ways such as Ion Cyclotron Wall Conditioning (ICWC) \cite{1} and Electron Cyclotron Wall Conditioning (ECWC) \cite{2}. Meanwhile, ITER is considering a disruption mitigation system (DMS) based on massive material injection, so called “shattered pellet injection (SPI)” system. SPI injects pellets of sizes larger than several mm, a huge amount of D$_2$ gas or noble impurity (Ne or Ar) were released. This induces high rates of wall retention of gas atoms: Plasma start-up itself was impossible after SPI was used. Therefore, a massive wall conditioning has to be performed for a reliable plasma startup after a SPI shot. KSTAR is one of main participants of SPI experiment for ITER DMS with its symmetric dual SPIs.

In this paper, we report 1) development of EC magnetic configuration optimized for ECWC and 2) the recovery of wall condition from SPI shot in KSTAR. Initial EC magnetic configuration, so called, trapped particle configuration (TPC) was developed for EC assisted start up \cite{3}. This EC configuration offers a region where electrons could be trapped by a curved flux tubes. By expanding the flux tubes, plasma wetted area could be largely extended. After developing optimized TPC for ECWC, we have applied ECWC after each SPI shot. Plasma startup was reliable and stable, and achieved nearly 100 % success rate and reproducibility even in consecutive SPI use.

\cite{3} J. Lee et al., Nucl. Fusion, 57 (2017) 126033.