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Investigation on plasma properties of Magnetic X-point simulator system, MAXIMUS, with perturbing magnetic fields YEGEON LIM, BIN AHN, YONG SUNG YOU, YOUNG-CHUL GHIM, Korea Advanced Institute of Science and Technology — We present basic properties of low temperature DC plasmas generated in a recently built MAgnetic X-point sIMUlator System, MAXIMUS, a cylindrical multidipole chamber capable of generating tokamak-like poloidal magnetic fields. Steady-state low temperature DC plasmas with typical plasma parameters of T_e~1eV, n_e~$10^9 cm^{-3}$, and $_{--p}$~2V are generated by energetic ionizing electrons emitted from hot ThW filaments and/or an LaB_6 cathode plate. Plasma characteristics are measured with Langmuir probes, ion acoustic wave and optical emission spectroscopy with helium CR model, and magnetic field measurements using a Hall-effect sensor. Radial profiles of plasma parameters are mainly determined by the multidipole geometry, and axial profiles can be controlled by varying gas pressure, discharge voltage and current, and poloidal magnetic fields. With a magnetic X-point configuration, clear patterns on the plasma parameters are observed along magnetic field lines, especially on the separatrix region. We also present preliminary results on how the plasmas respond to additional perturbing magnetic fields.

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