

# Design and Analysis of Divertor Thomson Laser Beam Dump for KSTAR

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Thomson scattering (TS) is a standard diagnostic device for measuring an electron temperature and density profiles in the most of Tokamaks. For this reason, TS is one of the most important diagnostic system in KSTAR (Korea Superconducting Tokamak Advanced Research). In KSTAR, a tangential type TS system has been developed few years ago and measure the electron temperature and density profile at the plasma.

Recently, the divertor region has been replaced with tungsten (W) tiles to improve the performance of KSTAR plasma. Thus, we need to measure the electron temperature and density profile near the divertor region using TS. To install the divertor TS system, we have to design a laser guiding system, a collection optic system and a laser dump system which inside the KSTAR vacuum vessel.

In this poster, we will introduce the new beam dump system of the divertor TS in KSTAR. Already installed tangential TS system have a knife edge type beam dump which made of SUS316L inside the KSTAR[1]. Design of the divertor TS beam dump referred to the material and shape of tangential TS beam dump. TS signal is very week, and difficult to analysis because of a stray light inside the KSTAR vacuum vessel. So in order to properly measure a divertor TS signal, reducing the stray light is one of the most important issues[2], and the beam dump plays a key role in this case[3]. Thus, we designed the beam dump considering its installation location and incident angle of the TS laser beam. And then stray light sources of the beam dump system were simulated and analyzed.

We will show the design of KSTAR divertor Thomson beam dump system and discuss about the simulation and test result of divertor Thomson beam dump system.

[1] J.H.Lee et al., RSI. **81** (2010) 10D528.

[2] Shumei Xiao et al., RSI. **87** (2016) 073506.

[3] E. Yatsuka et al., RSI. **84** (2013) 103503.

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