

Statistical analysis of disruptions at COMPASS

E. Matveeva^{1,2}, J. Havlicek¹, A. Havránek¹, O. Hronova¹, V. Weinzettl¹, R. Pánek¹

¹ *Institute of Plasma Physics of the CAS, Prague, Czech Republic*

² *Charles University, Faculty of Mathematics and Physics, Prague, Czech Republic*

Understanding of disruptions plays an important role for design of the future fusion devices as they induce large thermal and mechanical loads on a vacuum vessel. Statistical analysis of the set of discharges during the period of August – December 2017 was performed in order to improve our knowledge of disruptions on COMPASS. About 25 % of COMPASS discharges are disruptive which provides a good opportunity of disruption studies. Disruption rate dependence on the operational limits (Greenwald limit, plasma current limit), auxiliary power and plasma current is investigated.

Asymmetrical disruptions are of particular concern because they induce additional currents and, therefore, forces in the vacuum vessel. In addition to this they might lead to a resonant amplification of the forces. The COMPASS tokamak is equipped with magnetic diagnostics, which allow measurements of the plasma current at five toroidal locations. This enables detailed investigation of asymmetrical disruptions (almost 80 % of disruptive discharges on COMPASS). It is observed that a plasma current asymmetry is detected for upward, downward and inward disruptions. However, rotation of asymmetry is never found during the upward disruptions. Asymmetrical disruptions parameters such as magnitude, frequency, number of rotations and duration of asymmetry are analysed within the contribution.