

Fast observations of post-disruption runaway electron beams at the COMPASS tokamak

V. Weinzettl¹, O. Ficker^{1,2}, J. Cavalier¹, M. Vlainic⁴, M. Imrisek^{1,3}, J. Mlynar¹, E. Macusova¹,
J. Cerovsky^{1,2}, M. Farnik^{1,2}, D. Naydenkova¹, P. Hacek¹, M. Hron¹, R. Panek¹ & the
EUROfusion MST1 Team*

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

² *FNSPE, Czech Technical University in Prague, Prague, Czech Republic*

³ *Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic*

⁴ *Institute of Physics, University of Belgrade, Belgrade, Serbia*

* *See the author list "H. Meyer et al., 2017 Nucl. Fusion 57 102014"*

Energetic electrons, which are foreseen to be produced during disruptions in ITER, represent a potentially dangerous threat for plasma facing components [1]. Therefore, behaviour of runaway electron (RE) beams has been studied at the COMPASS tokamak in the frame of dedicated experiments focused on their generation and subsequent mitigation [2], mainly using massive gas injection. In this contribution, we introduce fast observations of the generated RE beams done by different types of high-speed cameras, AXUV detectors as a proxy of fast bolometers, ECE and hard X-ray and photo-neutron detectors [3]. Time dependence and spatial localization of RE have been investigated with respect to several aspects: formation of the beam, with a special attention to observed filamentary and quiet phases of the beam existence; interaction of the beam with the background plasma as well as with the tokamak control system; beam extinction by slow decay or by sudden termination. Tomographic inversions have been applied to data measured by the mentioned diagnostics and have proven to be a valuable source of information about beam properties. A mutual relation between the electron energy and the parameters listed above has been investigated [4].

References

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