



June 1st 2020

Report on
Study of turbulence on the COMPASS tokamak using different diagnostic systems

Presented Jaroslav Krbec as PhD thesis

General comment

The manuscript presents an interesting investigation of plasma fluctuations using a variety of plasma diagnostics in the plasma boundary of fusion plasmas (COMPASS tokamak). Particularly relevant are the results on the characterization and physics of oscillating flows (GAMs) driven by turbulent mechanisms.

The research topics and the findings presented in the manuscript and related publications are relevant for the plasma physics community and the research work is fully acceptable (without reservations) as PhD thesis.

Questions and comments

There are some issues that would deserve further discussion with the candidate during the open discussion. In particular:

- 1. BES in COMPASS.** In order to optimize the BES diagnostic capabilities (particularly for fluctuations studies), it would be useful to clarify what is the extraction current of the Li-BES diagnostic in operation in COMPASS [Ref. RSI 2018]
- 2. Zonal Flows and transport control.** ZFs can regulate turbulent transport via two mechanisms: a) Reducing the turbulence correlation length b) ZFs constitute an energy sink for the turbulence and, as they do not contribute to radial transport, can cause a reduction of transport. Therefore, even if the shearing rate associated to GAM is marginal [as pointed out in NF 2017 and p. 16 & 18] GAM driven turbulent regulation is still feasible. Is there any evidence on the possible influence of GAMs on turbulent transport regulation in COMPASS?.
- 3. References.** One of the first direct experimental evidence of eddy tilting and breaking by the edge sheared flows was reported in TEXTOR tokamak by I. Shesterikov et al., Nucl. Fusion 52 042004 (2012) [p. 14].

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