Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **4015** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) (POS-11) Ion temperature measurement in the plasma edge of the STOR-M tokamak

Tuesday 20 June 2023 17:34 (2 minutes)

Reliable measurements of plasma parameters are a good way to confirm if the plasma dynamics fit well with our theoretical models as well as giving insight into the plasma's state. The ion temperature in the plasma cannot be measured from a typical Langmuir probe which makes it hard to estimate. To do so, it is possible to use a Ball-Pen probe (BPP) which has the ability to partially shield electrons thereby reducing the electron flux. By applying a varying voltage on the Ball-Pen probe, a symmetrical I-V curve can be obtained, allowing measurement of the ion temperature by curve fitting the exponential trend due to ionic thermal motion near the electron saturation region of the I-V curve. Other parameters such as the electron temperature, the electron density, the floating potential, and the plasma potential measured by the Ball-Pen probe in the STOR-M tokamak are compared with those obtained from a single Langmuir probe and a triple probe which are already established diagnostics in the STOR-M. It was found that the ion temperature in the plasma edge of the STOR-M is 7±3 eV, which is range comparable to what has been reported previously. More efforts would be needed to further validate ion temperature measurements in the STOR-M. Solutions include increasing the sweeping frequency of the power supply for better statistics as well as improving the mechanical setup of the probe.

Keyword-1

Plasma diagnostics

Keyword-2

Ball-Pen Probe

Keyword-3

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Session Classification: DPP Poster Session & Student Poster Competition (3) | Session d'affiches DPP et concours d'affiches étudiantes (3)

Track Classification: Technical Sessions / Sessions techniques: Plasma Physics / Physique des plasmas (DPP)