

Development of Capacitively Coupled Radio Frequency Discharge Plasma Device for the Validation of Supersonic Molecular Beam Diagnostics using Collisional-Radiative Model.

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Molecular beam diagnostics, such as helium beams, can be used to profile plasma density and temperature at the edge of the tokamak plasma [3]. A Supersonic Molecular Beam Injection (SMBI) system has been designed and validated for this purpose [1]. The interaction of the beam with the plasma can be studied using a dedicated high frequency capacitive discharge (CCRF) plasma system, in which other diagnostics such as Langmuir probe etc. can be used to validate the measured parameters. Estimation of plasma parameters using helium beam diagnostics is based on collisional radiative (CR) modelling of the spectroscopic emission resulting from the interaction of the SMB with the plasma [4]. A CCRF plasma is generated in a controlled environment using a 13.56 MHz RF source in a glass chamber and characterised using probes [2]. In this poster, an overview of the CCRF plasma system and the plans to integrate the SMBI into it are discussed.

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