Contribution ID: **101**   Type: **Short Talk**

Gas Puff Imaging at the Tokamak à Configuration Variable (TCV)

Wednesday, 23 October 2024 16:35 (10 minutes)

We present the design of the suite of Gas Puff Imaging (GPI) diagnostic systems on the Tokamak à Configuration Variable (TCV). These systems enable the study of Scrape-Off-Layer (SOL) turbulence in the tokamak, specifically focusing on the phenomenon of blobs. For the first time at TCV, we now have the capability to simultaneously collect poloidal 2D images of turbulence at several locations: the outboard midplane, around the magnetic X-point, in both the High-Field Side (HFS) and Low-Field Side (LFS) SOL, and in the divertor region. We characterize the innovative gas injection control systems for deuterium and helium, which have now become the default standard for all gas injections at TCV. This suite of diagnostics has driven several successful studies and the development of AI tools for the analysis of turbulence. These first results will be presented.

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Session Classification: Imaging

Track Classification: Imaging