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Correlation of VUV Duochromator and Bolometer Array Time Decay with Radial Impurity Transport Properties in Tore Supra

C. Bush, J. Hogan, ORNL, C. DeMichelis, M. Mattioli, P. Monier-Garbet, J.C. Vallet, CEA-Cadarache – Poloidal profiles obtained with the Tore Supra grazing incidence duochromator have been modeled in an attempt to attempt to infer transient radial transport characteristics from them. The poloidal profiles are complex, especially during ergodic divertor operation, since the instrument is co-located in a port with a poloidal guard limiter. Thus the contribution of local neon recycling from the guard limiter to the measured duochromator signal has been modeled using the BBQ impurity scrape-off layer code (asymmetric contribution) along with MIST simulation of core transport (symmetric contribution). A good correspondence is found between decay of the duochromator signal and the inferred core transport, when the BBQ simulated signal for limiter recycling is accounted for. The transient decay (after a short neon puff) of the duochromator and a horizontally viewing bolometer are also well correlated, suggesting potential use of poloidal duochromator signals to extract radial impurity transport information. An important caveat, however, is that the signals are sensitive to details of the Te profile in the edge region where this is not well measured.

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