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# Fast tomography for the control of the emitted radiation in tokamaks.

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Accurate measurement and control of the radiation emitted by tokamak plasmas is crucial for the successful operation of fusion reactors. Many macroscopic plasma instabilities, which can rapidly yield to lost of plasma confinement, are related to radiation patterns differing in localisation, shape and intensity. Current tokamaks use bolometers to measure the plasma emission, but they only provide line-integrated values and require an inversion technique for obtaining local information. Tomography inversion is a commonly used approach for high spatial resolution reconstructions, but it is slow and unsuitable for real-time applications. In this work, a fast inversion technique, that provides a low spatial but high time resolution is presented. The reliability of the method is demonstrated by analysing numerical generated patterns and the accuracy is evaluated for different shapes and positions of the emitted regions. Further validation of the method is offered by comparison with a well established tomography reconstruction on different discharges of JET with the ITER Like Wall. Finally, an analysis of the main radiation patterns is performed with this developed method in order to understand the mechanism, which can lead to the radition collapse of the configuration. The results suggest that the fast inversion technique is a promising tool for real-time radiation monitoring and control in fusion reactors.

## Speaker's Affiliation

University of Rome " Tor Vergata", Rome

## Member State or IGO/NGO

Italy

**Authors:** Dr MURARI, Andrea (Consorzio RFX (CNR, ENEA, INFN, Università di Padova, Acciaierie Venete SpA), Corso Stati Uniti 4, 35127 Padova, Italy); PELUSO, Emmanuele (University of Rome Tor Vergata); WYSS, Ivan (Università degli studi di Roma Tor Vergata); GELFUSA, Michela (University of Rome Tor Vergata); GAUDIO, Pasquale (University of Rome Tor Vergata); ROSSI, Riccardo (Department of Industrial Engineering, University of Rome Tor Vergata); AND JET CONTRIBUTORS* (EUROfusion)

**Presenter:** WYSS, Ivan (Università degli studi di Roma Tor Vergata)

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