Spectroscopic Imaging of liquid Tin as plasma facing material on ISTTOK

J. Loureiro, H. Fernandes, C. Silva, R. Gomes, T. Pereira,

Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico, Universidade de Lisboa, 1049-001 Lisboa, Portugal

One of the main unsolved issues in nuclear fusion is related to the high power loads impinging on the first wall of fusion reactors. Liquid metals, such as lithium, gallium or tin, as plasma facing material have been pointed out as possible alternative to the solid walls option. However, the use of these materials in fusion reactors depends, among others things, on the discharge performance degradation induced by the enhanced impurity contamination.

The impurity content across ISTTOK plasma column (radially and toroidally) will be characterized by spectroscopic measurements of the Sn I and Sn II lines in the visible range. In this poster we present the multi-chord setup developed for that purpose. This will include: (i) a variable amplification (10 to 20 times) optical system, which will focus light onto (ii) a 10 x 0.625μm silica fibers bundle, which, in turn, will convey light to a (iii) spectrometer where the achieved spectra will be recorded by a scientific EMCCD camera.