



Contribution ID: 30

Type: Poster

## Optimisation of the input polarisation angle on lines of sights of a polarimetry system for a fusion reactor

*Thursday, 4 October 2018 14:30 (1h 30m)*

The study is dedicated to the evaluation of the effects of the input polarisation angle with the respect to the toroidal magnetic field on the values of the Faraday Rotation, Cotton-Mouton phase shift angle (and then ellipticity). The need of this evaluation is connected to the optimisation of the polarimetry quantities in view of having a complete information related to magnetic fields, plasma density and electron temperature. A polarimeter with four vertical as well as four horizontal lines of sights at various angle with respect to the equatorial axis is considered. The equilibrium used is a circular analytic model which considers a tokamak in the slab approximation. The plasma parameters considered are  $B_t=5T$  (toroidal magnetic field),  $I_p=10MA$  (plasma current), plasma density  $n_e=10^{20}m^{-3}$ ,  $R=9m$  (major radius),  $R/a=3.5$  (aspect ratio). The scenarios considered are H-mode baseline and optimised shear with slightly reversed shear current profile. The input polarisation angle is varied between  $0deg$  and  $45deg$ . It is found that the polarimetry signals of horizontal lines of sights are very sensible to the polarisation input angle leading to the strengthening the possibility of measuring the plasma density and electron temperature in these lines.

### Summary

**Primary author:** Dr ORSITTO, francesco paolo (CREATE Consortium and ENEA Frascati)

**Co-author:** Dr CHRZANOWSKI, J. (Maritime University of Szczecin, Szczecin, Poland)

**Presenters:** Dr CHRZANOWSKI, J. (Maritime University of Szczecin, Szczecin, Poland); Dr ORSITTO, francesco paolo (CREATE Consortium and ENEA Frascati)

**Session Classification:** POSTER SESSION