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## Analysis of JET Polarimeter Lateral Chords with a dedicated Propagation Code

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Internal magnetic measurements are essential to obtain reliable and accurate magnetic reconstructions in the interior of the plasma column in Tokamaks. In the last years, polarimetry has been increasingly used to provide global constraints to equilibrium codes. JET polarimeter1 has four vertical and four lateral chords, whose arrangement is similar to the topology of the diagnostic foreseen in ITER. Analysis of JET polarimetry measurements were carried out for vertical chords using a polarimetry propagation code based on Stokes vector formalism2. A new propagation code has been developed therefore for lateral chords to simulate and interpret the measurements of the Faraday rotation and Cotton-mouton phase shift in JET. After proper benchmarking with experimental measurements, the code has been used to study the effect of the input polarisation on the quality of the measurements. The results allow to choose the best polarisation to optimise the polarimetric measurements for the various experiments. Polarimetry can also be used to complement the density measurements of interferometry (and of the other diagnostics providing the electron density). Therefore an analysis of the various approximations to obtain the line integrated density from the Faraday angle/Cotton Mouton Phase shift have also been performed.

[1] Braithwaite G. , N Gottardi, G Magyar, J O'Rourke, J Ryan and D Veron, Rev Sci Instrum 60(1989) 2825

[2] F P Orsitto, A Boboc, P Gaudio, M Gelfusa, E Giovannozzi, C Mazzotta, A Murari and JET EFDA Contributors , Plasma Phys Contr Fusion 53(2011) 035001

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