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TWO APPROACHES TO PLASMA POLARIMETRY: ANGULAR VARIABLES TECHNIQUE (AVT) AND STOKES VECTOR FORMALISM (SVF)

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The modern plasma polarimetry is based on Stokes vector formalism (SVF) suggested and developed in depth by Segre (see [1] and cited there references). Segre's equations describe evolution of the Stokes vector along the ray in the weakly inhomogeneous and weakly anisotropic plasma. Alternative approach –Angular Variables technique (AVT) suggested by Czyż, Bieg, Kravtsov [2] in distinction to SVF, deals with angular parameters of the polarization ellipse. Equations for angular parameters drastically differ from the SVF equations, however, AVT and SVF equations happen to be equivalent to each other.

This paper proves equivalence of the SVF and AVT and in the sometime reveals some practical distinctions between two approaches. Though all the results of SVF can be obtained in frame of the AVT and vice versa, in specific problems one of the methods can be more convenient. Generally, AVT may serve as a valuable compliment to traditional SVF, providing sometimes more simple an less laborious solution of polarimetric problems.

1. S. E. Segre, J. Opt. Soc. Am. A 18, 2601 (2001)
2. Z. Czyż, B. Bieg, Yu.A. Kravtsov, Phys. Lett. A 368, 101 (2007)

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