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Problems in Polarization Metrology

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Abstract: Polarization metrology is gaining increased importance as polarized light is recently involved in different branches of science and technology. This paper summarizes the contributions of the optical polarization laboratory at the National Institute for standards (NIS, Egypt) during the last 25 years. These include introducing a new class of total internal reflection phase retarders, modifying the Senarmont method to allow for simultaneous calibration of two phase plates at any wavelength, birefringence measurements, applications of the Poincaré sphere, calibration and adjustment of polarization elements and measurements of the optical constants of conductors.

Keywords: Polarization metrology; Phase retardation elements; Calibration methods; Adjustments of elements; Optical constants