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Thesis: **"POLARIZATION EFFECTS GENERATED THROUGH THE SCATTERING OF LIGHT BY METALLIC CYLINDERS"**

Summary:

In this work, the effects of the interaction between a thin metallic cylinder and a polarized optical field on the generation of both, unconventional and conventional polarization states are presented. In the first study, two different kinds of cylinders under conical incidence were analyzed: the first one was covered by a thin film of silver, which was done with the objective of improving the quality of the scattered light and reducing the possible effects of the scattering on the results in relationship with roughness on the surface; the second one was a nickel cylinder (an electric guitar string) chosen with the intention of proving that the method of generation is capable of giving good results without a well-defined surface and with a different diameter. The interactions of the lineal horizontal and vertical polarization states with the cylinders were measured around 360º, using a conical geometry of illumination, yielding azimuthal and radial polarization states as a resultant. The study of the scattered light after the cylinder leads to the application of the cylinder as a generator of unconventional polarization. For the second study case, the cylinder was placed in the same system but with a different geometric configuration, under a plane geometry of incidence. The nickel cylinder was studied through the complete set of the six basic spatially homogeneous polarization states; the results obtained from the interaction between the cylinder and the polarization states show that the cylinder can be used as a wave retarder plate resolved angularly. The polarimetric analysis of this phenomenon provides new and original information and increases possible applications of the cylinder not only as a generator of unconventional states, but also as a wave retarder plate.