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OPTICAL GLORY AND ITS POLARIZATION

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Abstract*: Two of the most fascinating effects of the scattering of light by atmospheric particles (rain drops, clouds, etc.) whose size is much larger than the wavelengths of the radiation in the visible spectrum, are the rainbow and the glory. The rainbow is readily observed in nature but the optical glory is much less frequently observed phenomenon. Geometrical optics explains rainbows only in the sense that it predicts singularities for scattering in certain directions (rainbow angles), i.e. the angles of intense scattering, not the amount. Geometrical optics also predicts a singularity in the backward direction, i.e. the existence of the glory, but no more. Because geometrical optics and van de Hulstian theory (see later on) are incapable or inaccurate in treating the polarization of the glory (which is extremely unusual), in this paper, with the help of the Khare-Nussenzveig (KN) theory, we investigate the dependence of his degree of polarization on the scattering angle for the water droplets (N=1,333) with the radius* $a \cong 25{,}5\lambda$.