# Polarization of Thomson-Scattered Radiation from an Aspherical Disk

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We compute the polarization of the emergent radiation from an aspherical disk, which is expected, for example, in an advection dominated accretion flow. We adopt a simplified density distribution given by $n \propto r^{-3/2}(a_0 + a_2 \cos^2\theta)^2$, and investigate the dependence of the polarization of the Thomson-scattered radiation on the anisotropy of the density distribution and the scattering optical depth. Assuming that the photons are generated inside the disk with the dependence of n2, we find that the emergent radiation is polarized with a degree of 0.1 per cent in the direction parallel to the disk normal axis in the case of $\tau = 0.1$ and a0 = 0, and that the degree of polarization increases to 1 per cent when $\tau$ approaches 1. We extend our computation to disks with moderate optical depths up to $\tau \sim 10$ and find that the degree of polarization approaches the limit of 5 per cent. A brief discussion of our results is presented.