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A numerical approach to the Klein-Nishina corrections of radiative cooling in relativistic outflows JESS RUEDA-BECERRIL, Rochester Institute of Technology — In relativistic outflows like those seen in blazars, GRBs or PWNe, it is highly probable that ultrarelativistic particles interact with photons in their environment through scattering, known as inverse Compton. The classical regime of such scattering is known as the Thomson regime, characterized for efficiently cooling particles. If the energy of the charged particle is smaller than the energy of the interacting photon, the scattering process enters into the so-called Klein-Nishina (KN) regime. Thomson regime cooling predicts a soft high-energy end of particle energy distributions. However, observations have dropped that some sources show hard spectral indices at high frequencies. This has led to think that maybe particles are not being cooled down efficiently. Asymptotic approximations of the Klein-Nishina regime have been formulated in the last decades in order to account for these corrections in the distribution of particles responsible for the observed spectrum of high energy sources. In this work we present a numerical approach of the KN corrections to particle radiative cooling, and apply it to astrophysical scenarios like GRBs. We show the observational implications by showing the multi-wavelength spectra and light curves of these objects.

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