

Gamma-ray emission from pulsar magnetospheres

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We consider particle acceleration and radiation in the polar cap model of pulsar high energy emission. We assume that particles leaving the acceleration region have obtained a power-law spectrum due to secondary pair production and we solve a kinetic equation which includes losses by curvature radiation to model the evolution of their distribution function as they coast along the open field lines. We then calculate self-consistently the radiated spectrum and we compare it with the observations of the known gamma-ray pulsars. This analytic approach allows us to draw conclusions on the properties of the electromagnetic cascade at the base of the radiation zone.