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# The gamma—ray signal from core—collapse supernovae.

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The shock wave resulting from the core-collapse of a massive star can accelerate particles up to PeV energies in the first few days to weeks after explosion. This can lead to the production of a potentially detectable gamma—ray signal. The gamma-ray flux however is strongly affected by the two photon—annihilation process, where gamma—ray photons interact with photons from the SN photosphere. It is therefore not surprising that there has been no confirmed detection of gamma-rays from core-collapse supernovae at very high energies.

In order to probe the detectability of the gamma-rays with current and upcoming gamma-ray observatories, we estimate the gamma—ray flux from typical type IIp core collapse supernovae (CCSNe). These are the most common type of supernovae, and are presumed to arise from red supergiant progenitors. We include a detailed time-dependent calculation of two—photon absorption. Our results will be very useful in creating a strategic observing program to detect CCSNe with the next generation gamma—ray observatory, such as the Cherenkov Telescope Array (CTA).

## Keywords

supernova; cosmic ray; gamma–ray astronomy, gamma rays; particle acceleration

## Collaboration

## other Collaboration

## Subcategory

Theoretical Results

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