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Investigating Shock Acceleration Physics in SN1006

SN1006 is a characteristic supernova remnant exhibiting a bilateral shape, with non-thermal X-ray and TeV emission more prominent in two polar cap regions aligned with the ambient magnetic field. Further, a large scale gradient in ambient density is observed in a direction roughly perpendicular to the magnetic axis.

We model the radio to gamma-ray spectrum of SN1006 using a self-consistent, semi-analytical model of particle acceleration applied to four different quadrants, which show different spectral signatures. Such a space-resolved analysis of SN1006 allows us to assess how the non-thermal emission depends on the shock inclination and how the hadronic/leptonic nature of the gamma-ray emission depends on the ambient density.

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