

論文内容の要旨

論文題目 Search for TeV Gamma-ray Emission from the Supernova
Remnant W44 with the CANGAROO-III telescopes

(CANGAROO-III望遠鏡による超新星残骸 W44からのTeVガンマ線放射の探索)

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Supernova Remnants (SNR) are believed to be proton accelerator up to *knee* ($\sim 10^{15}$ eV) regions, and the supernova rate and efficiency of diffusive shock acceleration can account for the abundance of uniform cosmic-ray protons. Motivated by this idea, many studies of SNRs have been done. Although some of known TeV SNRs are expected to be hadronic sources, electronic origin is not ruled out.

In this theses, we will pick up SNR W44, which belongs to the mixed-morphology SNR class and is linked to the interaction with dense molecular clouds as well as W28 and IC 443, in which recently very high energy gamma-ray signals were reported.

The coincidence of gamma-ray signals and molecular clouds is thought to be a feature of proton acceleration.

A mixed-morphology supernova remnant W44 was observed by the CANGAROO-III telescopes 25 hours in 2005 Jun and July. After standard analysis procedure, we obtained no significant gamma-ray excess but integral flux 2σ upper limit at 1.1 TeV. Based on this result, multi-wavelength spectral analysis and energetics are studied, considering both leptonic and hadronic models.