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The energy spectra of distant metagalactic sources: 1739+522 and 3c454.3

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Abstract content

The understanding of mechanisms in active galactic nuclei requires the detection of a large sample of very high energy gamma-ray objects at varying redshifts. The gamma-astronomical researches are carrying out with SHALON mirror telescope at the Tien-Shan high-mountain observatory since 1992. The redshifts of SHALON very high energy gamma-ray sources range from z=0.0183 to z=1.375. The most distant object 1739+522 (with redshift z=1.375), seen in TeV energy, is also the most powerful: its integral gamma-ray flux is found to be $(0.5 \pm 0.10) \times 10^{-12} cm^{-2} s^{-1} atenergiesof > 0.8 TeV. Theintegralgamma-rayfluxof 3c454 (z = 0.859) wasestimatedas (0.43\pm0.13)\times10^{-12}$ cm^{-2}s^{-1}. It is consistent with the upper limit $0.84 \times 10^{-11} cm^{-2} s^{-1}$ obtained by Whipple telescope at energy more than 0.5 TeV. The gamma-ray spectra and fluxes of known blazars Mkn421, Mkn501 as the spectrum of NGC1275 and distant flat-spectrum radio quasars 1739+522 and 3c454.3 are presented: for:NGC 1275(z=0.0183) kγ=-2.26\pm0.10, kon=-2.05\pm0.10, koff=-1.75\pm0.08; for: Mkn 421 (z=0.031) kγ=-1.53\pm0.41, kon=-1.46\pm0.06, koff=-1.75\pm0.06; for: Mkn 501 (z=0.034) kγ=-1.89\pm0.11, kon=-1.83\pm0.06, koff=-1.72\pm0.06; for: 3c454.3 (z=0.859) kγ=-0.95\pm0.10, kon=-1.03\pm0.06, koff=-1.71\pm0.06; for:1739+522 (z=1.375) kγ=-1.09\pm0.06, kon=-1.12\pm0.06, koff=-1.75\pm0.05. So, the energy spectrum of metagalactic sources Mkn421, Mkn501, NGC 1275 at range $10^{12} - 10^{13}$ eV differs from spectra of distant quasars 1739+522 and 3c454.3 that don't contradict to united energy spectrum F(>Eγ) ~ Eγ-1.2pm0.1. The most distant currently known source 1739+522 is about 10^{11} times more powerful than the full emission from all known sources of the Galaxy. Thus, the modern gamma-astronomical observations put forward the question: what mechanisms might be responsible for the currently observed gamma-ray fluxes from the remote metagalactic sources?

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 3 (OG part 2), pages 877-880

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