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Galactic sources at TeV energy: Flaring activity of Cygnus X-3 and new binary 2129+47XR

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Abstract content

The new galactic gamma-source neutron star 2129+47XR is detected at energy >0.8TeV with flux $(0.19\pm0.9)\times10^{-12}\cm^{-2}\s^{-1}$ and index of the integral spectrum is $k\gamma = -1.05\pm0.10$. Cygnus X-3 is peculiar X-ray binary system discovered about 40 years ago. The system has been observed throughout wide range of the electromagnetic spectrum. It is one of the brightest Galactic X-ray sources, displaying high and low states and rapid variability in X-rays. It is also the strongest radio source among X-ray binaries and shows both huge radio outbursts and relativistic jets. The radio activity is closely linked with the X-ray emission and the different X-ray states. Based on the detections of ultra high energy gamma-rays, Cygnus X-3 has been proposed to be one of the most powerful sources of charged cosmic ray particles in the Galaxy. The attempts of detection of TeV emission from Cygnus X-3 were first made in the mid of 1970s and continued through the mid 1980s. Two observations were particularly important: the Kiel results and contemporaneous observation at Haverah Park. These results indicated a very large UHE flux from Cygnus X-3. The 10 year's observation results of point source Cygnus X-3 by mirror Cherenkov telescope SHALON are presented. Cygnus X-3 has been regularly observed since a 1995 with average gamma-quantum flux of $F(EO>0,8 \text{ TeV})=(6.8 \text{pm}0.7) \times 10^{-13} \text{cm}^{-2} \text{s}^{-1}$. The energy spectrum of Cygnus X-3 at 0.8 - 65 TeV F(>E_0) ~ E^{k\gamma}, where $k\gamma = -1.22$ with flux on the order the less than upper limits published before. The flux in 2003 year is $(1.79\pm0.33)\times10^{-12}cm^{-2}s^{-1}$. The index of integral spectrum is $\chi = -1.28\pm0.06$. Earlier, in 1997, the increase of flux was also observed $(1.2 \text{pm}0.5) \text{times}10^{-12} \text{cm}^{-2} \text{s}^{-1}$. Thus, among ten observable gamma-quantum objects, there is galactic source Cygnus X-3, with periodic change of intensity. The variability of radiation can give essential information on a source nature. The binary Cyg X-3 came to new period of flaring activity at radio- and X-ray energies in 2006. In May and July 2006 the significant increase of Cyg X-3 flux have detected with SHALON at TeV energy.

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.);

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