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TeV emission from NGC1275 viewed by SHALON 15 year observations

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Galaxy clusters have been consider as sources of TeV gamma-rays emitted by high-energy protons and electrons accelerated by large scale structure formation shocks, galactic winds, or active galactic nuclei. The Perseus cluster of galaxies is one of the best studied clusters due to its proximity and its brightness. Galaxy NGC 1275 is the central dominant galaxy of the Perseus Cluster of Galaxies and is of Seyfert galaxy class. NGC 1275 is known as powerful X-ray and radio source. Many studies explored correlations of X-ray radio optical and ultraviolet emission.

In 1996 year a new metagalactic source was detected by SHALON at TeV energies. This object was identified with Seyfert galaxy NGC 1275 (with redshift z=0.0179); its image is presented. The maxima of the TeV gamma -ray, X-ray and radio emission coincide with the active nucleus of NGC 1275. In contrast, the X-ray and TeV emission disappears almost completely in the vicinity of the radio lobes. The correlation TeV with X-ray emitting regions was found whereas the integral gamma -ray flux for this source is found to be $(0.78 \pm 0.13) \times 10^{-12} cm^{-2} s^{-1}$ at energies of > 0.8 TeV. The energy spectrum of NGC 1275 at 0.8 to 40 TeV can be approximated by the power law $F(> E_O) \propto E^k$, with $k = -2.25 \pm 0.10$. The Seyfert galaxy NGC 1275 has been also observed with the Tibet Array (about 5 TeV) and then with Veritas telescope at energies about 300 GeV at 2009. The recent detection by the Fermi LAT of high-energy gamma-rays from the radio galaxy NGC 1275 makes the observation of the very high energy (E > 100 GeV) part of its broadband spectrum particularly interesting. The overall spectral energy distribution of NGC 1275 from the low energies to the TeV energies is presented. The spectrum of NGC 1275 from SHALON 15 year observations is also shown. The search for gamma-rays from radio galaxies is important for the understanding of the dynamics and structure of active galactic nuclei.

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