Proceedings of ICRC 2001: 2574 © Copernicus Gesellschaft 2001

ICRC 2001

Search for point sources of primary gamma rays above 10 TeV with an air shower array at Mt. Chacaltaya

H. Yoshii[1], F. Kakimoto[2], S. Ogio[2], N. Tajima[3], O. Burgoa[2], E. Gotoh[3,*], D. Harada[2], K. Kadota[4], T. Kaneko[5,*], Y. Kurashina[2], Y. Kuwata[1], Y. Matsubara[6], P. Miranda[7], Y. Mizumoto[8], T. Morihisa[2], A. Morizawa[1], K. Murakami[9], S. Nakamitsu[1], H. Nakatani[3,*], K. Nishi[3,*], K. Okamoto[1], S. Shimoda[3], Y. Shirasaki[10], M. Teshima[11], H. Tokunou[2], Y. Toyoda[12], Y. Tsunesada[2], A. Velarde[7], and Y. Yamada[3]

[1]Department of Physics, Ehime University, Ehime 790-8577, Japan
[2]Department of Physics, Tokyo Institute of Technology, Tokyo 152-8551, Japan
[3]Institute of Physical and Chemical Research, Saitama 351-0198, Japan
[4]Faculty of Engineering, Musashi Institute of Technology, Tokyo 158-8557, Japan
[5]Department of Physics, Okayama University, Okayama 700-8530, Japan
[6]Solar-Terrestrial Environment Laboratory, Nagoya University, Aichi 464-8601, Japan
[7]Instituto de Investigaciones Fisicas, Universidad Mayor de San Andres, La Paz, Bolivia
[8]National Astronomical Observatory, Tokyo 181-8588,Japan
[9]Nagoya University of Foreign Studies, Nissin, Aichi 470-0197, Japan
[10]Tsukuba Space Center, National Space Development Agency of Japan, Ibaraki 305-8505, Japan
[11]Institute for Cosmic Ray Research, University of Tokyo, Kashiwa 277-8582, Japan
[12]Department of Physics, Kobe University, Hyogo 457-8501, Japan
[*]retired

Abstract. Several point sources of primary gamma rays below 10TeV have been observed with atmospheric Cherenkov telescopes. At present, it is concluded that these gamma rays are produced via the synchrotron and the inverse Compton processes. On the other hand, in order to study the origin of cosmic rays with nuclear components, it is crucially important to search for point and diffuse sources of primary gamma rays above 10TeV as decay products of secondary neutral pions. For this purpose, we improved an air shower array at Mt. Chacaltaya by adding twelve $4\mathrm{m}^2$ scintillation detectors in 1996 and twenty-one $1\mathrm{m}^2$ ones in 1998 to reduce the threshold energy to 6TeV to old array(threshold energy, 30TeV). Since the exposure is less than one year yet, we did not find any significant source up to now. Then we will report the upper limits of primary gamma ray fluxes for several attractive sources such as Crab nebula, Vela pulsar, Sco X-1 and so on.

Correspondence to: Yoshii (yoshii@sci.sci.ehime-u.ac.jp)