

A SEARCH FOR 20÷100 TEV γ -RAYS FROM THE CRAB NEBULA WITH 10 YEARS OF EAS-TOP DATA

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The full dataset (1989-2000) of the EAS-TOP scintillator array has been exploited to search for γ -ray emission from the Crab Nebula at primary energies exceeding the typical ones of Cherenkov light detectors.

Different selection criteria have been applied to the data in order to select two primary energies, i.e., $E_1 = 22$ TeV and $E_2 = 105$ TeV.

The total ON-source time is 12925 hours, and the number of ON-source events are $N_1 = 1.2 \cdot 10^7$ and $N_2 = 1.3 \cdot 10^5$ (in angular windows $\Delta\Omega_1 \approx 2 \cdot 10^{-2}$ sr and $\Delta\Omega_2 \approx 3 \cdot 10^{-3}$ sr, respectively).

No D.C. emission has been detected: the 90% c.l. integral flux limit above 22 TeV is $2.5 \cdot 10^{-13} \text{cm}^{-2} \text{s}^{-1}$, and above 105 TeV is $3.9 \cdot 10^{-14} \text{cm}^{-2} \text{s}^{-1}$. Using a power-law index of the Crab energy differential spectrum $\gamma = 2.5$ (as reported by Cherenkov light detectors), the obtained 90% c.l. differential flux limits are: $\frac{d\Phi}{dE} < 1.7 \cdot 10^{-14} \text{cm}^{-2} \text{s}^{-1} \text{TeV}^{-1}$, at 22 TeV, and $\frac{d\Phi}{dE} < 6.9 \cdot 10^{-16} \text{cm}^{-2} \text{s}^{-1} \text{TeV}^{-1}$, at 105 TeV.