"Universe viewed in Gamma-rays" S11 : Sep.26 2002, Kashiwa, Japan

Tibet AS γ Collaboration

Recent Status of the Tibet AS γ Experiment

HOTTA Naoki

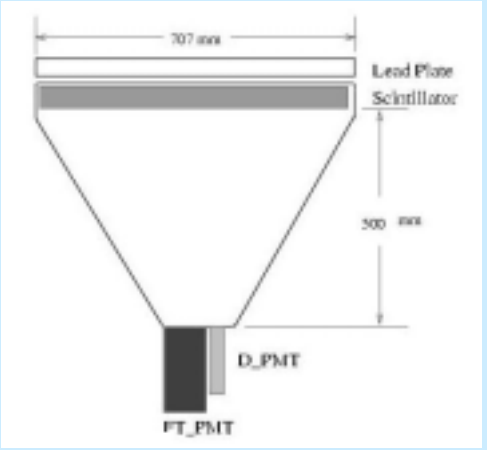
Utsunomiya University

Tibet AS γ Collaboration

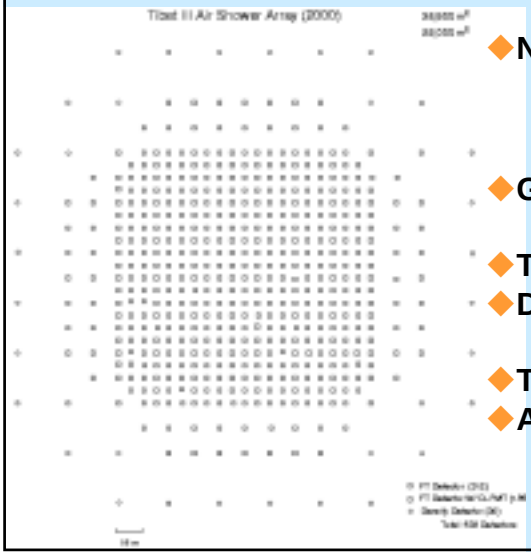
M.Amenomori, S.Ayabe, S.H.Cui,
L.K.Ding, X.H.Ding, C.F.Feng, Z.Y.Feng, Y.Fu,
X.Y.Gao, Q.X.Geng, H.W.Guo, M.He, K.Hibino, N.Hotta, J.Huang,
Q.Huang, A.X.Huo, K.Izu, H.Y.Jia, F.Kajino, K.Kasahara, Y.Katayose,
K.Kawata, Labaciren, G.M.Le, J.Y.Li, H.Lu, S.L.Lu, G.X.Luo, X.R.Meng,
K.Mizutani, J.Mu, H.Nanjo, M.Nishizawa, M.Ohnishi, I.Ohta, T.Ouchi, S.Ozawa,
J.R.Ren, T.Saito, M.Sakata, T.Sasaki, M.Shibata, A.Shiomi, T.Shirai, H.Sugimoto,
K.Taira, M.Takita, Y.H.Tan, N.Tateyama, S.Torii, H.Tsuchiya, S.Udo, T.Utsugi,
C.R.Wang, H.Wang, X.Wang, X.M.Xu, L.Xue, X.C.Yang, Y.Yamamoto,
Z.H.Ye, G.C.Yu, A.F.Yuan, T.Yuda, H.M.Zhang, J.L.Zhang,
N.J.Zhang, X.Y.Zhang, Zhaxiciren and Zhaxisangzhu

Tibet Air Shower Array

Located at Yangbajing in Tibet : Altitude **4,300 m**
Latitude : **30.11° N** Longitude : 90.53° E

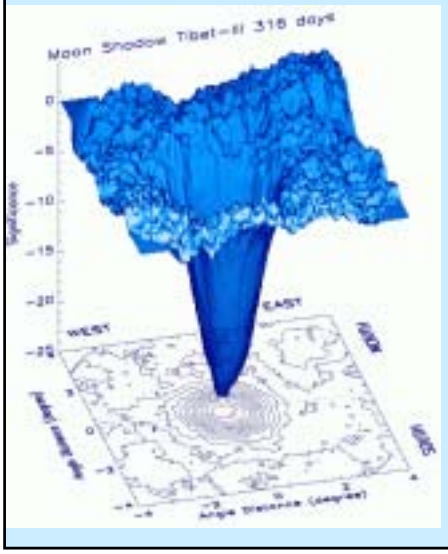


Tibet Air Shower Array



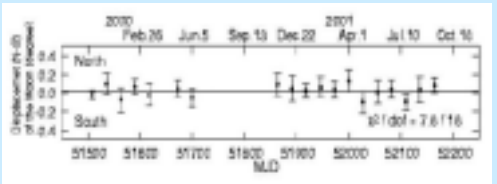
- Number of detectors : 533
  - Fast Timing(FT) Detector 312
  - FT with Density-PMT 185
  - Density Detector 36
- Grid spacing : 7.5m
- Trigger Rate : 680Hz
- Dead Time : 7.0%
- Threshold Energy : ~ 3 TeV
- Angular Resolution :~0.9deg

Pointing Accuracy



Moon's shadow in Cosmic Rays
North-South Displacement
(geomagnetic field free):

Pointing Accuracy < 0.1 deg



At present

- Unpulsed ; Crab
- Flare ; Mrk501, Mrk421
- Search for unknown gamma-ray sources

  ⇒ Poster session S30, M.Sakata

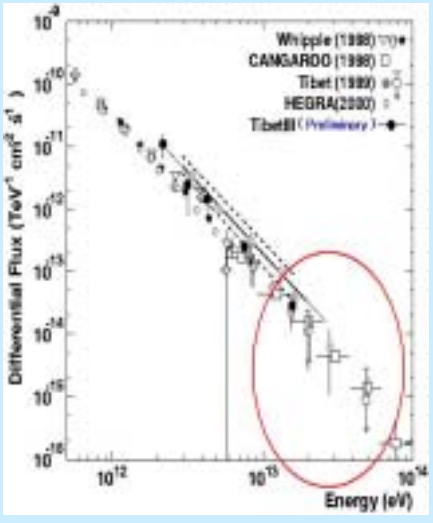
"A wide sky survey for flare type TeV gamma-ray sources using the Tibet-HD data"

- Diffuse gamma-rays from Galactic plane

  ⇒ Poster session S33, Y.Yamamoto

"Upper Limits of Diffuse Gamma Rays from the Galactic Plane at 10 TeV with the Tibet-II and Tibet-III Array"

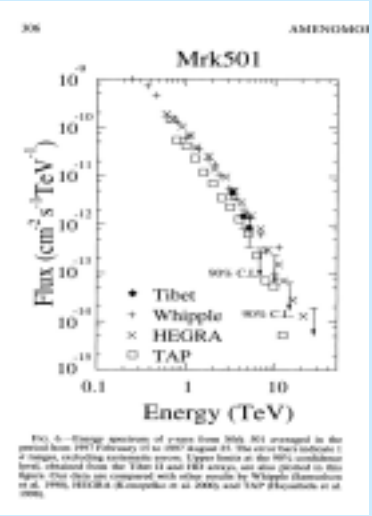
Crab (unpulsed)

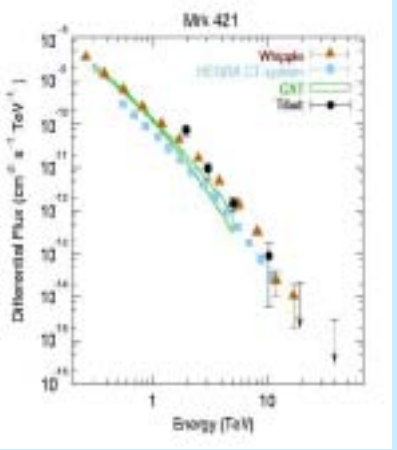


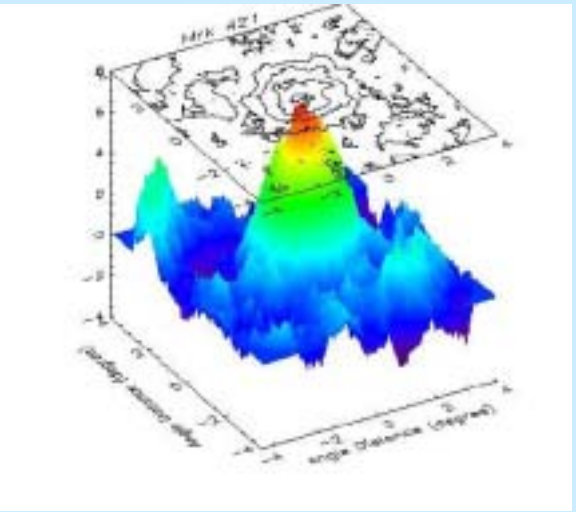
Where is a cutoff ?

Can we see the protons signal ?

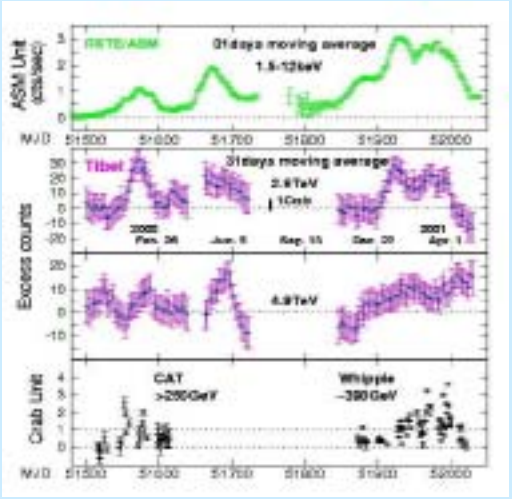
Mrk501 and Mrk421 (flare)





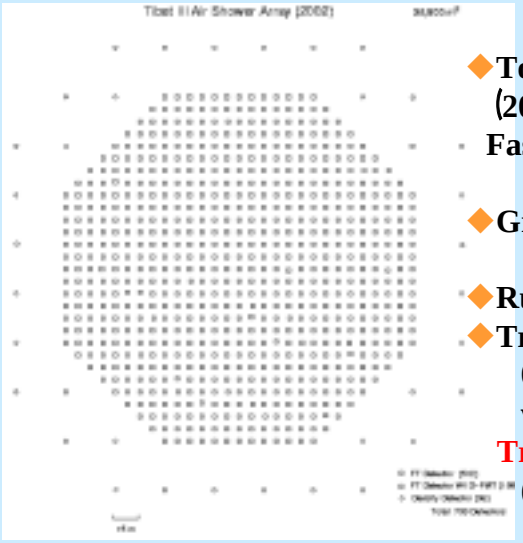


Mrk421 (time variation)



Correlation between X-rays and TeV gamma-rays

Tibet III (Nov. 2002~)



- **Total covering area : 36,900m^2**
  (200 FT detectors will be added)
  Fast Timing(FT) detectors : 697
  Total : 733
- **Grid spacing : 7.5m**
- **Run will start from Nov. 2002.**
- **Trigger condition :**
  0.7particles Any 4 detectors with in 300ns
  Trigger rate : ~1kHz
  (data : ~60GB/day)

Conclusion

We are enlarging the Tibet III array now,
and it will be operated from November 2002.

⇒ Sensitivity ; ~3 times higher than Tibet HD
・Threshold Energy ~3TeV ・Angular resolution <0.9deg

- Crab nebula ; up to 100 TeV region with high accuracy
- Gamma ray sources ; such as SNRs and AGNs
- Survey of the wide sky ; unknown high-energy gamma-ray sources
- Transient objects ; coincident with satellite, GLAST etc.