

Observation of intense fluxes of charged particles in association with thundercloud in Tibet

M. Amenomori¹, X. J. Bi², D. Chen³, T. L. Chen⁴, W. Y. Chen², S. W. Cui⁵,
Danzengluobu⁴, L. K. Ding², C. F. Feng⁶, Zhaoyang Feng², Z. Y. Feng⁷, Q. B. Gou²,
Y. Q. Guo², H. H. He², Z. T. He⁵, K. Hibino⁸, N. Hotta⁹, Haibing Hu⁴, H. B. Hu²,
J. Huang², H. Y. Jia⁷, L. Jiang², F. Kajino¹⁰, K. Kasahara¹¹, Y. Katayose¹², C. Kato¹³,
K. Kawata¹⁴, M. Kozai¹³, Labaciren⁴, G. M. Le¹⁵, A. F. Li^{16,6,2}, H. J. Li⁴, W. J. Li^{2,7},
C. Liu², J. S. Liu², M. Y. Liu⁴, H. Lu², X. R. Meng⁴, T. Miyazaki¹³, K. Mizutani^{11,17},
K. Munakata¹³, T. Nakajima¹³, Y. Nakamura¹³, H. Nanjo¹, M. Nishizawa²⁰, T. Niwa¹³,
M. Ohnishi¹⁴, I. Ohta¹⁹, S. Ozawa¹¹, X. L. Qian^{6,2}, X. B. Qu², T. Saito²¹, T. Y. Saito²²,
M. Sakata¹⁰, T. K. Sako¹⁴, J. Shao^{2,6}, M. Shibata¹², A. Shiomi²³, T. Shirai⁸,
H. Sugimoto²⁴, M. Takita¹⁴, Y. H. Tan², N. Tateyama⁸, S. Torii¹¹, H. Tsuchiya²⁵,
S. Udo⁸, H. Wang², H. R. Wu², L. Xue⁶, Y. Yamamoto¹⁰, K. Yamauchi¹², Z. Yang²,
S. Yasue²⁶, A. F. Yuan⁴, T. Yuda¹⁴, L. M. Zhai², H. M. Zhang², J. L. Zhang²,
X. Y. Zhang⁶, Y. Zhang², Yi Zhang², Ying Zhang², Zhaxisangzhu⁴, X. X. Zhou⁷

(The Tibet AS γ Collaboration)

- ¹*Department of Physics, Hirosaki University, Hirosaki 036-8561, Japan*
²*Key Laboratory of Particle Astrophysics, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China*
³*National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China*
⁴*Department of Mathematics and Physics, Tibet University, Lhasa 850000, China*
⁵*Department of Physics, Hebei Normal University, Shijiazhuang 050016, China*
⁶*Department of Physics, Shandong University, Jinan 250100, China*
⁷*Institute of Modern Physics, SouthWest Jiaotong University, Chengdu 610031, China*
⁸*Faculty of Engineering, Kanagawa University, Yokohama 221-8686, Japan*
⁹*Faculty of Education, Utsunomiya University, Utsunomiya 321-8505, Japan*
¹⁰*Department of Physics, Konan University, Kobe 658-8501, Japan*
¹¹*Research Institute for Science and Engineering, Waseda University, Tokyo 169-8555, Japan*
¹²*Faculty of Engineering, Yokohama National University, Yokohama 240-8501, Japan*
¹³*Department of Physics, Shinshu University, Matsumoto 390-8621, Japan*
¹⁴*Institute for Cosmic Ray Research, University of Tokyo, Kashiwa 277-8582, Japan*
¹⁵*National Center for Space Weather, China Meteorological Administration, Beijing 100081, China*
¹⁶*School of Information Science and Engineering, Shandong Agriculture University, Taian 271018, China*
¹⁷*Saitama University, Saitama 338-8570, Japan*
¹⁸*National Institute of Informatics, Tokyo 101-8430, Japan*
¹⁹*Sakushin Gakuin University, Utsunomiya 321-3295, Japan*
²⁰*College of Science, China University of Petroleum, Qingdao, 266555, China*
²¹*Tokyo Metropolitan College of Industrial Technology, Tokyo 116-8523, Japan*
²²*Max-Planck-Institut für Physik, München D-80805, Deutschland*
²³*College of Industrial Technology, Nihon University, Narashino 275-8576, Japan*
²⁴*Shonan Institute of Technology, Fujisawa 251-8511, Japan*
²⁵*Japan Atomic Energy Agency, Tokai-mura 319-1195, Japan*
²⁶*School of General Education, Shinshu University, Matsumoto 390-8621, Japan*

E-mail: tibet.asg@gmail.com

To measure the correlation between thundercloud and atmospheric charged particles, we have installed some atmospheric electric field meter at a site on the Tibet Air shower Array (4,300m a.s.l.) since February 2010. In this paper, we report some results of coincident observation of data from the array and atmospheric electric field during thunderstorm. In addition, we present comparisons of a Monte Carlo simulation with the relativistic runaway electron avalanche in cosmic-ray air shower.

*The 34th International Cosmic Ray Conference,
30 July- 6 August, 2015
The Hague, The Netherlands*