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INTERNATIONAL CONFERENCE ON COSMIC RAYS AND THE EARTH STORM Part III

III-2-24. Concluding Comments by Chairman

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The speakers today have been very helpful in that they have already mentioned the main points occurring in many of papers presented in the ordinary sessions, including the papers by the speakers who were not able to be on the program this morning. However, I beg your indulgence to summarize some interesting work that was not mentioned.

We have heard at this meeting of several attempts to detect photon primaries. The Polish group (Firkowski, Gawin, Maze and Zawadsky) have found tentative evidence that a few per thousand of the EAS have photon primaries, on the basis of an absence of μ mesons in showers of high electron density. The Tokyo group has also picked up some apparent photon-produced showers on the same basis. A Soviet group (Chudakov, V. I. Zatsepin, Nesterova and Dadykin) has applied a different technique, namely the use of Cerenkov radiation telescope of high angular resolution (1°) in an attempt to distinguish point sources. They found tentative evidence for a possible peak in the direction of Cygnus *A*, but the peak was not far above the backgound. The BASJE described by Suga has promised for the future in that it incorporates both a very large meson detector and good angular resolution as means of distinguishing photon primaries. The signal to noise ratio in detecting a point source improves as the inverse square of the angular resolving power. For this reason a paper offered by Porter and Hill is of special interest. Working at MIT, they succeeded in photographing the axes of EAS directly in their own light. The Cerenkov light effects are stored in the phosphor of an image tube for ten microseconds, and then, on command from the signal of an ordinary photomultiplier, and image intensifier is switched on, and the amplified image is photographed. An example is shown in the slide. The large blob in the left-hand picture is the self-photograph of the core of the air shower. The right-hand picture shows the background when there is no air shower present. Both pictures contain a sharp spot which is the image of a bright star. The whole picture has a large angular diameter of about 17°. The blob that represents the air shower has a diameter of about 3°. Its center can be located within 0.1°. This technique adds a whole order of magnitude to the angular resolution with which shower cores can be located in direction, and therefore opens up important possibilities for the detection of weak point sources of high-energy gamma rays.

Discussion

Yamaguchi, Y.: I would like to know the lowest bound and/or the average of energies which is expected to observe (or has been observed).

Suga: More than 500 Mev~900 Mev in Bolivian Joint Experiment.