UNIVERSITY OF CHICAGO
Chicago, Illinois

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Instruments designed and developed at the University of Chicago to measure energetic charged particles coming from the galaxy, the sun, and trapped in the magnetic field of earth are included in the Explorer VI satellite payload. The instrument has the interesting property that it will detect high energy particles even in the presence of high intensity low energy particles such as are found in the outer radiation belt.

The purpose of the University of Chicago experiments is to attack three related problems:

1. To measure high energy radiation trapped in the earth's magnetic field.
2. To detect the generation of charged particle radiation by processes on the sun, such as solar flares.
3. To study the electromagnetic conditions in the nearby interplanetary space through the detection of high energy particles traversing this region of space.

Depending on the success of this satellite, similar instrumentation likely will be used in several deep space probes in the months ahead.

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These experiments are being carried out by Peter Meyer and J. A. Simpson of the University's Enrico Fermi Institute for Nuclear Studies, and by C. Y. Fan and the engineering staff of the Chicago Midway Laboratories, a division of the University's Laboratory for Applied Sciences.

The apparatus is composed of a triple coincidence counter system surrounded by 5 MM of lead. The instrument is so designed that high energy charged particles may be measured separately from the intense, but low energy particles trapped in the magnetic field of the earth. The circuit is composed of amplifiers, logic circuits and information storage circuits capable for providing information on both the high energy radiation and the low energy radiation. There are three telemetry channels from the satellite to earth.

In an earlier space probe, the detector system measured an intense flux of high energy trapped protons near the lower edge of the Van Allen zone.

Since one of the objectives of the experiment is to detect particles accelerated to high energies at the time of unusual solar events, a temporary 24 hour watch has been established in the Fermi Institute to receive data from stations over the world observing solar and solar-related phenomena. The Institute's network of cosmic ray stations extending northward from Peru continues through this period as part of the experiment. In case an unusual event such as a giant flare is detected, communication channels have been arranged whereby the ground stations for recording telemetry signals from the satellite will be alerted to obtain additional data from the satellite at these special times.

It should be pointed out that a solar active region of outstanding importance was studied during July and will again face the earth during early August. This region has been called "Q" by the High Altitude Observatory, Boulder, Colorado, and may display interesting phenomena for study almost immediately after the launching of the satellite.

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