

## PHYSICS

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### ABSTRACTS

**The Whistler Phenomenon Used as a Tornado Warning Mechanism.** GERALD J. SHEA, Indiana State University, Terre Haute, Indiana 47809. —For over sixty years scientists have investigated the whistler phenomenon. Discovered by accident during World War I it had to wait until the space age for a logical explanation. It is now believed the Van Allen belts trap energy released by thunderstorms to produce the phenomenon.

Whistlers may be detected by simple devices which can be built by anyone. A slightly modified audio amplifier provided with some form of antenna, a variable resistance coupled ground, and a recording instrument complete the apparatus.

Tornado-producing thunderstorms have been monitored on two occasions in 1976, one at 4:15 A.M. on February 21 and the other at 4:40 P.M. on March 20.

Results seem to show that whistlers increase in number as storm cells intensify. To observers in the path of the storm the phenomenon varies as to the approach and departure of the storm cell. However, only storms monitored at dawn and dusk so far have produced records of Whistler phenomenon. It remains obvious much more research remains to be done in this very interesting and relatively unexplored field of science.

**Low Level Liquid Scintillation Spectroscopy.** GREGORY PETERSON, Department of Physics, Indiana State University, Terre Haute, Indiana 47809.—A low level counting system is desired for alpha and beta emitting radionuclides solubilized in liquid scintillation fluid. A major problem in absolute counting of low energy radioisotopes (such as tritium or carbon 14) is that of energy quenching. Determination of quenching amounts of radioisotopes with liquid scintillation systems is laborious and time consuming. This paper reports on the modular interfacing of a liquid scintillation detecting system to a Northern ND180 multi-channel analyzer. The data from such a system shows that low level beta spectroscopy with energy quenched radionuclides is practical.

**A Computer Based Comparison of Geometric and Analytical Algorithms for Elasticity Validity Testing of Stopping Kaon Beam Interactions with Free Protons in Nuclear Emulsion.** P. MILLER and G. P. THOMAS, Ball State University.—A special computer program was devised to perform various operations on data collected from fifty-two suspected negative Kaon-Proton elastic interactions in nuclear emulsion. Collision

fragment energies are interpolated from stored range-energy graphs. Then energies along with angle measurement data are used in the program to compute kinematical variables used in a comparison of geometric elasticity algorithms and more complete analytic elasticity algorithms.

**Shadow Band, Radio Frequency and Optical Observations at the 23 October 1976 Solar Eclipse in Australia.** MALCOM E. HULTS, DANIEL A. MITCHELL and DUANE W. WARN, Ball State University, Muncie, Indiana 47306.—Visual, photographic and photoelectric experimental systems to detect and measure shadow bands before and after totality were set up near the center line of the eclipse path north of Melbourne, Australia. Detectors to measure the predicted increase in rf noise during totality were also set up as well as equipment to photograph the corona of the sun.

Results are presented and compared with previous results from eclipses in 1966, 1970, 1972, and 1973.