

## A NEW HIGH-RESOLUTION METHOD FOR MEASURING COSMIC RAY COMPOSITION BEYOND 10 TEV

S. P. Wakely (1), D. B. Kieda (2) and S. P. Swordy (3)

(1) Enrico Fermi Institute, University of Chicago, Chicago, IL 60637, U.S.A.,  
(2) Department of Physics, University of Utah, Salt Lake City, UT 84112,  
U.S.A., (3) Enrico Fermi Institute, Department of Physics, and Department of  
Astronomy and Astrophysics, University of Chicago, Chicago, IL 60637, U.S.A..  
`wakely@ulysses.uchicago.edu`

A new high-resolution method for the determination of cosmic ray elemental composition beyond 10 TeV is presented. The technique combines a measurement of the Cerenkov light produced by the incoming cosmic-ray nucleus in the upper atmosphere with an estimate of the total nucleus energy produced by the extensive air shower initiated when the particle interacts deeper in the atmosphere. The emission regions prior to and after the first hadronic interaction can be separated by an imaging Cerenkov system with sufficient angular and temporal resolution. The expected charge resolution of the technique is  $\Delta Z/Z < 5\%$  for incident iron nuclei in the region of the “knee” of the cosmic-ray energy spectrum. This resolution is essentially independent of hadronic interaction model.