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Optimization of energy reconstruction for ANITA III VIATCHESLAV BUGAEV, BRIAN RAUCH, ROBERT BINNS, MARTIN ISRAEL, Department of Physics and McDonnell Center for the Space Sciences, Washington University in St. Louis, KONSTANTIN BELOV, DAVID URDANETA, JOE LAM, Department of Physics and Astronomy, UCLA, ANDREW ROMERO-WOLF, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, STEPHANIE WISSEL, Department of Physics and Astronomy, UCLA, ANITA COLLABORATION — The third flight of the high-altitude balloon-borne ANtarctic Impulsive Transient Antenna (ANITA III) planned for December 2014 will be optimized for the measurement of impulsive radio signals from the charged component of extensive air showers initiated by Ultra-High Energy Cosmic Rays (UHE CR) in the frequency range $\sim 80-$ ~ 1200 MHz (RF), in addition to detection of radio impulses initiated by the high-energy neutrinos, which was the objective of the first two ANITA flights. Based on an extensive set of Monte Carlo simulations of radio emissions from CR with the ZHAireS simulation package, we propose a strategy of utilizing reconstructed RF spectra from individual showers optimized for the energy reconstruction of primary CR particles. The optimization, in particular, takes advantage of an extended sensitive frequency range of ANITA III due to adding a drop-down antenna shifting the lower limit from ~ 180 MHz to ~ 80 MHz. An idealized model of the detector is used in our study, in which RF spectra can be reconstructed to an arbitrary precision.

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