POLAR BALLOON EXPERIMENT FOR ASTROPHYSICS RESEARCH (POLAR BEAR)

J.Adams (1), G.Bashindzhagyan (2), P.Bashindzhagyan (2), A.Chilingarian (3), J.Donnely (4), L.Drury (4), N.Egorov (5), S.Golubkov (5), N.Korotkova (2), W.Menn (8), M.Merkin (2), M.Panasyuk (2), D.Podorozhnyi (2), J.Procureur (6), T.Roganova (2), O.Saavedra (7), A.Sidorov (5), M.Simon (8), L.Sveshnikova (2), A.Thompson (4), A.Turundaevsky (2), I.Yashin (2)
(1) NASA Marshall Space Flight Center, Huntsville, Alabama, USA, (2) Moscow State University, Institute of Nuclear Physics, Moscow 119899, Russia, (3) Yerevan Physics Institute, Armenia, (4) Dublin Institute for Advanced Studies, Ireland, (5) Research Institute for Material Science and Technology, Zelenograd, Russia, (6) CENBG (Nuclear Research Center), F33175 Gradignan-Cedex, France, (7) Torino University, Italy, (8) University of Siegen, Germany.
glb@mary.npi.msu.su, Fax: +7-095-939-5948

A new balloon experiment is proposed for a long duration flight around the North Pole. The primary objective of the experiment is to measure the elemental energy spectra of high energy cosmic rays in the region up to 10^{15} eV. The proposed instrument involves the combination of a large collecting area (≈1.0×1.0 m^2) KLEM (Kinematic Lightweight Energy Meter) device with an ionization calorimeter having a smaller collecting area (≈ 0.5×0.5 m^2) and integrated beneath the KLEM apparatus. This combination has several important advantages. Due to the large aperture (> 2 m^2 sr) of the KLEM device a large exposure factor can be achieved with a long duration balloon flight (2-4 weeks). The calorimeter will collect about 10% of the events already registered by KLEM and provide effective cross-calibration for both energy measurement methods. Details of the experiment and its astrophysical significance will be presented.