WIZARD/PAMELA

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The space mission PAMELA, on board the Russian Satellite Resurs-DK1, is running and taking data since 2006 and will operate until the end of 2018 according to recent agreements between INFN, ASI and the Russian Space Agency Roscosmos. The instrument, the main scientific goals and the results of the experiment have been described in detail in the previous reports.
The LNF WIZARD/PAMELA group has continued in 2015 its regular activity in the analysis, running and quick-look control of the mission. In particular, it is fully involved in the study and analysis of solar events (Solar Flares, Solar Energetic Particles (SEP), Forbush decrease) in collaboration with Universities and Institutions (including NASA) in USA, Germany and South Africa. This work, in particular, has been the object of a PhD thesis on the study of low energy protons in the cosmic radiation and the role of the Sun and the Heliosphere in their production and propagation in the Galaxy.
As it is well known, significant results have been obtained and published on the spectrum of positrons, electrons antiprotons, protons and He nuclei. An implementation and update of these results is in progress with the refinement of data reduction algorithms and the extension of the statistics.
The collection of all the results so far obtained by PAMELA has been published in 2014 in a monographic issue of Physics Report Journal (see publications below).
Presentations on the most recent results of the experiment have been given in several Conferences, in particular at the biennial ICRC 2015 Conference (The Hague, Netherlands)
It is worth to note that, since 2013, under the agreement between INFN, ASI and Telespazio, a dedicated database for PAMELA has been created and developed and is in operation in the ASI Science Data Center (http://www.asdc.asi.it) as a data archive with open access through web interface to the scientific community.
Since several years PAMELA is a Recognized Experiment at CERN under the code PAMELA RE2B (https://greybook.cern.ch/greybook/experiment/detail?id=RE2B).

Recent publications

1. "The PAMELA Mission: Heralding a new era in precision cosmic ray physics"; O. Adriani et al., Physics Reports, **544**, 323-370 (2014)
2. "New Upper Limit on Strange Quark Matter Abundance in Cosmic Rays with the PAMELA Space Experiment; O. Adriani et al. (PAMELA Collaboration) Phys. Rev. Lett. **115**, 111101
3. "Time dependence of the e^- flux measured by PAMELA during the 2006 july –2009 december solar minimum"; O. Adriani et al. Astrophys. J. **810** (2015) 142
4. "Search for Anisotropies in Cosmic-ray Positrons Detected by the Pamela Experiment"; O. Adriani et al. Astrophys. J. **811** (2015) 21
5. "Reentrant albedo proton fluxes measured by the PAMELA experiment"; O. Adriani et al. Geophys. Res. Space Physics - **vol. 120, issue 5** (2015) 3728
6. "Detection of a change in the North-South ratio of count rates of particles of high-energy cosmic rays during a change in the polarity of the magnetic field of the Sun"; A. V. Karelin et al. JEPT Letters, **vol.101, Issue 4** (2015)231
7. "Measurement of the large-scale anisotropy of cosmic rays in the PAMELA experiment"; A. V. Karelin et al. JEPT Letters, **vol.101, Issue 5** (2015)298
8. "Force-field parameterization of the galactic cosmic ray spectrum: Validation for Forbush decreases"; I.G. Usoskin et al. Advances in Space Research, **55** (2015)2945
9. "Trapped proton fluxes at low Earth orbit measured by the PAMELA experiment"; O. Adriani et al. Ap J. Lett., **799,** (2015)L4

10. “PAMELA’s Measurements of Magnetospheric Effects on High Energy Solar Particles”; O. Adriani et al. Ap J. Lett., **801,** (2015)L3
11. 17 contributions presented at the 34th ICRC 2015, The Hague, Netherlands; see http://indico.cern.ch/event/344485/contributions for a detailed list