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## Low energy cosmic rays and balloon-borne experiments.

During the last decade, balloon-borne experiments dedicated to more and more detailed measurements of low energy cosmic rays have achieved important progress : new challenge in solar physics and dosimetry, search for signals of dark matter in cosmic rays and diffuse  $\gamma$ -rays at higher energy, search for antimatter or consistency of the “leaky box” model, etc. New candidates enlarging the multiplicity of cosmic ray sources have motivated an important effort on sophisticated instruments. Important data of high quality have been recorded by the balloon-borne missions such as BESS and BESS-polar, ATIC, CREAM, CAPRICE or RUNJOB, under small ranges of atmospheric thickness between  $2\text{g/cm}^2$  up to  $20\text{g/cm}^2$  in the case of important zenith angles and various float altitudes. Therefore, we have started new calculations implying different options of CORSIKA. Considering the convergence of several measurements of particles energy spectra with large statistics under  $100\text{GeV}/c$ , we have used this energy band to testify the predictions for the models of p-air and A-air interactions implemented in CORSIKA. For projectile hadrons of energies lower than  $100\text{GeV}$ , the cascades of secondaries are completely reproduced by the hadronic interaction generators GEISHA, UrQMD, FLUKA. For secondary particles with energy exceeding  $5\text{GeV}$ , the comparison becomes more complicated by the combination with different high energy collision Monte Carlo generators (operating above  $80\text{GeV}$ ), QGSSJet, SYBILL, DPMJet, EPOS and we have extended hybrid simulations up to  $10\text{TeV}$ . The fluxes obtained for positive and negative electrons and muons, photons, p, p-bar, n, n-bar are produced according to suitable inputs of primary spectra, i.e. local interstellar spectrum (LIS) modulated by the force field model when the solar modulation cannot be neglected.

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