Contribution ID: **33** Type: **not specified**

Space-flight readiness assessment of the PAN demonstrator mechanical design

Wednesday 8 June 2022 14:45 (30 minutes)

The Penetrating Particle Analyzer (PAN) instrument is intended to be installed on deep space and interplanetary missions and designed to measure the flux, the composition and the arrival direction of $100\frac{MeV}{n}$ to $20\frac{GeV}{n}$ highly penetrating cosmic particles.
While representing an additional cost for space missions, the PAN instrument could be a useful source of information on the space environment; information which can then be used to perform Space Weather forecast and to assess the radiation environment of other planets.

Being designed to be an additional payload to any purposes spacecrafts, the PAN instrument is compact, modular and has low-power needs. For the measurement of the particles properties, the instrument will relay on the magnetic spectrometer technique already employed on space experiments such as Pamela and AMS. Being more specific, the PAN instrument will be composed by two permanent magnets, three silicon-microstrip detective surfaces, two TOF - Time Of Flight - scintillators and two Pixel layers.

In this presentation, the current status of the PAN technology demonstrator will be presented. Specifically, a detailed introduction on the experiment scopes and mechanical design will be followed by the description of the peculiarity of the space environment in which the experiment will operate and on the mechanical loads which will be experienced by the instrument during the launch. Then the presentation will concern with the qualification tests performed on some components of the instrument and on the test which will be later performed on the whole assembly. To conclude, the FE mechanical simulations will be presented along with the correlation with the results obtained during the mechanical tests: deterministic and random vibrations and pyro-shock.

Authors: MANCINI, Edoardo; Dr MUSSOLIN, Lorenzo (University of Perugia)

Co-authors: Mr CADOUX, Franck; Dr AMBROSI, Giovanni (INFN - Perugia); Mr AZZARELLO, Philippe; Mr NICOLA, Laurent; Mr PAMPALONI, Sylvain

Presenter: MANCINI, Edoardo