Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11187, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11187
EGU General Assembly 2008

A lunar spectrometer for Radon emanations linked to seismic activity

C. Fidani (1), R. Battiston (1)

(1) Istituto Nazionale Fisica Nucleare, Perugia, Italy

We present the design of an alpha particle detector based on silicon photo multipliers (SiPM) and scintillator fibers. SiPM detector has an advantage of having the capability of detecting extremely low photon fluxes and it has an extremely fast response. Coupled with scintillators fibers SiPM form a tracking sensor. The concept of the particle spectrometer consists of a magnetic filter which define a directional selection. The key part of the spectrometer is the scintillator fiber-SiPM detectors with a high positional resolution and a simple assembly technology. The scintillator fiber-SiPM detector is under development for several applications from orbital to surface use. We describe two possible configurations: first, one using a cryogenic system to obtain best performance and second, one without thermal control for a simpler system. This detector is designed to answer the issue of Radon emanations for celestial bodies where no or weak atmosphere is present. In such conditions alpha particles propagation can reach several hundred kilometers, as shown in past Lunar missions. Radon emanation are under study in connection with out-gassing of our satellite as well as moonquakes and could be a reliable investigation technique to study for planetary crustal stress.