Contribution ID: **25**   Type: **not specified**

TOPS: Time Of flight Plastic Scintillators

Monday, 9 November 2020 11:05 (10 minutes)

Organic scintillators are largely exploited in a wide range of detectors due to their capability to obtain very good time resolutions. Plastic scintillators are also relatively cheap, easy to manipulate and light (low density) with respect to conventional crystal scintillators. Traditionally they are exploited to perform very precise measurements of particle Time of Flight (TOF) and more in general fast detectors.The research and development on organic scintillators is always active and in this framework a collaboration between the physics, engineering and chemistry groups of University "Sapienza"of Rome and Centro Studi e Ricerche Enrico Fermi started the TOPS project (Time Of flight Plastic Scintillators) focused on the development of a new class of plastic scintillators. TOPS scintillators have been realised in liquid and solid samples and their intrinsic characteristics have been studied. The samples show very promising light output with respect to anthracene and commercial scintillators and extremely good timing properties. In order to improve the matching between the emission/absorption spectra of the scintillators, doping material have been added as wave-shifter. The use of MDCD as doping improved the performances of a fraction of the scintillator samples. Based on the comparison of the light output values obtained in measurements with cosmic rays, a selection of the most promising scintillators has been investigated also from the timing point of view. The scintillation time characteristics of the TOPS plastic samples at different concentration that have been analysed so far with minimum ionizing particles and carbon at 700 MeV will be shown. A commercial plastic scintillator has been used as a reference in all the setup. The samples response in terms of light output and timing properties with proton beams and a dedicated measurements campaigns would be of large interest for this project.

Primary authors: BELARDINI, Alessandro (Sapienza Università di Roma - Dip. SBAI); MARAFINI, Michela (Centro Fermi); ROCCO, Daniele (Università di Roma Sapienza); SARTI, Alessio (LNF); SCIUBBA, Adalberto (ROMA1); TRAINI, Giacomo (ROMA1); PATERA, Vincenzo (ROMA1)

Presenter: MARAFINI, Michela (Centro Fermi)

Session Classification: Detectors - Second Session