



Contribution ID: 51

Type: not specified

## Organic thin films as flexible, large area X-ray and proton detectors

We report on novel, fully organic detectors for a real-time beam and dose monitoring over a large area, that permit, as an example application, to verify the actual dose delivered during medical radiotherapy (both with X-ray- or proton- beams), improving the quality of patients care and preventing long-term toxic effects. The use of organic semiconductors as active detection layers allows to implement devices that achieve two key goals: i) their thin, flexible and large area structure permits their conformable use directly on the patient during therapy; ii) their organic composition results a tissue-equivalent devices, a very relevant advantage for medical dosimeters.

We will discuss two different device geometries developed in the FIRE INFN-CSN5 project: one operates in the direct mode (direct conversion of the X-ray or proton beam into an electron-hole pair collected by the organic thin film device) and the other in the indirect mode (an organic scintillator coupled to an organic phototransistor). To date, there is no example of fully organic semiconductor detectors used as proton beam dose monitoring systems.

**Primary author:** FRABONI, Beatrice (Istituto Nazionale di Fisica Nucleare)

**Co-authors:** ALOISIO, Alberto (NA); BASIRICÒ, Laura (Istituto Nazionale di Fisica Nucleare); Dr CALVI, Sab-rina (CNR); BRANCHINI, Paolo (Istituto Nazionale di Fisica Nucleare); CARTURAN, Sara Maria (LNL-INFN); CIA-VATTI, Andrea; Dr MARIUCCI, Luigi (CNR); FRATELLI, Ilaria (Istituto Nazionale di Fisica Nucleare); SARNELLI, Ettore (Istituto Nazionale di Fisica Nucleare); QUARANTA, Alberto (TIFPA - University of Trento)

**Presenter:** FRABONI, Beatrice (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** Solid State Detectors