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HASPIDE: a project aiming at the development of hydrogenated amorphous silicon radiation detectors on a flexible substrate

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Hydrogenated amorphous silicon (a-Si:H) is a material with an excellent radiation hardness and with the possibility of deposition on flexible substrates like Polyimide (PI). Exploiting these properties, the HASPIDE (Hydrogenated Amorphous Silicon PIxels DEtectors) project has the goal of developing a-Si:H detectors on flexible substrates for beam dosimetry and profile monitoring, neutron detection and space experiments. The detectors for this experiment will be developed in two different structures: the p-i-n diode structure, that has been used up to now for the construction of the planar a-Si:H detectors, and the recently developed charge selective contact structure. In the latter the doped layers (p or n) are replaced with charge selective materials namely electron-selective conductive metal-oxides (TiO2 or Al:ZnO) and hole-selective conductive metal oxides (MoOx). In this presentation the aim and the structure of the project will be described and some preliminary data on the capabilities of these detectors to measure x-ray, electron and proton fluxes will be presented. In particular, the linearity, the sensitivity, the stability and dark current in various conditions will be discussed. Also, some results about radiation testing will be presented.

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