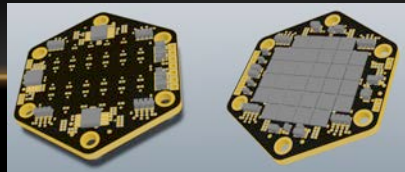
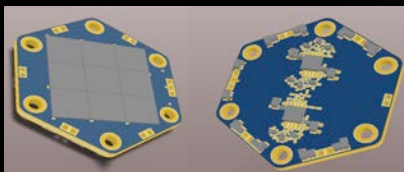


Large size SiPM matrix for Imaging Atmospheric Cherenkov Telescopes applications



The goal of this research is to develop a silicon-based prototype for an IACT pixel, the "basic element" of a Cherenkov Telescope focal plane camera. This will be the solid-state equivalent of a PMT, having a few square centimeters of sensitive area (~ 1 inch pixel in diameter: 0.1° @ 17m focal length in the case of MAGIC), high photon detection efficiency, good single-photon sensitivity, and time response around 2-3 ns



As a demonstrator we built and characterized a $16 \times 3 \times 3 \text{mm}^2$ sensor, on a structure designed to be compatible with the pixel size of the MAGIC telescope. The performance of this sensor is compatible with the operational requirements: single-phe resolution (S/N ratio ~ 3), $\sim 3\text{mV}/\text{phe}$ output signal, 2-3 ns peak width, linearity up to ~ 100 phe. The power consumption of the adder stage is $\sim 360\text{mW}$ (SiPM power consumption not included).

