

## Geometrical considerations on hexagonal SiPM

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The ideal distribution of the detectors of a preclinical Positron Emission Tomography scanner is a sphere with the subject located at its center. However, rigid scintillators crystals and detectors do not suit smooth figures. A truncated icosahedron has been previously proposed as a feasible approach to cover  $4\pi$  steradian. In order to tile the polyhedron, hexagonal scintillators and photodetectors have been designed and manufactured. In this work, we explore the advantages of the hexagonal geometry. Four scintillator geometries (hexagon, square, triangle and cylinder) are compared in terms of their light yield. A field flood image of a hexagonal scintillation array of 181 crystals read with four channels multiplexing along the diagonals of the hexagonal photodetector is presented. Finally, the pixel resolution of a sub-surface laser engraving square scintillator array is evaluated with hexagonal and a square photodetectors.

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