

## **Principle of operation of an innovative new sensor for neutron detection based on resistive AC coupled LGAD**

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In this work, we present the principle of operation of an innovative sensor for neutron detection obtained by depositing a thin layer of converter, about 35 microns of  ${}^6\text{LiF}$ , on a multi-pad AC-LGAD. When the neutrons are captured in the converter, the ensuing emission of alpha particles and/or tritium nucleuses is recorded by the silicon sensor. In this study, the AC-LGAD is first glued on a 16-ch read-out board, then, a well to contain the converter is positioned around the sensor, and, lastly, the converter is deposited by means of an evaporative technique. The good timing performances and excellent position resolution of such detector are ideal for applications in neutron imaging.

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