

Title (en)

TWO-DIMENSIONAL DETECTOR OF IONISING RADIATION AND METHOD FOR MAKING SAME

Title (de)

ZWEI DIMENSIONALER DETEKTOR FÜR IONISIERENDE STRAHLUNG AND VERFAHREN ZUR HERSTELLUNG

Title (fr)

DETECTEUR BIDIMENSIONNEL DE RAYONNEMENTS IONISANTS ET PROCEDE DE FABRICATION DE CE DETECTEUR

Publication

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Application

EP 00906461 A 20000223

Priority

- FR 0000448 W 20000223
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Abstract (en)

[origin: FR2790100A1] The two-dimensional ionizing radiation detector comprises a conversion material block (2) with fluid medium filled slits (14) producing particles representative of the incident particle intensity and position. The two-dimensional ionizing radiation detector comprises a block (2) of conversion material which emits secondary particles by interaction with primary particles of the incident radiation, the block thickness being at least one-tenth of the mean free path of primary particles in the block material. The block has parallel through-slits (14) filled with a fluid medium capable of interacting with the secondary particles to produce tertiary particles which are representative, in intensity and position, of the incident radiation, the block being oriented to present a first slit termination face to the incident radiation. An Independent claim is also included for the production of the above detector in which the slits are formed in the block by water jet cutting, spark machining or unwound taut wire cutting. Preferred Features: The slits (14) may be perpendicular to the block face or may make an angle of 1-5 deg with a normal to the block face. The fluid medium is a gaseous medium which is ionized by the secondary particles to produce electrons as the tertiary particles, the detector having an electric field generator for extracting these electrons from the block. The detector also has an analyzer which analyzes the extracted electrons and which comprises a gas avalanche amplifier producing electron avalanches. The gaseous medium may convert electron avalanches into light or UV radiation, in which case the analyzer comprises a light or UV detector (34) in the form of a camera or amorphous silicon photodiode array placed against the gas avalanche amplifier. The block comprises a stack of electrically conductive layers alternating with electrically insulating layers, in which electrically conductive layers form the end faces, the electric field being generated by electrically biasing the electrically conductive layers at electrical potentials crossing from the first face to the opposite second face and the electrically conductive layer at the second face being blackened to avoid parasitic light reflections. Alternatively, the block comprises an electrically insulating or highly resistive material layer stack or massive block having electrically conductive layers or grids on its slit termination faces, the electric field being generated by biasing the layers or grids at different potentials. Another type of block comprises a stack of insulating or highly resistive conversion material sheets spaced apart by spacers to define the slits, the block having electrically conductive layers or grids on its slit termination faces and the electric field being generated by biasing the layers or grids at different potentials.

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