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Neutron Detectors Based on Microchannel Plates

A microchannel plates (MCPs) is an vacuum electron amplifiers with a wide range of applications. Their principle of operation is based on the avalanche-like strike multiplication of electrons inside tiny ($d \sim 10$ microns) tubes (microchannels) when an external electric field is applied. Exceptionally good time characteristics and precise spatial localization make them very promising for use in radiation detectors. This report provides an overview of some existing MCP-based neutron detectors. Various designs and their characteristics are described. A new detector design variant is also proposed for consideration.

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