

## **A New Method for Pulsed Neutron Monitoring with the Rem-Counter LB 6411 and Time-Resolved Readout**

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### Abstract

High-energy accelerators can produce strongly time-structured radiation fields. Such dose shots are generated at linear machines with low duty cycles as well as at circular machines when complete fills are instantaneously lost. The main dose component is due to high-energy neutrons occurring at that time structure. Usually, moderated rem-meters based on proportional chambers fail here as they extremely suffer from dead time effects. Therefore a new method for pulsed neutron dose monitoring was developed and investigated. It's based on an unstable intermediate state with a short half life. In this case, high-energy neutrons produce the Li-9 nuclide by spallation of the carbon in the moderator of the rem-counter LB 6411 from BERTHOLD Technologies. Its daughter nuclide is a neutron emitter. So, delayed neutrons are registered with a half life of 170 ms in time-resolved readout with 1 ms resolution. The response was measured along with passive dosimeters in the radiation field behind the lateral concrete shielding of a 7.5 GeV proton transfer line.