ANIMMA 2021
Prague, Czech Republic June 21-25, 2021

Contribution ID: **8** Type: **Poster**

#04-8 Investigation of pulsed fields generated by pulsed ionizing radiation generating equipment, testing of radiation measuring detectors, detection systems and simulations supporting testing

Thursday, June 24, 2021 4:45 PM (5 minutes)

Devices that generate ionizing radiation that operate with a short pulse time are increasingly used in industry, healthcare, and scientific research. In the case of pulsed operation, these devices create pulsed ionizing fields, which have different properties compared to those experienced at stationary sources. Correct measurement of pulsed spaces is a challenge for manufacturers and users, as well as for the organizations involved in licensing, and should be reviewed.

In pulsed space, currently used radiation measuring detectors typically measure lower-than-true values because they typically do not detect a pulse lasting less than one second or are unable to properly follow sudden, magnitude changes over a short period of time. In the case of short-pulse radiation, it is advisable to use special detectors with a sufficiently good time resolution and a wide measuring range, since in extreme cases the characteristics of the pulsed fields reach or even exceed the operating limits of the detectors.

In recent years, the EK SBL has set up a test track where various detectors could be tested first for stationary spaces and then for dynamic spaces. In 2019, EK BL started testing pulsed fields with equipment that generates ionizing radiation but does not contain radioactive material that produces a pulsed field.

The availability and testing period of the equipment was limited, so the SBL plans to generate a pulsed-field using a constant gamma beam source, in which the shielded-collimated beam is generated using a gamma chopper. With the help of the device to be created in this way, the available time required for the examination of the SBL pulsed space will increase, with the help of which we will be able to perform several examinations and tests in the future. The pulsed-field generated by the device is to be measured optically using a visible light beam and a brightness sensing device. Thus, we can measure the beam characteristic by measurement (frequency, brightness change over time, pulse length, pulse time). In addition to the measurements, we can theoretically determine and then compare the measured and calculated results based on the data of the rotating mechanics. As a result of these tests, the EC will be able to produce pulsed spaces known for their SBL characteristics.

With the help of the new device, there are more testing possibilities than before, in which we want to test several detectors for several characteristics, and then we formulate a recommendation based on the results, which detectors follow well on a given characteristic and are close to the expected value. measures, or if it follows the trend but does not show real value, we try to apply a correction function, with the help of which the device shows the expected value using the characteristic function later when measuring the pulsed space with a given characteristic.

Primary authors: BODOR , Károly; GULYÁS, Attila

Co-authors: ZAGYVAI, Péter; VOLGYESI, Péter; CSOME, Csilla; TOTH, Csaba

Presenters: BODOR , Károly; GULYÁS, Attila

Session Classification: 04 Research Reactors and Particle Accelerators

Track Classification: 04 Research Reactors and Particle Accelerators