PULSE POWER SUPPLY MODULE FOR THE ELECTROMAGNET OF THE BETATRON OF A MOBILE GAMMA-RADIATION GENERATOR

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The paper concerns a pulsed power supply module of the electromagnet for a mobile gamma-ray generator based on the compact air-cored betatron. The module contains a pulsed power supply system [1] of the betatron electromagnet and its transportation, operation and storage system. The first system includes a 0.7 MJ capacitive storage (a bank of eight capacitors of 300 μF and 24 kV each) and a switching unit. The second system includes a specially equipped twenty-foot cargo container on a semitrailer. The pulsed power supply system is used for producing a unipolar current pulse with the amplitude of 110 kA and the length of 1 ms at the base in the electromagnet windings. The time spread of the system triggering is less than 50 ns. The results of the module test runs are provided. The oscilloscope patterns of the signals from sensors for monitoring the parameters of the power supply system are presented. The module design can be applied in other mobile electro-physical installations, taking into account their electric parameters.

References

1. **Fomichev, V. A.** Mobile power supply system for the electromagnet of a gamma-radiation generator based on a cyclic accelerator [Text] / V. A. Fomichev, Yu. P. Kuropatkin, V. I. Nizhegorodtsev, K. V. Savchenko et al. // IEEE Pulsed Power Conference. – 2023. – DOI: 10.1109/PPC47928.2023.10310997.