Radiation from Relativistic Electrons in Periodic Structures "RREPS-23" & Electron, Positron, Neutron and X-ray Scattering under External Influences "Meghri-23"



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3D MAGNETIC FIELD MAPPING FOR PERMANENT MAGNET UNDULATORS

Hall magnetometry is one of the basic measurement methods for research and diagnostics of undulator systems for generating coherent synchrotron radiation. Present work is devoted to the development of 3D measurement device based on Hall sensors for the studies of magnetic characteristics of undulator systems constructed of permanent magnets. The main purposes of the developed 3D magnetic field mapping device are: -determination of the spatial distribution of the magnitude of magnetic induction (2D-3D mapping of the magnetic field (Bx, By, Bz) in undulators and its magnetic elements.

- determination of the integral characteristics of the magnetic field of undulator systems (the first and second integrals of the magnetic field) from the results of measurements of the spatial distribution of the magnitude of magnetic induction.

- evaluation of the phase error of the magnetic field of the undulator from the results of measurements of the spatial distribution of the magnitude of magnetic induction;

- measurements of the temperature of the medium in the working area during the measurement of the magnitude of magnetic induction

The algorithm and the results of preliminary measurements of the magnetic parameters of undulator systems will be presented. The developed measuring system is relevant for the design of insertion devices (undulators), is easy to construct and allows at the initial stages to obtain primary information about the magnetic characteristics of the undulator systems being developed.

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