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The project of optical diagnostics of the beam dimensions of the SKIF storage ring with ultra-low emittance

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The SKIF, a fourth-generation synchrotron radiation source is being constructed in Russia. This installation has an ultra-low emittance, allowing for high beam intensity in various scientific and technological fields. A crucial aspect of SKIF is its availability of diagnostic instruments that measure the beam transverse dimensions. This will allow for minimizing the emittance during operation and comparing it with a calculated value. This comparison is critical for determining whether the physical setup meets the design specifications. In addition to measuring the transverse dimensions of the beam, it is also important to observe the behavior of the longitudinal profile and measure its parameters with good accuracy.
Since the calculated emittance of 75 mrad corresponds to the beam sizes of less than 8 microns at the radiation output sites, a diagnostic complex was developed as part of the working project, including a beam size monitor based on a double-slit interferometer. Observation and measurement of the longitudinal distribution of the beam will be carried out using mutually complementary devices, such as a streak camera and electron-optical dissector.

Footnotes

Funding Agency

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Yes

Author: DOROKHOV, Victor (Russian Academy of Sciences)

Co-authors: MESHKOV, Oleg (Budker Institute of Nuclear Physics); BOYARKINA, Veronika (Budker Institute of Nuclear Physics SB RAS & Novosibirsk State University)

Presenter: DOROKHOV, Victor (Russian Academy of Sciences)

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