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Cherekov radiation spectral and resolution properties studies at SINBAD ARES

Tuesday 9 September 2025 16:00 (2 hours)

Optical Cherenkov Radiation (ChR) is a well-known type of radiation, which is utilized in different fields of physics such as charged particle detection or generation of intense THz radiation. It is also widely used in beam diagnostics, for instance, in beam loss monitors or for bunch length measurements. In addition, it is of potential interest for transverse beam profile diagnostics as an alternative for standard techniques as scintillating screens and optical transition radiation. In this work, spectral and resolution properties of optical ChR were studied at the SINBAD ARES accelerator with an electron beam energy of 150 MeV. Several fused silica crystals of different thicknesses were used as radiators. They could be rotated relative to the beam, which allowed to investigate the angular dependency of the ChR spectrum which is quasi-monochromatic. The monochromatization effect arises from the frequency-dependent nature of the fused silica permittivity. In addition, the beam size dependency on the target angle was investigated in view of differences for various crystal thicknesses.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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