

COHERENT RADIATION OF RELATIVISTIC ELECTRONS IN DIELECTRIC FIBERS FOR THE BEAM DIAGNOSTICS

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Dielectric fibers are widely used in technique for light transport. The ability to use a radiation of relativistic electrons in optical fibers in beam diagnostics was proposed recently [1]. The authors propose a method of measuring the transverse profile of electron beams using a fiber optic array. When an electron propagation through the core of a fiber emits Cherenkov radiation at an angle θ_{Ch} , determined by $\cos \theta_{Ch} = 1/n\beta$, where n is the index of refraction on and along the fiber axis. In the article [2] the theoretical analysis of contribution for different types of polarization radiation in optical fibers was presented. In this report, we present the results of the experimental investigations of coherent radiation properties in the fibers from dielectric materials for different fiber position relative to an electron beam. The experimental results show that we can use fibers for noninvasive beam position monitoring.

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References

- [1] R.Tikhoplav et. al. IPAC'12 Conf. Proc. 996
- [2] X.Artru, C.Ray C, 2013 Nucl. Inst. Meth. B **309** 162

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