

# Undulator Effect by Wakefield in a Periodically Bent Waveguide with Dielectric Filling

## Project partners

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## A brief description of the project proposal

The possibility of producing an electromagnetic radiation using a novel scheme of undulator based on the periodically bent accelerator structure with dielectric filling, called wakefield undulator, is considered. The proposed design shall have more flexible adjustment capabilities than traditional undulator based on permanent magnets or electromagnets.

The idea is to create an undulator or a wiggler without using any external magnetic field, but based on the interaction of a beam with Cherenkov radiation fields generated by itself in a dielectric waveguide.

To implement the proposed idea, construction of a mathematical model and computer simulation of the self-consistent beam dynamics in the wake fields excited by it in a curved wakefield waveguide will be carried out. On this basis, the optimal parameters will be selected to increase the efficiency of generation of undulator radiation. It is planned to search and select a suitable accelerator (XFEL, DESY, BESSY2, MAX IV, SOLARIS ...), search for collaborators – theoretical and experimental research groups, manufacturing and testing of waveguides and the proposed undulator.