



Contribution ID: 19

Type: **Poster**

Sapphire Decelerating Capillary Channel Integrated with Antenna at Frequency 0.675 THz

Tuesday 8 September 2015 18:00 (1h 30m)

Nowadays interest to the THz-radiation significantly increased in medicine (THz tomographs), in pharmaceutics (definition of medicament's compositions), in introscopy of large-size objects (ships, trains, containers) and others. THz-radiation can be generated by the relativistic electron bunches passing through Cherenkov decelerating capillary channel (circular waveguide with dielectric filling) with horn extraction. Relativistic electron beams having $\sim 100 \mu\text{m}$ in diameter and pulse durations of 1 ps or lower (as in photoinjectors) are capable to produce substantial power of THz-radiation. High-peak power coherent Cherenkov radiation can be produced by a properly modulated high-brightness electron beam or by a single, high-density bunch having sub-wavelength dimension. The aperture of Cherenkov decelerating structure should be comparable with the sub-mm wavelength (0.1-3 mm). Different dielectric materials for the internal surface coating of the capillary channel of mm-sub-mm cross-section can be used. As it's known frequency of 0.675 THz corresponds to the atmospheric window with the high transparency. In this report results of electrodynamics study of the metallized sapphire decelerating Cherenkov capillary will be presented. Horn antenna attached to the metallized sapphire capillary channel at 0.675 THz resonant frequency will be considered.

Author: ASHANIN, Ilya (NRNU MEPhi)

Co-author: Dr POLOZOV, Sergey (NRNU MEPhi)

Presenter: ASHANIN, Ilya (NRNU MEPhi)

Session Classification: Poster Section

Track Classification: 8. Advanced Generation of THz and X-ray beams