

## Modeling of Cherenkov radiation in semi-classical approach

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Cherenkov radiation detection is being used in the most experimental physics installations and, therefore, the detailed modeling to construct and study its properties is required. The methods of calculations in the time-spatial representation in the semiclassical approach were developed in [1-3] to simulate the electromagnetic field energy change in the passage of the primary particle and the secondary particles through the medium.

A separate consideration of the formation of the current density vector and the field excited by this current was considered in [4] in a semiclassical approach to modeling the electromagnetic field flux density in the optical range. At the first stage, the current density vectors of each charged particle are calculated using the GEANT4 simulation package. Secondly, the components and the energy of the electromagnetic field are calculated in the spatial-temporal representation by the formulas of classical electrodynamics.

The present results summarize the results obtained for the gas, liquid and solid states of the substance. The calculations were performed using data parallelization.

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