



Contribution ID: 39

Type: **Specialised Talk**

Electromagnetic radiation in the Tamm problem

Friday 22 June 2012 11:35 (20 minutes)

The ‘Tamm Problem’ (Tamm, 1939) is the calculation of the electromagnetic radiation emitted by a particle travelling a finite distance at a uniform (relativistic) velocity in a medium. It is exactly the problem which needs to be solved in Monte-Carlo simulations of the radio-emission from individual particles. The two main formulas used in calculations - the ZHS algorithm and the endpoint formulation - both use approximations in their derivations, the effect of which in realistic problems is currently unclear.

In this contribution, the ZHS and endpoint solutions to the Tamm problem are compared using simple toy experiments. In order to resolve questions on each method’s accuracy, a new approach to the problem is presented, which attempts to make none of the assumptions inherent in these previous formulas. The applicability of the ZHS and endpoint approaches is then re-assessed in light of this information.

Primary author: JAMES, Clancy (University of Erlangen-Nuernberg)

Presenter: JAMES, Clancy (University of Erlangen-Nuernberg)

Session Classification: Radio Detection Theory