



Contribution ID: 35

Type: **Specialised Talk**

Simulation of radio emission from cosmic ray air shower with SELFAS2

Thursday 21 June 2012 18:00 (20 minutes)

We present a microscopic computation of the radio emission from air showers initiated by ultra-high energy cosmic rays in the atmosphere. The strategy adopted is to compute each secondary particle contribution of the electromagnetic component and to construct the total signal at any location. SELFAS2 is a code which doesn't rely on air shower generators like AIRES or CORSIKA and it is based on the concept of air shower universality which makes it completely autonomous. Each positrons and electrons of the air shower are generated randomly following relevant distributions and tracking them along their travel in the atmosphere. We show in this paper that the radio emission is mainly due to the time derivative of the transverse current and the time derivative of the charge excess (see also [1]). The time derivative of the transverse current created by systematic deviations of charges in the geomagnetic field is usually dominant compared to the charge excess contribution except for the case of an air shower parallel to the geomagnetic field.

Primary author: MARIN, Vincent (Subatech)

Presenter: MARIN, Vincent (Subatech)

Session Classification: Radio Detection Theory