Contribution ID: **54** Type: **Invited Talk**

Theory and simulations of air shower radio emission

Wednesday 20 June 2012 14:30 (40 minutes)

A precise understanding of the radio emission from extensive air showers is of fundamental importance for the design of cosmic ray radio detectors as well as the analysis and interpretation of their data.

In recent years, tremendous progress has been made in the understanding of the emission physics both in macroscopic and microscopic frameworks. A consistent picture has emerged: the emission stems mainly from time-varying transverse currents and a time-varying charge excess; in addition, Cherenkov-like compression of the emission due to the refractive index gradient in the atmosphere can lead to high-frequency contributions in the signal.

In this overview talk, I will discuss this the emission physics as it is understood today, present the signatures that experiments are expected to see and exploit, and conclude with a description of the models currently on the market.

Author: HUEGE, Tim (KIT)

Presenter: HUEGE, Tim (KIT)

Session Classification: Radio Detection Theory