

Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

Application of Dielectric Resonators in Wireless Passive Sensing

M. Sc. Taimur Aftab
University of Freiburg

Donnerstag, der 09.03.2017, 09⁰⁰ Uhr
Cauerstraße 9, Tietze-Schenk-Saal.

Electrical instrumentation in high-temperature, high-humidity and other generally harsh environments is a key multi-disciplinary problem that can be solved using wireless passive sensing. The sensor node, in this case, is a batteryless, chipless linear-time-invariant device that is coupled to a RADAR-like base station via a wireless link. In this talk, a new approach to wireless passive sensing, using dielectric resonators, will be discussed and compared to state of the art.

First theoretical and numerical modelling of dielectric resonators in different configurations will be presented and performance metrics with respect to wireless passive sensing will be examined. Three application cases will be explored: force, torque and temperature sensing with each case using the dielectric resonator in a different electromagnetic configuration. Results from the experimental test setups will be discussed and the talk will conclude with an overview of opportunities and pitfalls in the field of wireless passive sensing as it exists in 2017.