UNIVERSITÄT
DUISBURG
ESSEN

Fachgebiet Hochfrequenztechnik

H F T

Fachbereich Ingenieurwissenschaften
Abteilung Elektrotechnik und Informationstechnik
Institut für Nachrichten- und Kommunikationstechnik

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Diplomarbeit / Masterarbeit

Aufgabe der Abschlussarbeit im Auslandsorientierten Studiengang

International Studies in Engineering

für: Frau Mihert Woodmatas

gestellt von: Prof. Dr.-Ing. K. Solbach
Fachbereich Ingenieurwissenschaften - Hochfrequenztechnik

Thema: Antenna design for ultra wideband communication

Description:

Applications in Ultra Wideband (UWB) communications operate with narrow pulses, in the frequency range of 3.1-10.6 GHz. This requires antennas with proper return loss, linear phase and constant radiation pattern throughout the whole bandwidth. In view of mobile applications, compact and small sized antennas have to be considered.

In literature various kinds of pulse antennas have been investigated, but just a few consider the behavior of the antenna within an UWB system and pulses incident from different spatial directions.

In the HFT department, a concept for UWB system simulations has been created, in which the single antenna element is a “black box” and can be connected to other system and network elements.

Assignment:

The task is to simulate the characteristics of various kinds of broadband and pulse antennas, which are discussed in literature, with the help of the 3D-EM simulation software HFSS available in the department. Using these results, a model should be created for each of the antenna designs, for the circuit simulation software Agilent ADS. The model should include the antenna characteristics as a function of frequency and radiation pattern. Using ADS, the response of the antennas on excitation with different kinds of transient pulses should be investigated and hence the efficiency of the investigated antennas for UWB communication applications should be proved.

A presentation should be held on the results of this thesis in the department's colloquium.