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Abteilung Elektrotechnik und Informationstechnik
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Studienarbeit / Bachelorarbeit

Aufgabe der Abschlussarbeit im ISE Bachelor/Masterstudiengang

Für: Mohammed Shalaby
gestellt von: Prof. Dr.-Ing. Klaus Solbach
Fakultät für Ingenieurwissenschaften - Hochfrequenztechnik
Thema: Circular antenna array beamforming for ultra wideband short pulse applications

Thesis Task:

In the modern short range communication technology, there is an increasing demand for wireless transmission techniques allowing locally very high data rates. An attractive solution is the use of very short pulses in the UWB frequency range (3.1 GHz to 10.6 GHz) to transmit data. Preceding research projects in our department have shown that short pulse arrayprocessing using Finite Impulse Response (FIR)-filters has the chance to significantly increase the coverage and data rate.

For that purpose, mainly linear antenna arrays have been investigated. A circular array is an configuration of very practical interest but so far only little effort has been devoted in view of its short pulse ability.

In particular the task incorporates:

- Literature review of narrowband and wideband circular beamforming.
- Implementation of conventional beamforming concepts and evaluation of time-domain circular array radiation patterns.
- Based on the available concept for linear arrays, proposal of a concept of frequency independent circular array beamforming using FIR-filters.
- As far as possible, comparison of FIR-filter controlled linear and circular antenna array pattern characteristics.

After completion of thesis work a public presentation of results is to be given at the department.