UNIVERSITÄT DUISBURG ESSEN

Fachgebiet Hochfrequenztechnik

H F T

Fachbereich Ingenieurwissenschaften
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Aufgabe der Studienarbeit im Hauptstudium II

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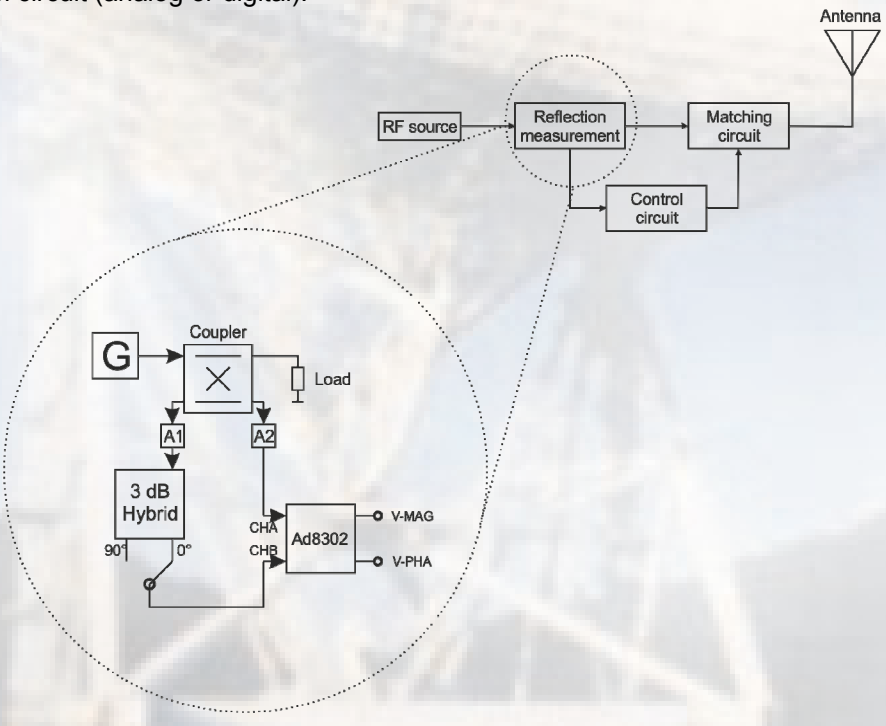
Thema: **Reflection Measurement Circuit for an Adaptive Impedance Matching System**

Beschreibung:

Radio frequency waves can penetrate into the human body when an antenna is positioned above the skin. Reflected waves are created by the air-to-skin interface and by objects inside the body. By placing the antenna on the body the antenna becomes mismatched. The amount of mismatch is dependent on the body structure and differs for various individuals. A method to reduce the reflection is known as adaptive impedance matching. The system consists of antenna, controllable matching circuit, mismatch measurement circuit and control circuit (analog or digital).



The task of the thesis is to build and investigate a reflectometer which measures the incident and reflected signals from a load. The measured vector reflection coefficient can be used to calculate the level of impedance mismatch and to control a matching circuit.

In particular, the task entails the following steps:

1. Search the literature for information on existing concepts
2. Design and assemble a reflection measurement circuit in printed circuit technology
3. Experimental verification of the circuit performance

At the end of the work, a public presentation of results is to be given.