

AUFGABE DER DIPLOMARBEIT im Hauptstudium II

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Thema: **Broadband Matching of Patch-Array Antenna**

Description:

The impedance match bandwidth of array antennas is fundamentally limited by the radiator elements. Conventional concepts for the broadening of array antenna bandwidth either start from improvement of the radiator elements, e.g. by employing electromagnetically coupled multi-element structures, or they use compensation- and matching-networks coupled to each element of the array system. Both approaches are problematic and can lead to higher cost.

In an earlier thesis work, the new approach of the *unilateral feed network* was discovered which allows the integration of matching networks into the array feed system; this improves the limited bandwidth of the radiators, without causing a more complex antenna system or an increase in cost. This is to be achieved by utilising parts of the matching network by several radiator elements at the same time. In this way the feed network serves a dual purpose, namely the distribution (and collection) of power and, additionally, the realisation of extensive matching networks for the radiator elements.

Thesis Task:

The task of the thesis is to

- investigate the new concept of a broad-banding distribution network of a patch array antenna using simulation.
- The aim of the investigations is the derivation of concepts and rules which can be used in the design of patch array antennas.
- The results of this step are to be demonstrated in the design of a complete patch array antenna.
- Improved matching bandwidth and the radiation pattern over frequency have to be evaluated by simulation and measurement of an experimental antenna.

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