MA04-011 - Future Mobile Communications Systems, Mathematical Modeling, Analysis, and Algorithms for Multi Antenna Systems

Abstract

In this project we develop new mathematical methods in order to model and analyze multi-antenna communications systems. Multiple transmit and receive antennas allow increases data rates and reliability in future wireless communication system while the transmission power can be reduced. Scattering problems that are governed by the wave equation are analyzed in order to find new methods for describing the wave propagation in multi-antenna systems. Based on these results new time-variant channel estimation methods and low complexity receiver algorithms are developed. Medium term applications are real time algorithms for currently planed multiple-antenna extensions of UMTS (3GPP release7) and WLAN (IEEE 802.11n) and the SmartSim MIMO development platform of ARC Seibersdorf research.

Keywords:
mobile communications, multi antenna systems (MIMO), timevariantchannels, wave propagation, prolate spheroidal functions

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Further links to the persons involved and to the project can be found under
https://www.wwtf.at/funding/programmes/past/ma/MA04-011/