Reconfigurable Orthonormal Basis Patterns Using ESPAR Antennas

Author(s) - Institution(s):
Panagiotis, Vasileiou, UPRC
Konstantinos, Maliatsos, UPRC
Evangelos, Thomatos, UPRC
Athanasios, Kanatas, UPRC

Corresponding author email: panovasi@yahoo.gr

Corresponding WG group:
WG
SWG1.1

Abstract:

Beamspace MIMO (BS-MIMO) systems have been recently considered in the literature because of the important advantage of their reduced hardware complexity. So far BS-MIMO research effort focuses on the development of efficient single-RF MIMO transmission schemes based on parasitic antenna arrays. Single-RF BS-MIMO systems can provide both multiplexing and beamforming capabilities that exploit the available aerial degrees of freedom of the radiated field while maintaining low space and complexity requirements. Previous studies used Electronically Steerable Passive Array Radiators (ESPAR) to propose a spatial multiplexing scheme for multiple data str eams with the use of an ESPAR-specific set of orthonormal basis patterns. However, the basis patterns ensure orthogonal transmission of the multiple data streams in ideal conditions ignoring the wireless channel propagation conditions. In this paper a new technique is developed that proposes the adaptive selection of the most effective basis patterns in both transmitter and receiver sides based on the actual wireless channel propagation conditions maximizing the system capacity.