

# Multiuser Diversity with Quantized Feedback

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IEEE Trans. on Wireless Communications, 6 (1). pp. 330-337.

Full text not available from this repository.

## Abstract

In this paper, we propose an optimal discrete rate switch-based multiuser diversity system (DSMUDiv) that reduces the feedback load while preserving the essential of the scheme's performance in some cases. We examine the DSMUDiv scheme using two scheduling criteria depending on the distribution of the mobile users in the cell: (i) absolute signal-to-noise ratio (SNR)-based scheduling in the case of independent and identical distributed (i.i.d.) users, and (ii) normalized SNR-based scheduling in the case of non-i.i.d. users. The paper includes the derivation of closed-form expressions of the feedback load in the case of absolute and normalized SNR-based scheduling and the spectral efficiency in the case of absolute SNR-based scheduling. Computer simulation is used to evaluate the spectral efficiency in the case of normalized SNR-based scheduling. Under slow Rayleigh fading assumption, we compare our scheme with the optimal (full feedback load) selective diversity scheme.