

# Application of the spatial division multiplexing technique in cooperative mimo systems

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## ABSTRACT:

*Cooperative MIMO is a combination technique between the single antenna cooperation communications and multiple-input multiple-output systems to achieve the advantages of traditional MIMO. In this paper, we focus on model that combines the spatial multiplexing technique and the cooperative communications, with relay nodes using decode and forward technique where source node and the relay nodes*

*have only one antenna, destination node has multiple antennas; and relay nodes use amplify and forward technique to reduce power consumption and suitable for compact devices; and destination node uses zero forcing (ZF) algorithm. Finally, we show our simulation results in applying the spatial division multiplexing technique in cooperative mimo systems.*

**Keywords:** *SDM, MIMO-SDM, Cooperative MIMO, Cooperative communication.*

## 1. INTRODUCTION

Nowadays, the demand of using broadband services and high-speed wireless platform is growing very fast, so the radio spectrum resources are running out. To overcome the issue, the multiple-input multiple-output (MIMO) technique, which uses multiple antennas at the transmitter and the receiver, is a promising technique to meet the demand to improve the quality and channel capacity of systems without increasing the transmit power and the frequency bandwidth

[1][2]. However, the implementation of MIMO systems on mobile terminals (referred to as MS) has to solve many challenges such as small size, limited energy, channel correlation, [3].

There are many previous research works focusing on spatial diversity to increase quality, but rarely consider the increase of the system capacity [4]. Therefore, the purpose of our paper research is to examine the model combining the spatial division multiplexing technique and the

