

**DECODE AND FORWARD COOPERATIVE DIVERSITY FOR TSV-MODEL
BASED 60 GHZ WPAN SYSTEM**

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ABSTRACT

Worldwide opening of tremendous amount of unlicensed spectrum around 60 GHz has created great interest in developing communication system at 60 GHz, especially in the context of WLAN (Wireless Local Area Network) and WPAN (Wireless Personal Area Network) systems for High Data Rate (HDR) wireless communications. The 60 GHz band provides abundance of bandwidth and is unmatched in any of the lower frequency bands. Cooperative communication networks have received significant interests from both academic and industry in the past decade due to its ability to provide spatial diversity without the need of implementing multiple transmit and/or receive antennas at the end-user terminals. These new communication networks have inspired novel ideas and approaches to find out what and how performance improvement can be provided with cooperative communications. This paper deals with providing performance improvement by mitigating detection errors at the relay using decode and forward (DAF) cooperative protocol. Comparison between the amplify-and-forward (AAF) cooperative transmission technique and the Decode and Forward cooperative transmission technique is encompassed. The paper examines a single relay network in which the channels considered are based on TSV model at 60 GHz. Performances based on different combining methods are evaluated. The effect of providing error detection capability at the relay on performance has been studied. The results indicate satisfactory diversity benefits offered by DAF cooperative diversity protocol as compared to single link transmission.

Keywords: AAF, BER, DAF, ESNRC, ERC, FRC, MRC, SNR, SNRC, TSV Model.