Delay spread and Doppler spread Estimation using Tracking Reference Signal

A Project Report

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THESIS CERTIFICATE

This is to certify that the thesis titled **Delay spread and doppler spread estimation using Tracking Reference signal** , submitted by **Haripriya Chandran**, to the Indian Institute of Technology, Madras, for the award of the degree of **Master of Technology**, is a bona fide record of the research work done by her under our supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

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ABSTRACT

KEYWORDS: ; 5G; OFDM;LS;CSIRS;TRS;Delay Spread;Doppler Spread.

5G NR(New Radio) is a new radio access technology developed by 3GPP for fifth generation mobile network.One of the reference signals introduced in 5G is CSIRS(channel state Information Reference Signals) which is a DL(Down-Link) only signal that helps the UE(user Equipment) to estimate the channel and report channel quality information back to the gNB(base station).TRS(Tracking Refernce signal) which is a subset of CSIRS is used for time and frquency tracking and also for delay and doppler spread estimation at the UE side.In this dissertation we deal with OFDM baseband system and propose a method to estimate the doppler spread and delay spread of the multipath fading channel using TRS.Delay spread is estimated using the PDP(power delay profile) which is obtained using the estimated CIR(channel impulse response) coefficients. Doppler Spread is estimated by using the time correlation function of the channel estimates.

CHAPTER 1

Due to confidentiality issues only abstract is uploaded. Complete thesis has been submitted to Dr. Radha Krishna Ganti. Kindly contact professor for full thesis

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