Continuous Phase Modulation (CPM): Optimum Signals and Performances

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by
K. R. RAVEENDRA

Department of Electrical Engineering,
Indian Institute of Technology, Delhi
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CERTIFICATE

This is to certify that the thesis entitled, "CONTINUOUS PHASE MODULATION (CPM) : OPTIMUM SIGNALS AND PERFORMANCES", which is being submitted by K.R.RAVEENDRA for the award of the degree of Doctor of Philosophy of the Indian Institute of Technology, Delhi, is a record of bonafide research work carried out by him under my guidance and supervision.

The candidate has fulfilled the requirements of all the regulations relating to the degree. The results contained in the thesis have not been submitted to any other University/Institute for the award of a degree or diploma.

Dr. Rajan Srinivasan
Department of Electrical Engineering
Indian Institute of Technology, Delhi
New Delhi 110016, INDIA

To

Amma

Appa

and my Mentor

ABSTRACT

This thesis represents a thorough investigation into the properties of digital Continuous Phase Modulation (CPM) signals, their optimum properties and the performances of their corresponding receivers. Broadly, two subclasses of CPM, multi-h CPM and Continuous Phase Chirp (CPC) signals, have been studied. The channels considered are Gaussian and non-Gaussian, employing both coherent as well as non-coherent receiver types. Optimum (power-efficient) signaling schemes have been obtained using the criteria of minimum error probability and Euclidean distance. Spectral comparisons of various signals have been made. From the point of view of easy implementation, simplifications have been effected in the structures of optimum receivers and a decision-directed receiver has been proposed and analysed.

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