

Iterative Frequency-Domain Packet Combining Techniques for UWB Systems with Strong Interference Levels

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Abstract UWB (Ultra Wideband) systems tend to suffer strong interference from signals that occupy a significant part of the transmission band. This is an important constraint, especially when the channel remains fixed for a long period of time. In order to overcome this limitation, this paper considers UWB systems employing Single-Carrier with Frequency-Domain Equalization techniques. We propose the corresponding receiver, which also allows the soft packet combining associated to different Automatic Repeat ReQuest transmission attempts, as a measure to improve the performance through the exploitation of diversity. Our techniques are able to cope with strong interference levels as well as deep fading, even for fixed channels.

Keywords ARQ techniques · Soft combining · Single-carrier modulations · Interference mitigation · Frequency-domain equalization · Ultra wide band systems

1 Introduction

UWB (Ultra Wideband) signals are characterized by bandwidths that can exceed 25 % of the central frequency of the spectrum [1]. Moreover, the low transmit powers combined with the

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