

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Complementary Coding Combining for OFDM	
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Re:	IEEE 802.16m-07/040 Call for Contributions on Project 802.16m SDD	
Abstract	Complementary Code Combining Soft Handoff has been adopted in cdma2000 standard for CDMA network. It is a well-known scheme for achieving both coding gain and diversity gain. We propose several complementary coding combining schemes for OFDM, which can help bring more diversity gains for the next generation system.	
Purpose	To be discussed and adopted by TGM for use in the 802.16m SDD.	
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Suggested ToC Topic for IEEE 802.16m SDD: Enhancements on Cell-edge Performance

Title: Complementary Code Combining Soft Handoff for OFDM

Description: Complementary Code Combining Soft Handoff has been adopted in cdma2000 standard for CDMA network. It is a well-known scheme for achieving both coding gain and diversity gain. One application example of it can be shown in Fig. 1 For mobile systems based on OFDM , some challenges exists for directly applying it. Mostly it is because of high channel estimation requirement of OFDM.

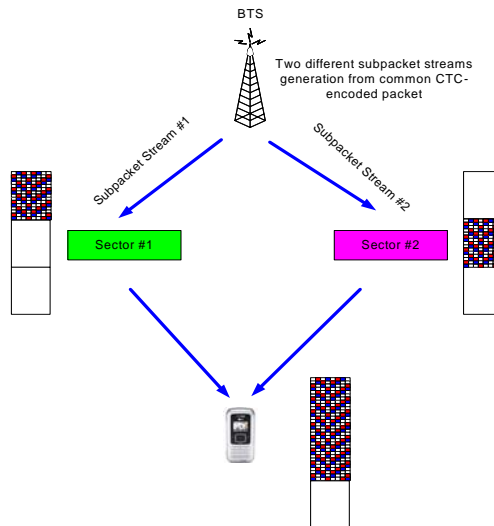


Figure 1 Code combining soft handoff or diversity

The tradeoff of the proposed schemes can be shown in the following table.

Proposed Approach	Pilot/Traffic Chan. within the cell	Pilot Channels between cells	Traffic Channels between cells	Performance		
				Spectral Efficiency	Chan. Esti. Complexity	Demod. Complexity
I	TDM/FDM/OFDM	TDM/FDM/OFDM	TDM/FDM/OFDM	Low	Low	Low
II	SIP	TDM/FDM/OFDM	TDM/FDM/OFDM	Middle	High	Middle
III	TDM/FDM/OFDM	TDM/FDM/OFDM	overlapped	High	Low	High
IV	TDM/FDM/OFDM	CMP	overlapped	Highest	Middle	High

There are certain pros and cons for these four approaches. Orthogonal multiplexing approaches, such as TDM/FDM/OFDM, come with low receiver complexity as well as low spectral efficiency. Nonorthogonal multiplexing approaches, such as SIP and CMP, have high receiver complexity and high spectral efficiency.

Related Area(s) in SRD: Section 7.1.1: Relative performance (cell-edge user throughput), Section 7.1.2: Absolute performance (cell-edge user throughput), and Section 7.4: Cell coverage