Project	**IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>**
Title	**ACK/NACK Response Combining in a Multi-BS MIMO Configuration**
Date Submitted	**2009-01-05**
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Re:	802.16m-08/052 Call for Comments on Project 802.16m System Description Document (SDD)
Abstract	This contribution proposes text to allow combining ACK/NACK response signals in a multi-BS MIMO configuration.
Purpose	Adopt the proposed text into the latest revision of C802.16m-08/003 (SDD).
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ACK/NACK Response Combining in a Multi-BS MIMO Configuration

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Introduction

This contribution proposes combining ACK/NACK transmissions from an MS in a multi-BS MIMO configuration, to improve the robustness of the ACK/NACK signal.

Background

In DL HARQ, when a cell transmits a data packet in a HARQ process to a communicating MS, the MS sends one ACK/NACK for each HARQ process in response.

When cooperating cells receive the UL transmitted signal from a UE, the received multiple replica of the signal at the individual cells may be combined in several ways. For instance, a primary cell may collect the multiple replica and combine them in a coherent manner. This yields an increase in the reception quality, for example, in terms of SNR.

Recommendation

When one ACK/NACK response is sent in the uplink, it may be combined by all (or some of) the cooperating cells to increase the reliability of decoding the ACK/NACK channel. The method for combining the received multiple replica of the ACK/NACK depends on the network architecture in UL.

SDD Proposal

---------- Proposed SDD text ----------

Modify the SDD [1] as indicated:

11.9.1.3 HARQ feedback

HARQ feedback (ACK/NACK) is used to acknowledge DL transmissions. Multiple codewords in MIMO transmission can be acknowledged in a single ACK/NACK transmission.

In a multi-BS MIMO configuration, ACK/NACK responses received by BSs may be combined to improve the robustness of the ACK/NACK signal.

---------- End proposed SDD text ----------

References

[1] IEEE 802.16m-08/003r6, The Draft IEEE 802.16m System Description Document