Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Effective CQI Feedback for Multi-BS MIMO**
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Re:	802.16m-08/052 Call for Comments on Project 802.16m System Description Document (SDD).
Abstract	This contribution proposes an effective CQI feedback for multi-BS MIMO configurations, reducing the amount of feedback required.
Purpose	Adopt the proposed text into the SDD.
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Effective CQI Feedback for Multi-BS MIMO

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Introduction

The SDD [1] section 11.9.1.1 describes channel quality feedback mechanisms. Specifically, it says "CQI feedback overhead reduction is supported through differential feedback or other compression techniques." For closed-loop multi-BS MIMO, where the feedback information may be shared by neighboring base stations via the network interface (e.g. C-RRM-RSP), it is desirable to reduce the amount of feedback. This contribution proposes a feedback mechanism that reduces the amount of CQI feedback information required.

Resource Group Effective CQI

One way to reduce feedback overhead is to have one "effective" CQI per resource group. The effective CQI represents the quality of the effective channel from all cooperating BSs. For example, two cooperating BSs transmit using the same resource groups. The MS computes an effective CQI per resource group, and, in this case, the amount of feedback is reduced.

There are many approaches to computing the effective SINR from which the CQI can be derived. The CQI typically is an index to an element in the CQI table. The effective CQI value represents the composite channel quality for a given resource group and the receiver characteristics.

A single effective CQI could be useful when the network rank is one, i.e., all cooperating cells transmit the same modulation symbols. When an effective CQI is computed, all cooperating cells use the same coding rate and modulation and transmit on the same resource groups.

With an effective CQI, the MS feeds back the CQI values (one for each resource block or group) and a label that indicates the indices of the resource groups for which the CQIs are computed. The label and CQI values are common for all cooperating cells. This reduces the feedback overhead.

Recommended Text

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

Modify the text as indicated:

Multi-BS MIMO techniques are supported for improving sector throughput and cell-edge throughput through multi-BS collaborative precoding, network coordinated beamforming, or inter-cell interference nulling. Both open-loop and closed-loop multi-BS MIMO techniques can be considered. For closed-loop multi-BS MIMO, CSI feedback via codebook based feedback or sounding channel will be used. The feedback information may be shared by neighboring base stations via network interface. For multi-BS MIMO where the BSs may transmit to the MS on the same resources, the MS may be instructed to use an effective CQI feedback report, which represents the composite transmission of the multiple BSs transmitting on the same resources. Mode adaptation between single-BS MIMO and multi-BS MIMO is utilized.

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

References

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