

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >	
Title	<b>SDD Text Proposal for Opportunistic UL Sounding in IEEE 802.16m</b>	
Date Submitted	<b>2008-09-05</b>	
Source(s)	Peter Wang, Shaohua Li, Xin Qi, Adrian Boariu, Joon Chun Nokia Siemens Networks Zexian Li, Andrei Malkov Nokia	E-mail: <a href="mailto:peter.wang@nsn.com">peter.wang@nsn.com</a>    <a href="mailto:zexian.li@nokia.com">zexian.li@nokia.com</a>
Re:	Call for Comments on IEEE 802.16m-08/003r4 System Description Document (SDD)  Target Topic: UL control channels	
Abstract	This contribution proposes SDD text proposal for UL sounding channel.	
Purpose	Comments to SDD	
Notice	<i>This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups. It represents only the views of the participants listed in the "Source(s)" field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who reserve(s) the right to add, amend or withdraw material contained herein.</i>	
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.	
Patent Policy	The contributor is familiar with the IEEE-SA Patent Policy and Procedures: < <a href="http://standards.ieee.org/guides/bylaws/sect6-7.html#6">http://standards.ieee.org/guides/bylaws/sect6-7.html#6</a> > and < <a href="http://standards.ieee.org/guides/opman/sect6.html#6.3">http://standards.ieee.org/guides/opman/sect6.html#6.3</a> >. Further information is located at < <a href="http://standards.ieee.org/board/pat/pat-material.html">http://standards.ieee.org/board/pat/pat-material.html</a> > and < <a href="http://standards.ieee.org/board/pat">http://standards.ieee.org/board/pat</a> >.	

# Opportunistic UL Sounding in IEEE 802.16m

Nokia Siemens Networks

Nokia

## 1. Purpose

In order to have an efficient UL MIMO feedback from multiple users in the cell, we propose that BS broadcasts SNR threshold and multiple MSs response through CDM sounding feedback. This contribution gives some consideration on UL MIMO sounding channel design and with modified text to SDD.

## 2. The UL sounding for MU-MIMO

The procedures of CL MU-MIMO can be categorized into three steps shown in Figure 1.

- (1) BS broadcasts SNR threshold value to the active MSs dynamically.
- (2) MS compares its average channel measurement to the reference of broadcast SNR threshold. If the channel measurement is greater than the threshold value, the MS feedbacks its specific CDM sequence to BS in the specific UL sounding channel.
- (3) BS collects multiple MS's opportunistic channel feedback information and then schedules MU-MIMO scheme.

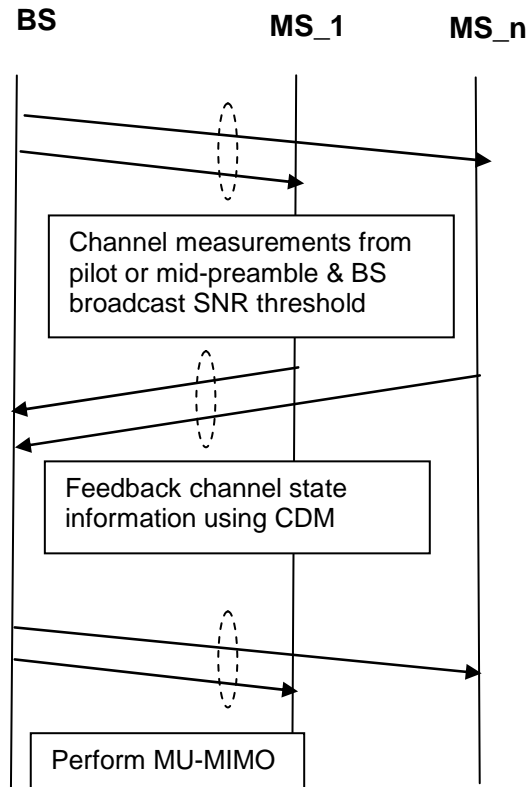


Figure 1. The procedures of CL MU-MIMO scheme

## 4 Proposed Text for SDD

-----Start of the text-----

### 11.9.2.3 UL Sounding Channel

The UL sounding channel is used by an MS to send a sounding signal for MIMO feedback, channel quality feedback and acquiring UL channel information at the BS.

#### 11.9.2.3.1 Multiplexing with other control information and data

The BS can configure an MS to transmit an UL sounding signal on specific UL sub-bands. The sounding signal is transmitted over predefined subcarriers within the intended sub-bands. The periodicity of the sounding signal for each MS is configurable.

The UL sounding channel is FDM with other control and data channels.

#### 11.9.2.3.x Multiplexing sounding feedback for multiple users/antennas

The BS can configure multiple MSs to transmit UL sounding signals on specific UL sounding channels. The UL sounding channels from multiple users or multiple antennas of users are CDM.

#### 11.9.2.3.x.x Opportunistic UL sounding

BS broadcasts SNR threshold value to the MSs. MS compares its average DL channel measurement to the reference SNR threshold. If the channel measurement is greater than the threshold value, the MS feedbacks its CDM sequence to BS in the specific UL sounding channel.

-----End of the text-----