

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >		
Title	<b>Power control for inter-cell interference mitigation</b>		
Date Submitted	<b>2008-07 -07</b>		
Source(s)	Mariana Goldhamer Alvarion ltd. 21A, Ha Barzel Street Tel Aviv	E-mail:	<a href="mailto:mariana.goldhamer@alvarion.com">mariana.goldhamer@alvarion.com</a>
Re:	16m Call for Contributions on Power control		
Abstract	Proposed 802.16m power rules for interference mitigation		
Purpose	Actions: 1. Modification of ToC 2. Capture of the text in the 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> >.		

# Power control for inter-cell interference mitigation

Mariana Goldhamer  
Alvarion Ltd.

## Introduction

The interference mitigation is optimal when using dedicated frequency and time resources at cell edge, for each of the strong interfering sectors. In the same time, the maximum frequency efficiency is obtained when at least part of resources are used in a shared mode.

We define the power control rules for the coordinated inter-cell interference mitigation, presented within the contribution [1]. This approach assumes:

- Allocation of resources for shared and dedicated OFDMA SETs
- Inter-cell coordination for dynamic modification of these resources.
- 

Fig. 1 is a high level illustration of this approach for the down-link operation.

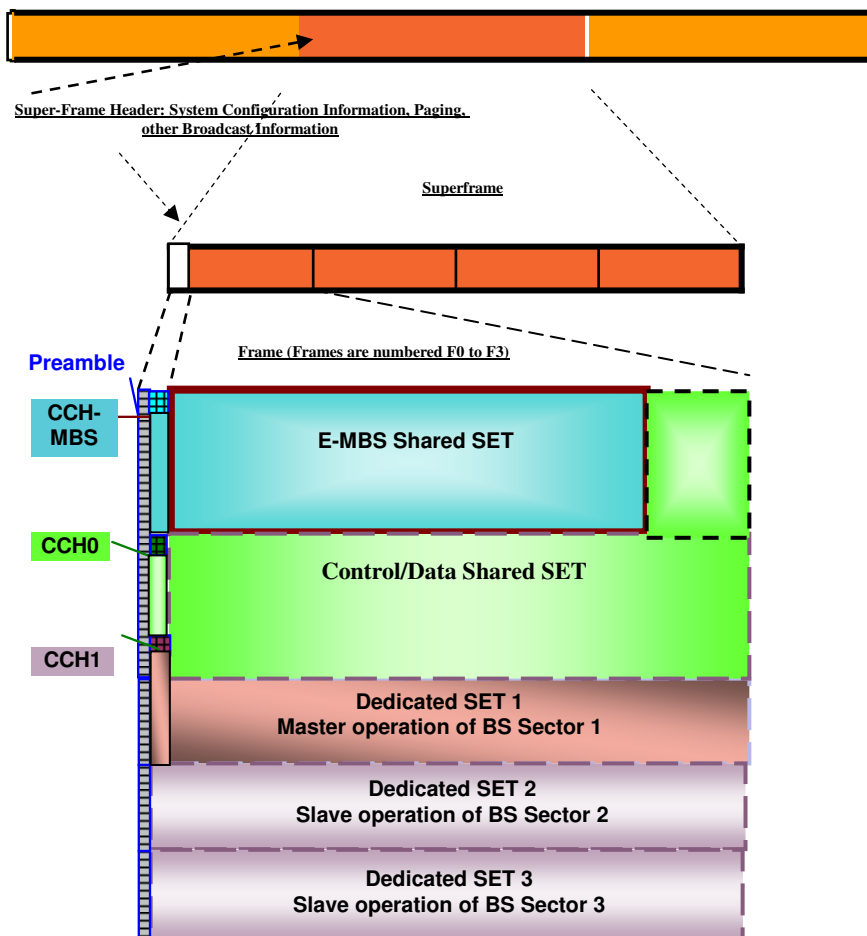


Fig. 1 Downlink channel splitting in SETs, as seen by BS Sector 1

*From here insert text for SDD*

#### 11.4.8.x Power control rules

Fig. xx provides an example of Shared and Master/Slave partitions, for a three sectors deployment.

Fig. xx presents an example of the power distribution between sectors. The Master SETs can use a high power density, while the Slave SETs use a limited power density. The Shared Control/Data SET may be also limited to a certain level of power density. The power density of the E-MBS SET transmissions should be higher, as generally the H-ARQ is not used for broadcast services.

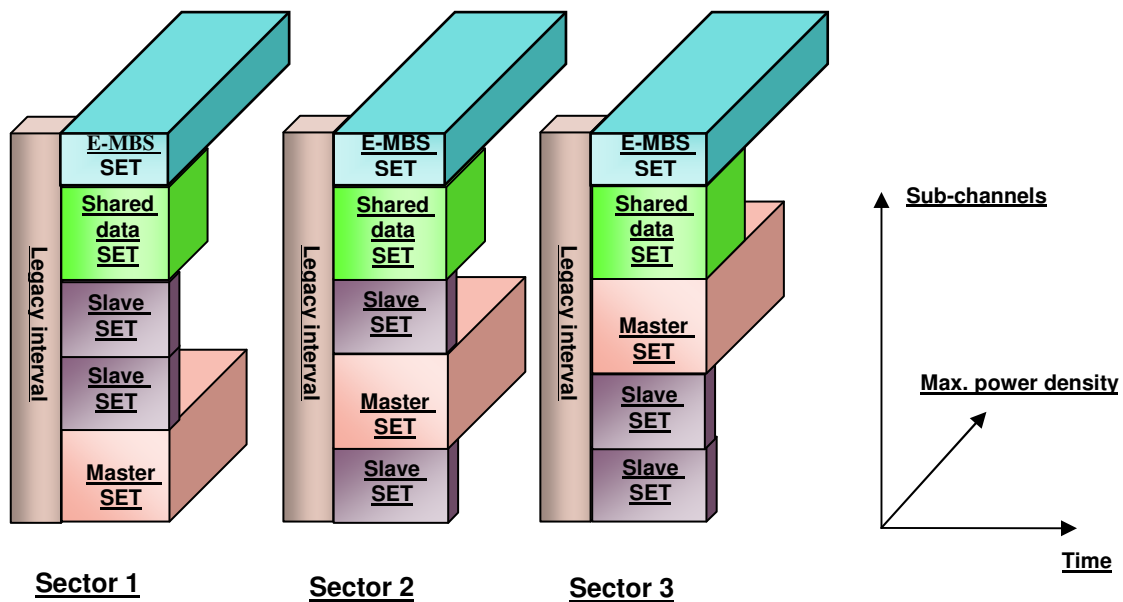


Fig. xx – Example of possible power density distribution for SETs

As can be seen in fig. xx, the dedicated Master SETs use a high power density in order to provide coverage at the cell margin, while the Slave SETs use a lower power such to avoid creating interference to the systems utilizing the same SET as Master.

In case of using MIMO technologies for inter-cell interference mitigation or for cooperative data transmission, it is suitable to increase the power for the used sub-channels in Shared or Slave allocations, such that the coverage will be extended to cover the cell margin.

The following example (fig. yy) shows a case of power increase for a part of a Shared SET, dedicated for MIMO-based interference cancellation, as well for a collaborative MIMO using the dedicated (Master) SETs allocated for Sector 1 and using collaborative MIMO for the same OFDMA allocation used as Slave by sectors 2 and 3.

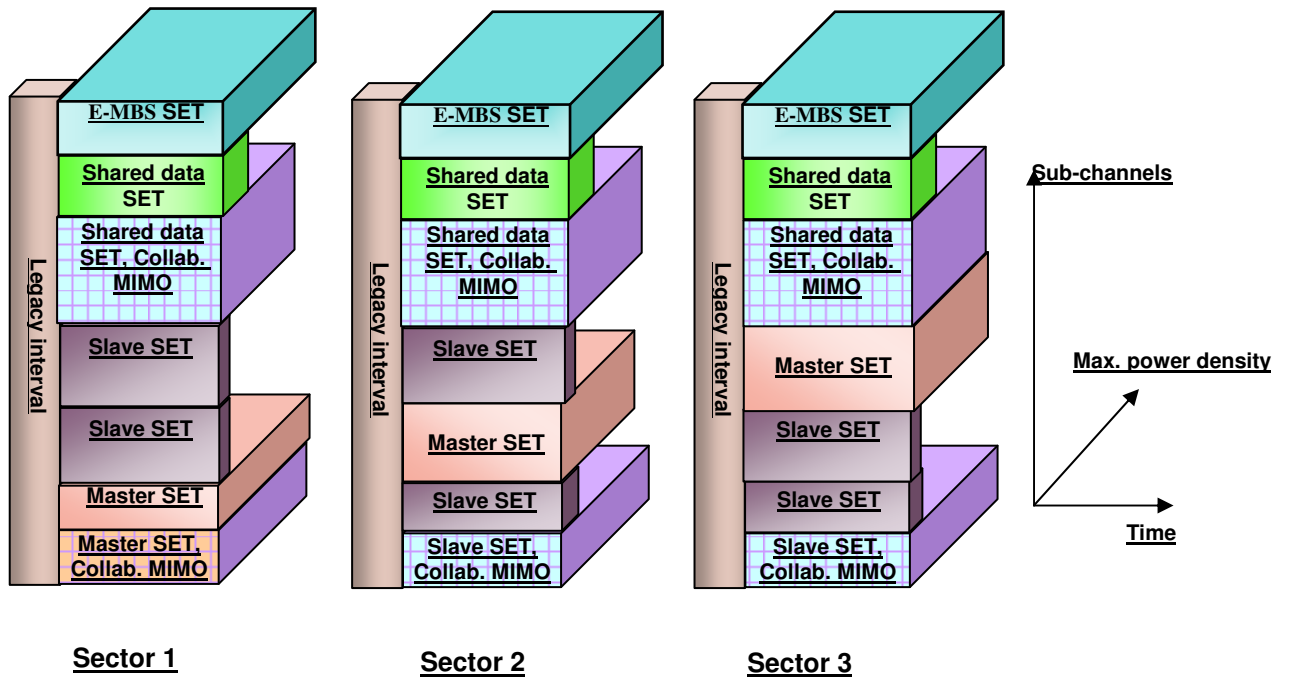


Fig. yy – Example of possible power density distribution for SETs using collaborative MIMO

Note that for keeping the same cell size the BS total power should be increased.

*End text insertion*

## References

- [1] Mariana Goldhamer, IEEE C802.16m-08/602: Coordinated approach for inter-cell interference management