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Abstract	AMC subchannel subcarrier allocation enhancements
Purpose	Adoption of proposed changes into P802.16-REVd/D4-2004
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1 Introduction

For AAS and AMC subchannel, there is no consideration to identify the cell specific subchannel. In other words, the current subcarrier allocation may allocate same subcarriers for a AAS or AMC subchannels in different cell. In case of FUSC, it may cause to fail decoding target signal even with reasonable SINR.

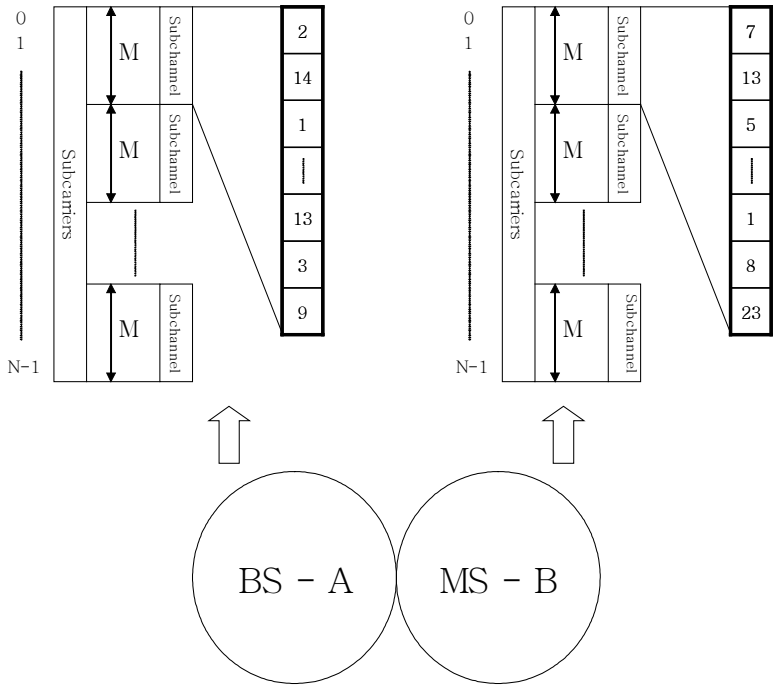
2 Proposed scheme

A subcarrier permutation for band AMC subchannel is proposed to identify AMC subchannel of a cell/sector. For diversity subchannel, the location of subcarriers are cell/sector specific. For AMC subchannel, the location of subcarriers may coincide with other AMC subchannel for the same band. In case of FUSC, it may cause to fail decoding target signal even with reasonable SINR. Now consider the following case. Two information bit sequence with same length are encoded and modulated identically (same AMC level) in the neighboring cells. Further, the subchannels with same subcarriers are allocated for the encoded and modulated sequence and the order of the subcarrier mapping coincides. In this case, one may have the following signal at the input to the FEC decoder (For simplicity, noise is ignored).

$r = H_1 C_1 + H_2 C_2$

C_1 and C_2 are the encoded bit sequence for the two information bit sequences. H_1 and H_2 are channel responses (for simplicity, assuming that H_1 and H_2 are real values). In this case, the conventional decoder can only decode one of C1 and C2, depending the magnitude of H1 and H2. When C_1 is the signal from the serving BS and $H_1 < H_2$, the MS loses the packet.

We propose to change the orders of subcarrier mapping within a AMC subchannel. The figure below illustrates the concept of subcarrier permutation. RS sequence defined GF(49) is used to provide systematic permutation per cell/sector.



3 Suggested text change

[Add the following at the end of 8.4.6.3]

Let the index of the traffic subcarriers be numbered from 0 to 47 within an AMC subchannel. The index of first traffic subcarrier in the first bin is 1, next one is 2 and so on. The index of the subcarriers increases along the subcarriers first then the bin. The j-th symbol of the 48 symbols where a band AMC subchannel is allocated is mapped onto the ($S_{per}^{off}(j)$ -1)-th subcarrier of a subchannel. j is [0, 47].

$$S_{per}^{off}(j) = \begin{cases} P_{per}(j) + off & P_{per}(j) + off \neq 0 \\ off & P_{per}(j) + off = 0 \end{cases}$$

where

$P_{per}(j)$	The j-th element of the left cyclic shifted version of basic sequence P_0 by per
P_0	Basic sequence defined in GF(7^2): {01, 22, 46, 52, 42, 41, 26, 50, 05, 33, 62, 43, 63, 65, 32, 40, 04, 11, 23, 61, 21, 24, 13, 60, 06, 55, 31, 25, 35, 36, 51, 20, 02, 44, 15, 34, 14, 12, 45, 30, 03, 66, 54, 16, 56, 53, 64, 10} in hepta-notation.

$per = ID_{cell} \mod 48$

$off = \left(\left\lceil ID_{cell} \div 48 \right\rceil\right) \mod 49$

$n \mod m$	Remainder of n÷m.
$\lceil X \rceil$	The largest integer not greater than X.

The addition between two element in GF(7^2) is component-wise addition modulo 7 of two representation. For example, (56) + (34) in GF(7^2) = (13).