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Title	<b>Correction of inconsistencies in 802.16-2004 OFDMA mode repetitions and data mapping to burst</b>	
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## Correction of inconsistencies in 802.16-2004 OFDMA mode repetitions and data mapping to burst

### 1 Statement of the problem

In section 8.4.9.2 the word sub-channel is used instead of slot, which would imply that FEC block concatenation is done in the frequency dimension. The same applies to repetition coding that is defined in section 8.4.9. This direction of mapping is inconsistent with the direction of mapping defined in section 8.4.3.4

### 2 Proposed solution

Solve inconsistency by defining the direction of concatenation, repetition and mapping to be in units of slots and in a frequency first manner.

### 3 Specific text changes

*[Modify the text on page 590, line 32-47 as shown below]*

#### 8.4.9 Channel coding

Channel coding procedures include randomization (see 8.4.9.1), FEC encoding (see 8.4.9.2), bit interleaving (see 8.4.9.3), and modulation (see 8.4.9.4). When repetition code is used, allocation for the transmission shall always include an even number of adjacent **Subchannels slots**. The basic block shall pass the regular coding chain where the first **Subchannel slot** shall set the randomization seed used in 8.4.9.1, and the data shall follow the coding chain up to the Mapping. The data outputted from the modulation (8.4.9.4) **prior to multiplication by the modulation PRBS (8.4.9.4.1)** shall be mapped onto the block of **subchannels slots** allocated for the basic block and then it will be also mapped on the following consecutive allocated **Subchannels slots** (for repetition coding of 2 another block of **subchannels slots** of the same size is used, for repetition coding of 4 another 3 blocks of **subchannels slots** of the same size are used and for repetition of 6 another 5 blocks of **subchannels slots** of the same size are used), the process of regular encoding and repetition encoding is shown in Figure 252. The direction of slot concatenation defined in the FEC encoding (see 8.4.9.2) and the repetitions shall be according to 8.4.4.3.

*[Modify the text in figure 252: replace the word 'sub-channel' with word 'slot' (5 replacements)]*

*[Starting from page 592 line 25 to page 593 line 23: replace the word 'sub-channel' with word 'slot' (14 replacements)]*

*[Starting from page 598 line 49 to page 599 line 52: replace the word 'sub-channel' with word 'slot' (16 replacements)]*

*[Modify the text on page 620, line 48-50 as shown below]*

The constellation-mapped data shall be subsequently modulated onto the allocated data subcarriers and each subcarrier multiplied by the factor  $2^{*(1/2 - w_i)}$  according to the subcarrier index,  $k$ . Repetitions are applied before multiplication with the factor  $2^{*(1/2 - w_i)}$ .

*[Modify the text on page 499, line 33-65 as shown below]*

#### 8.4.3.4 OFDMA data mapping

MAC data shall be processed as described in 8.4.9 and shall be mapped to an OFDMA Data Region (see 8.4.3.1) for downlink and uplink using the algorithms defined below.

Downlink:

- 1) Segment the data into blocks sized to fit into one OFDMA slot.
- 2) Each slot shall span one or more subchannels in the subchannel axis and ~~two~~ **one or more** OFDMA symbols in the time axis (see Figure 216), as per the specific slot used. Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.

3) Continue the mapping such that the OFDMA ~~symbol~~ subchannel index is increased. When the edge of the Data Region is reached, continue the mapping from the lowest numbered OFDMA ~~symbol~~ subchannel in the next ~~subchannel~~ available symbol.

Uplink:

The UL mapping consists of two steps. In the first the OFDMA slots allocated to each burst are selected. In the second steps the allocated slots are mapped.

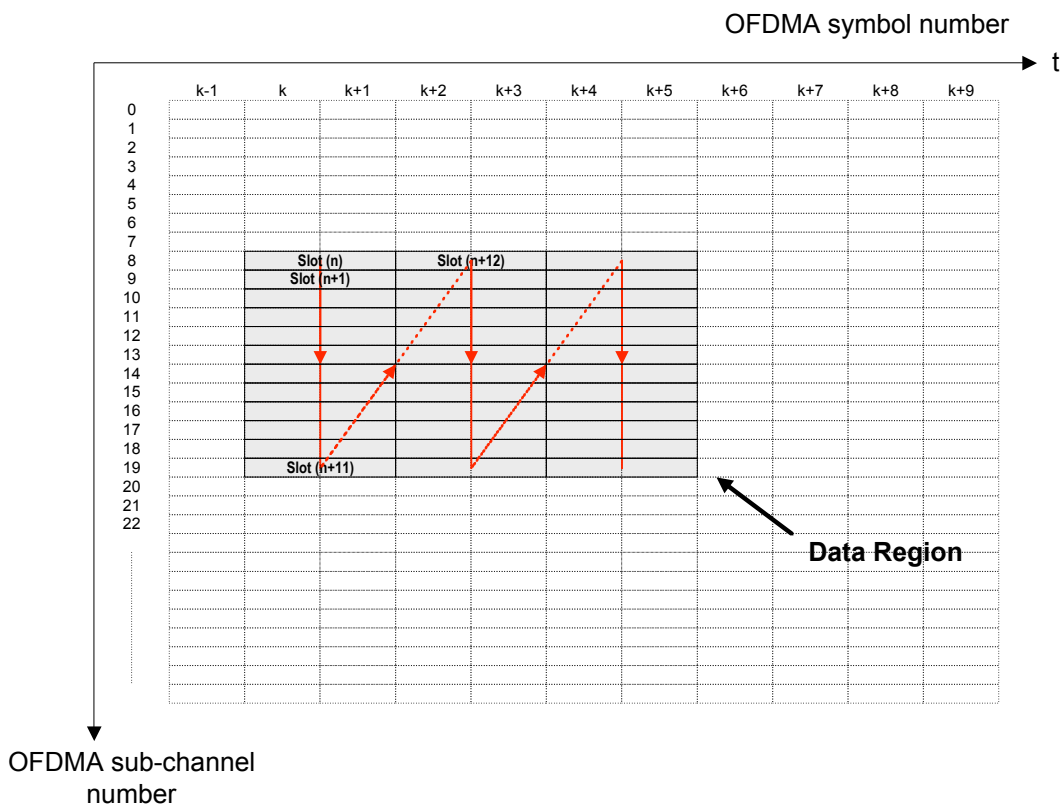
A. Step 1 – allocate OFDMA slots to bursts

- 1) Segment the data into blocks sized to fit into one OFDMA slot.
- 2) Each slot shall span one or more subchannels in the subchannel axis and three OFDMA symbol in the time axis (see Figure 217).
- 3) Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.
- 4) An UL allocation is created by selecting an integer number of contiguous slots, according to the ordering of steps 1-3. This results in the general Burst structure shown by the gray area in figure 217.

B. Step 2 – Map OFDMA slots within the UL allocation.

- 1) Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.
- 2) Continue the mapping such that the Subchannel index is increased. When the last subchannel is reached, continue the mapping from the lowest numbered subchannel in the next OFDMA symbol that belongs to the UL allocation. The resulting order is shown by the arrows in figure 217.

[Replace figure 216 with the figure shown below]



[Replace figure 217 with the figure shown below]

