

## Proposal for Constellation Re-arrangement in IR HARQ

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None

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To be discussed and adopted by TGm for use in 802.16m SDD

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# Proposal for Constellation Re-arrangement in IR HARQ

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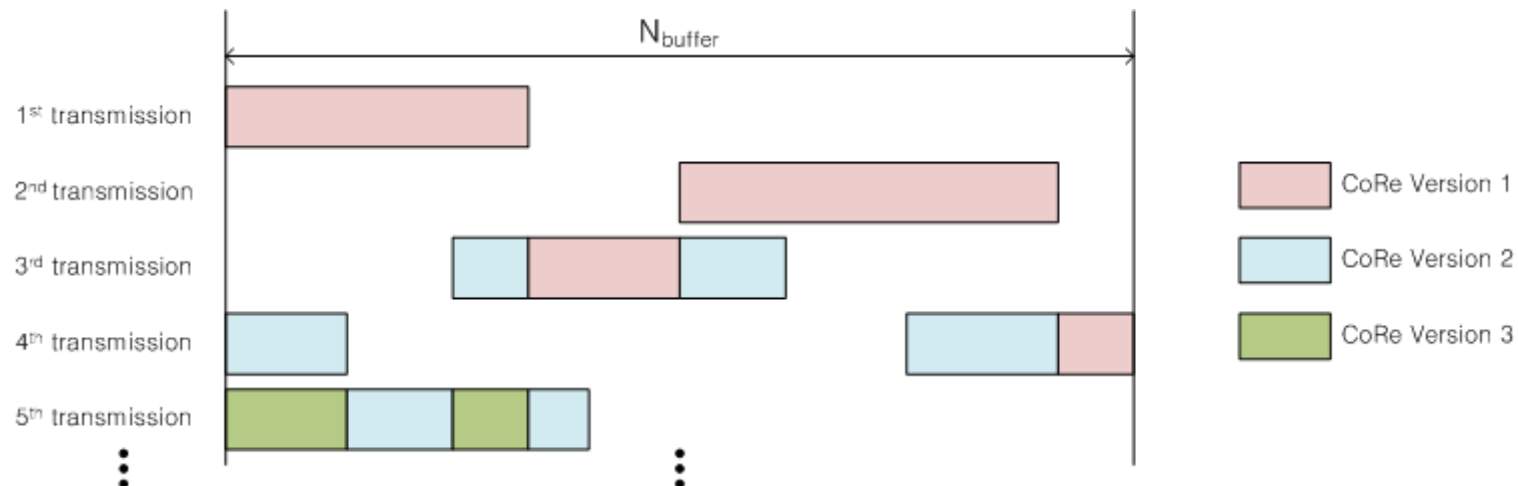
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# About This Contribution

- Goal and scope of this contribution
  - Propose a constellation re-arrangement operation in IR HARQ for 802.16m
- Issue to be addressed in this contribution
  - Potential problem of current constellation re-arrangement scheme
  - New constellation re-arrangement operation

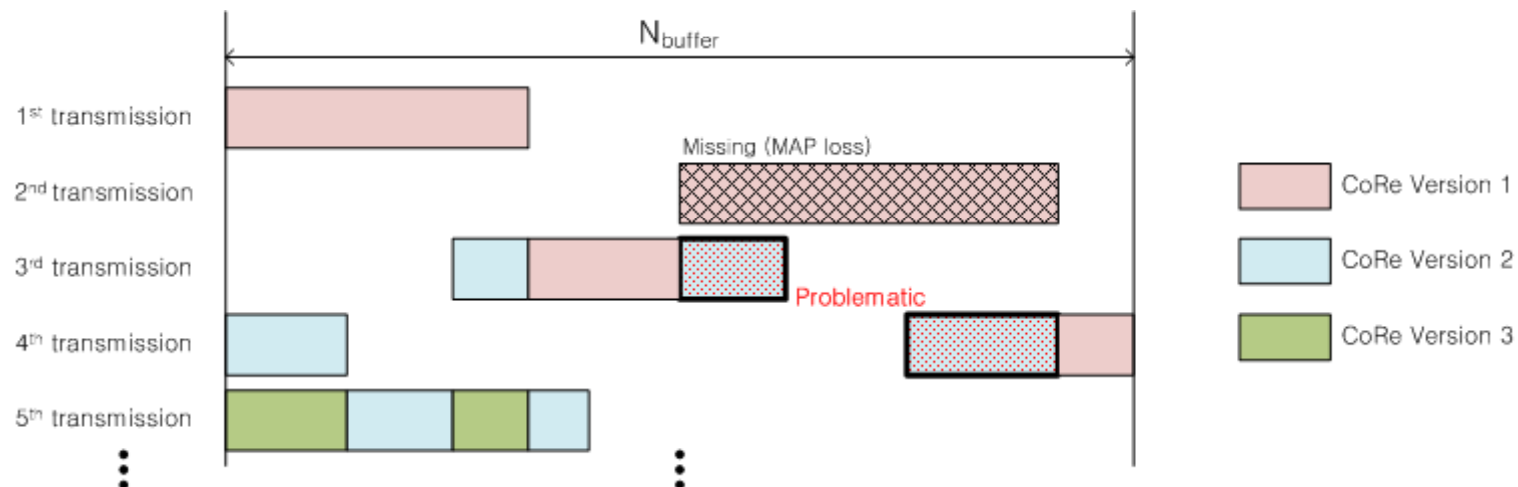
# Current HARQ & CoRe operation

- Incremental redundancy (IR) is a mandatory Hybrid-ARQ (HARQ) operation for 802.16m
  - Chase Combining(CC) is a special case of IR HARQ
- Constellation re-arrangement (Co-Re) is supported in 802.16m. For each transmitted bit, the CoRe-version is selected by the transmission number of this bit. The specific selection mechanism is FFS.



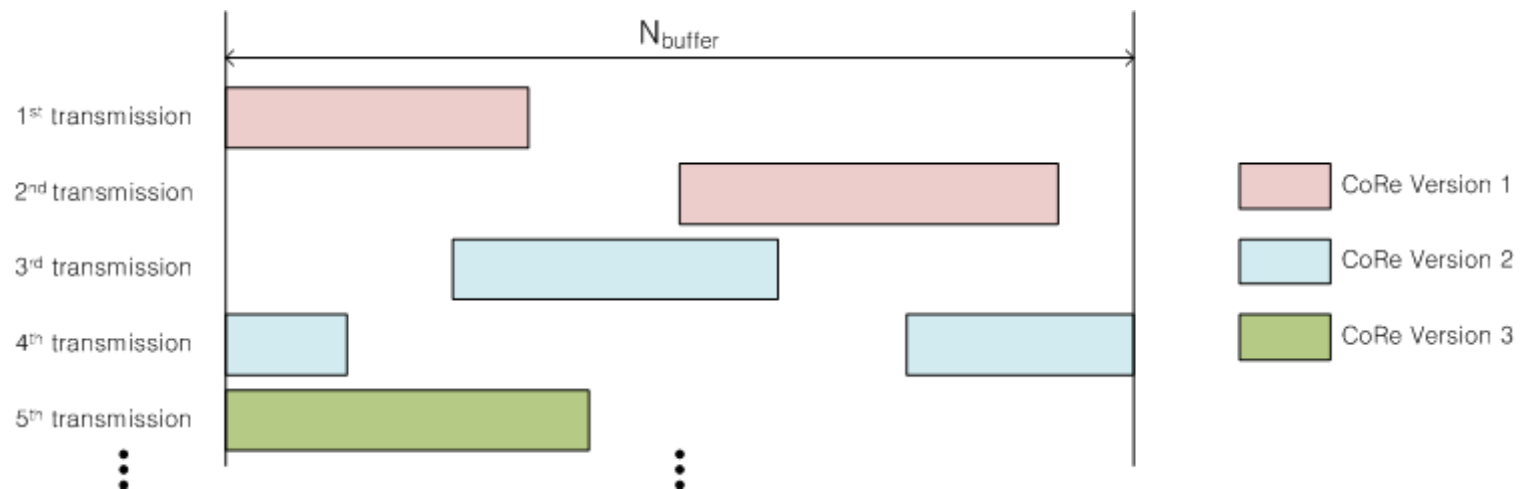
# Problem of Current Co-Re Operation

- Current Co-Re operation has a problem in case of IR-HARQ and adaptive HARQ.
  - If the MAP is missing, the MS can't know the CoRe-version for each transmitted bit.
  - In IR and adaptive HARQ operation, this problem is critical.
  - For each transmitted bit, the CoRe-version may be indicated, but the overhead is large.



# Proposed Co-Re Operation

- In the proposed scheme, all the modulated symbols in a HARQ re-transmission use same CoRe-version.
  - Robust Co-Re operation in case of MAP loss
  - No additional overhead for CoRe operation



# Text Proposal to 802.16m SDD

*Modify Chapter 11.13.2.2 in IEEE 802.16m-08/003r5 as follows;*

## **11.13.2.2 Constellation re-arrangement**

Constellation re-arrangement (Co-Re) is supported in 802.16m. ~~For each transmitted bit, the CoRe version is selected by the transmission number of this bit.~~ All the QAM symbols in the same HARQ re-transmission use same Co-Re version.  
The specific selection mechanism is FFS.