



# AHG6: ALF with modified padding process

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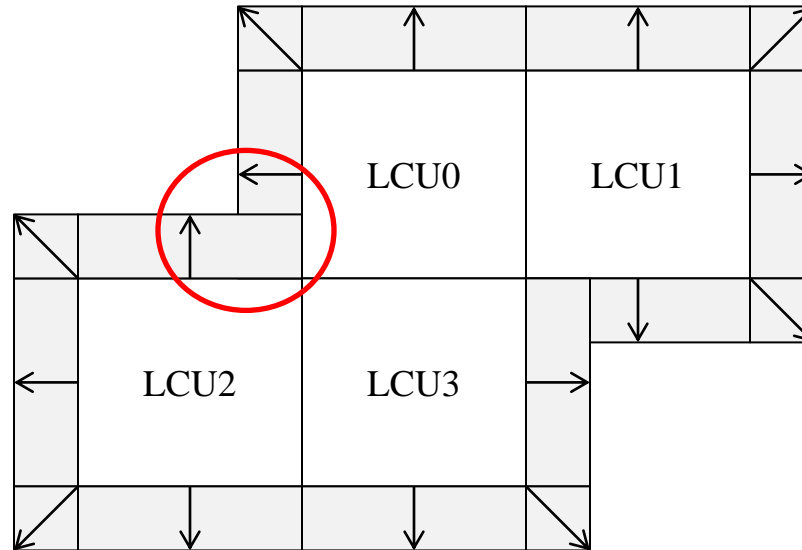


Presented by Yu-Wen Huang  
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# Overall Summary

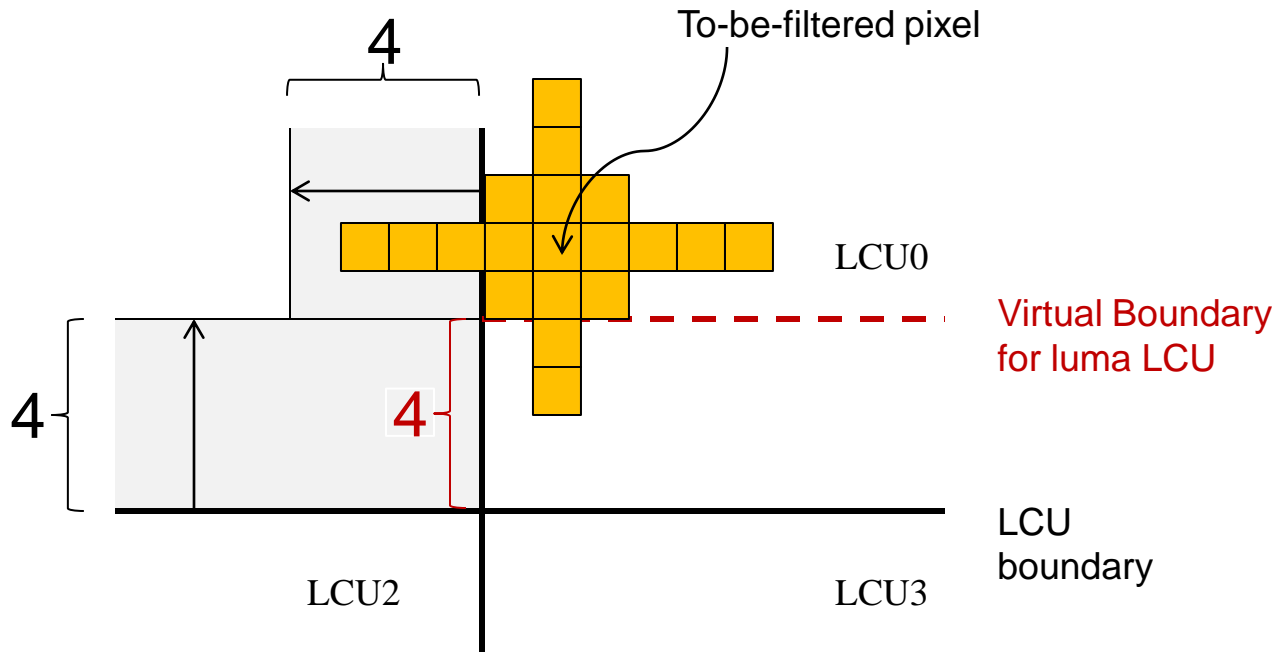
- Padding principle
  - In HM, a later block in processing order has a **higher** priority than a prior block to extend boundary samples when the two blocks have an overlapping to-be-padded area
  - In the proposed method, a later block in processing order has a **lower** priority than a prior block
  - To solve a chroma line buffer issue
  - Only 2 lines in HM are modified; text is simplified.
  - No BD-rate change
- Number of vertically padded samples
  - In HM, the vertical size of the filter footprint has been reduced from 9 to 7, but the number of vertically padded samples is still 4.
  - Propose to reduce the number of vertically padded samples to **3**
  - Only 7 lines in HM are modified.
  - No BD-rate change

# HM-7.0: ALF Boundary Padding



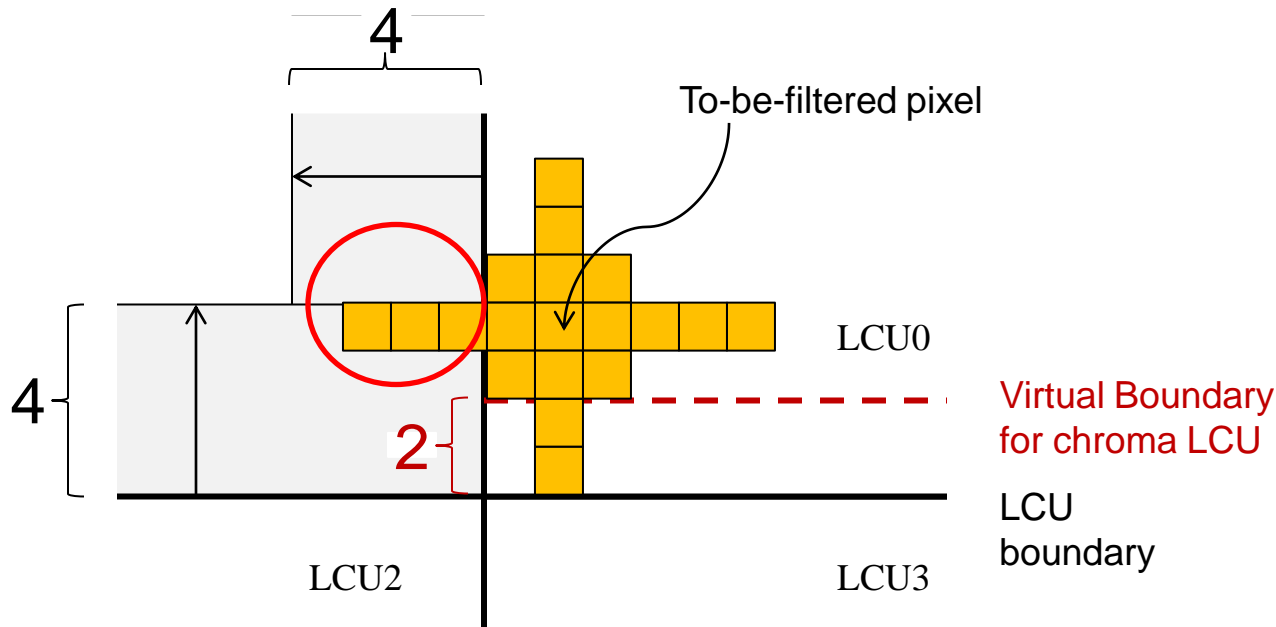
- LCU0, LCU1, LCU2, LCU3: SAO output
- The slice boundary corner pixels (red circle) may cause line buffer problem for LCU-pipelining.

# HM-7.0, When luma LCU0 is processed



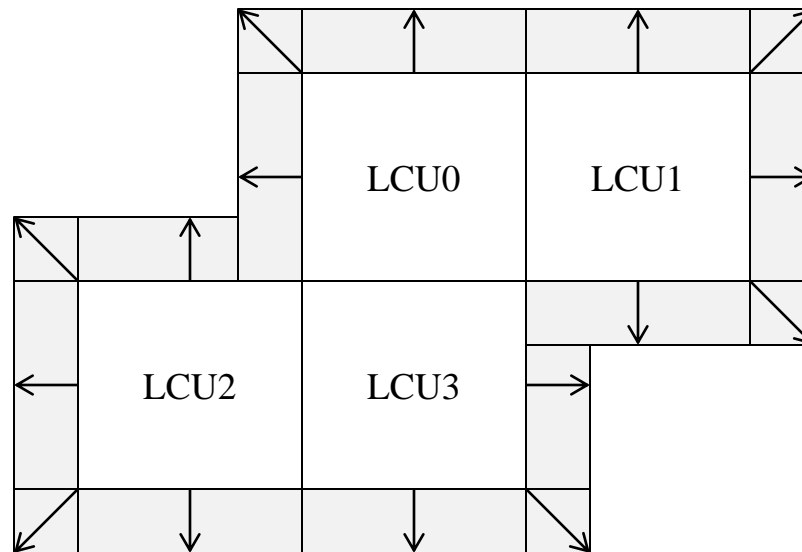
- No problem.
- Those to-be-filtered samples above virtual boundary will not use the padding results derived from LCU2 .

# HM-7.0, When chroma LCU0 is processed



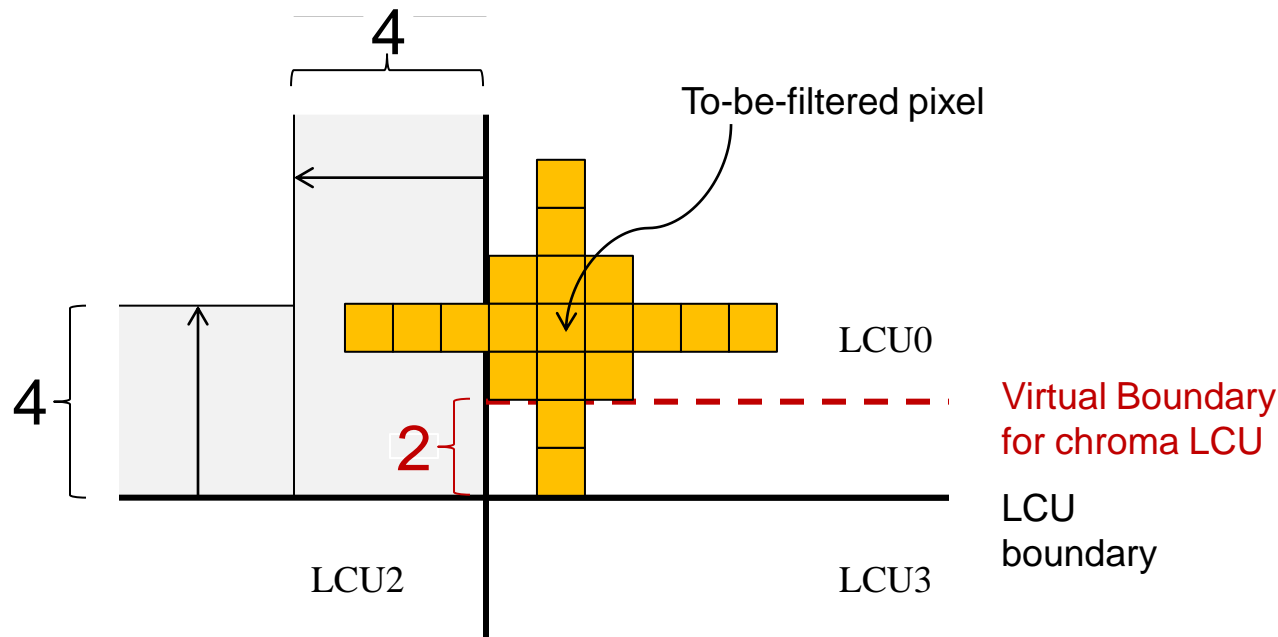
- Problematic
- Some to-be-filtered pixels above virtual boundary need the padding results derived from LCU2 (red circle) which are not ready.

# Proposed ALF Boundary Padding



- A later block in processing order has a **lower** priority than a prior block to extend boundary samples when the two blocks have an overlapping to-be-padded area.

# When chroma LCU0 is processed



- No problem after applying the proposed padding principle
- Those to-be-filtered samples above virtual boundary will not use the padding results derived from LCU2.

# Proposed Number of Padded Samples

- ALF filter shape: 9x7cross+3x3square
- Number of vertically padded samples: 4
- Proposed to reduce to 3



# Conclusion

- Propose to change the padding principle
  - To solve a chroma line buffer issue
  - A later block in processing order has a **lower** priority than a prior block to extend boundary samples when the two blocks have an overlapping to-be-padded area
  - Only 2-line change in HM
  - Simpler text
  - Also applicable for fine granularity slice
  - No BD-rate change
- Propose to reduce the number of vertically padded samples to 3
  - To fit the filter shape
  - No BD-rate change