

WHAT IS CLAIMED IS:

1. A method of video decoding at a video decoder, comprising:
  - receiving a first high level syntax (HLS) element indicating whether an explicit multiple transform selection (MTS) is enabled or disabled for an intra coded block;
  - receiving a second HLS element indicating whether the explicit MTS is enabled or disabled for an inter coded block, wherein the first and second HLS elements control a same set of coding blocks that include the intra coded block and the inter coded block; and
  - enabling an implicit MTS for the intra coded block when the first HLS element indicates the explicit MTS is disabled for the intra coded block and the second HLS element indicates the explicit MTS is enabled for the inter coded block.
2. The method of claim 1, further comprising:
  - applying the implicit MTS to the intra coded block, wherein a transform type for processing the intra coded block is determined according to a size of the intra coded block.
3. The method of claim 1, wherein the first or second HLS element is one of:
  - a video parameter set (VPS) syntax element,
  - a sequence parameter set (SPS) syntax element,
  - a picture parameter set (PPS) syntax element,
  - a slice header syntax element,
  - a tile header syntax element, or
  - a tile group header syntax element.
4. The method of claim 1, wherein the intra coded block is not coded with an intra sub-partitioning (ISP) mode.
5. The method of claim 1, further comprising:
  - receiving a third HLS element indicating an MTS is enabled for each of the inter and intra coded blocks.
6. A method of video decoding at a video decoder, comprising:

receiving a first high level syntax (HLS) element indicating whether an explicit multiple transform selection (MTS) is enabled or disabled for an intra coded block;

receiving a second HLS element indicating whether a Non-separable Secondary Transform (NSST) or matrix-based intra prediction (MIP) is disabled or enabled for the intra coded block; and

enabling an implicit MTS for the intra coded block when the first HLS element indicates the explicit MTS is disabled for the intra coded block, and the second HLS element indicates the NSST or the MIP is disabled for the intra coded block.

7. The method of claim 6, further comprising:

disabling the implicit MTS for the intra coded block when the first HLS element indicates the explicit MTS is disabled for the intra coded block, and the second HLS element indicates the NSST or the MIP is enabled for the intra coded block.

8. The method of claim 6, wherein the enabling includes:

enabling the implicit MTS for the intra coded block when the first HLS element indicates the explicit MTS is disabled for the intra coded block, and both the NSST and the MIP are disabled for the intra coded block as indicated by HLS elements.

9. The method of claim 6, further comprising:

applying the implicit MTS to the intra coded block.

10. The method of claim 6, wherein the first or second HLS element is one of:

a video parameter set (VPS) syntax element,  
a sequence parameter set (SPS) syntax element,  
a picture parameter set (PPS) syntax element,  
a slice header syntax element,  
a tile header syntax element, or  
a tile group header syntax element.

11. The method of claim 6, wherein the intra coded block is not coded with an intra sub-partitioning (ISP) mode.

12. The method of claim 6, further comprising:  
receiving a third HLS element indicating an MTS is enabled for the intra coded block.

13. A method of video decoding at a video decoder, comprising:  
receiving an intra coded block associated with a first block level syntax element indicating whether a multiple transform selection (MTS) is applied, and a second block level syntax element indicating whether a non-separable secondary transform (NSST) is applied; and  
enabling an implicit MTS for the intra coded block when the first block level syntax element indicates the MTS is not applied, and the second block level syntax element indicates the NSST is not applied.

14. The method of claim 13, further comprising:  
disabling the implicit MTS for the intra coded block when the first block level syntax element indicates the MTS is not applied, and the second block level syntax element indicates the NSST is applied.

15. The method of claim 13, wherein the intra coded block is associated with a third block level syntax element indicating whether a matrix-based intra prediction (MIP) is applied, and  
the enabling further includes enabling the implicit MTS for the intra coded block when the first block level syntax element indicates the MTS is not applied, the second block level syntax element indicates the NSST is not applied, and the third block level syntax element indicates the MIP is not applied.

16. The method of claim 15, further comprising:

disabling the implicit MTS for the intra coded block when the first block level syntax element indicates the MTS is not applied, and either the second block level syntax element indicates the NSST is applied or the third block level syntax element indicates the MIP is applied.

17. The method of claim 13, wherein the first block level syntax element indicates the MTS is not applied by indicating DCT-2 transforms are to be used for processing the intra coded block.

18. The method of claim 13, further comprising:  
applying the implicit MTS to the intra coded block.

19. The method of claim 13, wherein the intra coded block is not coded with an intra sub-partitioning (ISP) mode.

20. The method of claim 13, further comprising:  
receiving a high level syntax (HLS) element indicating an MTS is enabled for the intra coded block.