Inverse Transform Using Linearity

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<Reviewer 1>

"The manuscript is well written, well organized, and clear. The results show a higher performance of the proposed computation of inverse transforms."

We would like to thank the reviewer for the thorough review and very helpful comments. The revised manuscript was reviewed and substantially modified by a native speaker. According to the reviewer's comment, we included two new Tables, Table 3 and Table 4, so that the table indices were changed accordingly.

In answer to the specific comments:

Comment) Additions also affect complexity. Please add information on the number of additions for different transform types and sizes in original and proposed variants.

Answer) According to reviewer's comment, we added Equation (14), and Tables 3 and 4 on the number of additions for the VVC inverse transforms.

We included the following sentence and Equation (14) on page 4:

"For an (n×m) transform block which has N non-zero coefficients, the total number of additions in the proposed inverse transform using linearity is computed in Equation (14), even though Equation (14) is not used in the proposed method:

$$(N - 1) \times (n \times m) \tag{14}$$

We included the following Table 3 and 4 and sentences on page 6:

Table 3. The number of additions when the horizontal and vertical transforms are both DCT-II in the VTM-8.2.

		Width (m)						
		1	**2**	**4**	**8**	**16**	**32**	**64**
Height (n)	**1**	N/A	2	8	28	100	372	802
	2	2	8	24	72	232	808	1668
	4	8	24	64	176	528	1744	3464
	8	28	72	176	448	1248	3872	7312
	16	100	232	528	1248	3200	9152	16032
	32	372	808	1744	3872	9152	23808	37568

	64	802	1732	3720	8208	19232	49472	76992

Table 4. The number of additions when the horizontal and vertical transforms are combination of DST-VII and DCT-VIII in the VTM-8.2.

		Width (m)			
		4	**8**	**16**	**32**
Height (n)	**4**	88	344	796	3048
	8	344	1024	2264	6768
	16	796	2264	4960	13968
	32	3224	7792	16448	34464

"As a reference, Table 3 lists the number of additions computed in the VTM-8.2 source code in each (n × m) block size when the horizontal kernel and vertical transforms are both DCT-II. Table 4 presents the number of additions computed in the VTM-8.2 source code in each (n × m) block size when the horizontal and vertical transforms are a combination of DST-VII and DCT-VIII. It can be easily computed by Equation (14) that the number of additions of the proposed method is smaller for all block sizes than those in VTM-8.2."