

*Title:* Cross Check of JCTVC-F712

*Status:* Input Document to JCT-VC

*Purpose:* Cross Check

*Author(s):* David Flynn

| [davidf@rd.bbc.co.uk](mailto:davidf@rd.bbc.co.uk)

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## Abstract

This document reports an evaluation of the proposal [F712] on MC complexity reduction. The BD-rate results match those of the proposal. Run time results are presented and considered to be approximately the same as the anchor within the range of variability associated with the cluster used for the experiments. The submitted code appears to match the proposal's documentation.

## 1 Results

During the Torino meeting, a request for a cross-check was made and software provided. The proposal contains two methods with minor differences. The proposal relates only to Bi-prediction, yet results are presented for the low-delay (P) configurations to demonstrate that there are no unintentional errors.

Table 1 presents results of method A against the HM-3.0 anchors. A net gain of -0.2 and -0.4% Y' BD-Rate is achieved for low-delay random-access and low-complexity configurations respectively; no net gain is shown for any other configuration.

Table 2 presents results of method B against the HM-3.0 anchors. A net gain of -0.3 and -0.5% Y' BD-Rate is achieved for low-delay random-access and low-complexity configurations respectively; no net gain is shown for any other configuration.

Finally, table 3 presents results of method B against method A.

## 2 Software

Due to the timing of software submission, only a very brief analysis has been performed. The contributed code is a small modification, appearing to perform as described in the proposal. Some minor violations of the software guidelines are identified<sup>1</sup>.

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<sup>1</sup>indentation, variable naming, foreign language comments in national character set, commented out code

Table 1: Results of method A vs HM-3.0

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	-1.0	0.0	0.1
<b>Class B</b>	0.0	-0.1	-0.1
<b>Class C</b>	0.0	0.1	0.0
<b>Class D</b>	0.0	-0.1	-0.1
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	98%		
<b>Dec Time</b>	97%		

(a) Random Access

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	0.0	-0.1	0.1
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	-0.1	-0.1
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	98%		
<b>Dec Time</b>	102%		

(b) Random Access, LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	-0.3	-0.5	-0.7
<b>Class C</b>	-0.3	-0.6	-0.6
<b>Class D</b>	-0.1	-0.1	-0.1
<b>Class E</b>	-0.2	-0.7	-0.9
<b>All</b>	-0.2	-0.5	-0.5
<b>Enc Time</b>	99%		
<b>Dec Time</b>	94%		

(c) Low Delay(B)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	-0.6	-1.0	-1.2
<b>Class C</b>	-0.3	-0.6	-0.6
<b>Class D</b>	-0.2	-0.2	-0.3
<b>Class E</b>	-0.6	-1.1	-1.6
<b>All</b>	-0.4	-0.7	-0.9
<b>Enc Time</b>	99%		
<b>Dec Time</b>	95%		

(d) Low Delay(B), LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	97%		
<b>Dec Time</b>	97%		

(e) Low Delay(P)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	97%		
<b>Dec Time</b>	100%		

(f) Low Delay(P), LoCo

Table 2: Results of method B vs HM-3.0

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	0.0	0.1	0.0
<b>Class B</b>	0.0	-0.1	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	-0.1	-0.1
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	100%		
<b>Dec Time</b>	96%		

(a) Random Access

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	0.0	-0.1	0.2
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	-0.1	-0.1
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	100%		
<b>Dec Time</b>	98%		

(b) Random Access, LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	-0.3	-0.4	-0.4
<b>Class C</b>	-0.3	-0.6	-0.7
<b>Class D</b>	-0.2	-0.3	-0.1
<b>Class E</b>	-0.3	-0.9	-1.1
<b>All</b>	-0.3	-0.5	-0.5
<b>Enc Time</b>	100%		
<b>Dec Time</b>	94%		

(c) Low Delay(B)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	-0.7	-0.9	-1.0
<b>Class C</b>	-0.4	-0.6	-0.8
<b>Class D</b>	-0.2	-0.7	0.0
<b>Class E</b>	-0.7	-1.8	-1.5
<b>All</b>	-0.5	-0.9	-0.8
<b>Enc Time</b>	100%		
<b>Dec Time</b>	93%		

(d) Low Delay(B), LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	98%		
<b>Dec Time</b>	97%		

(e) Low Delay(P)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	98%		
<b>Dec Time</b>	99%		

(f) Low Delay(P), LoCo

Table 3: Results of method B vs method A

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	0.0	0.1	-0.1
<b>Class B</b>	0.0	0.0	0.1
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	102%		
<b>Dec Time</b>	99%		

(a) Random Access

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>	0.0	0.0	0.0
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>			
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	102%		
<b>Dec Time</b>	97%		

(b) Random Access, LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.1	0.3
<b>Class C</b>	0.0	0.0	-0.1
<b>Class D</b>	0.0	-0.1	0.1
<b>Class E</b>	0.0	-0.3	-0.2
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	101%		
<b>Dec Time</b>	100%		

(c) Low Delay(B)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.1	0.2
<b>Class C</b>	0.0	0.0	-0.2
<b>Class D</b>	0.0	-0.5	0.2
<b>Class E</b>	-0.1	-0.7	0.1
<b>All</b>	0.0	-0.2	0.1
<b>Enc Time</b>	101%		
<b>Dec Time</b>	98%		

(d) Low Delay(B), LoCo

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	101%		
<b>Dec Time</b>	100%		

(e) Low Delay(P)

	Y' BD-rate	U BD-rate	V BD-rate
<b>Class A</b>			
<b>Class B</b>	0.0	0.0	0.0
<b>Class C</b>	0.0	0.0	0.0
<b>Class D</b>	0.0	0.0	0.0
<b>Class E</b>	0.0	0.0	0.0
<b>All</b>	0.0	0.0	0.0
<b>Enc Time</b>	101%		
<b>Dec Time</b>	99%		

(f) Low Delay(P), LoCo