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Study Group 15
Experts Group for ATM Video Coding
(Rapporteur's Group on Part of Q.2/15)

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Source: Japan
Title: Quantization of Intra-compatible MBs
Purpose: Information
Relevant Sub group: Video

1. Introduction

In the current TM description, quantization for Intra-compatible MBs is defined to be the same quantization for Inter MBs. It was reported at the Torino/Roma meeting that quantization for Intra MBs were applied to Intra-compatible MBs instead of quantization for Inter MBs and up to 1 dB gain for the I picture was obtained (MPEG93/015). This document the reports on the result of carrying out the same experiment for both an interlace-interlace case and an interlace-progressive case. Comparison of both quantization in picture quality will also be demonstrated.

2. Simulation condition

The simulation condition was as follows.

TM2 based M=3, N=15 Fr structure, Fr/Fi prediction
Bitrate base layer : 1.15 Mbps Total bit rate : 4 Mbps
Spatio-temporal weighting; not used
Up/down sampling; 3 field aperture filter (for interlace-interlace case)
Sequences; Football (new), Flower Garden (2 seconds)
Motion vector search range
Base layer ±7.5 pels/fr (FG), ±15 pels/fr (FB)
Upper layer ±15 pels/fr (FG), ±30 pels/fr (FB)

3. Simulation result

Table 1 shows the result for the interlace-progressive case and Table 2 shows the result for the interlace-interlace case. The table shows the SNR and the percentage of compatible mode selection in the form of;

SNR for a whole sequence (SNR for I pictures; SNR for P pictures; SNR for B pictures) and
the percentage of compatible mode selection for I pictures; the same for P pictures; the same for B pictures.

The results show that a 0.6-0.87 dB gain was obtained for the I picture by changing the quantization for Intra-compatible MBs from Inter quantization to Intra quantization. However, the gain for the total SNR was small, because the SNRs for the P and B pictures were nearly the same as before changing. The difference in picture quality was also small. As far as these results are concerned, it seems that quantization for Intra-compatible MBs may be kept as it is now.

4. Conclusion

Some SNR gain was obtained for the I picture by changing the quantization for Intra-compatible MBs, but the difference in the total SNR and picture quality was not so large as to necessitate such change in quantization.

END

Table 1 Quantization of Intra-compatible MBs
(Interlace-Progressive)

Football

	SNR (I; P; B)	Compatible mode (%)
Inter quantization	35.46 (36.00; 35.99; 35.21)	100; 76.2; 40.3
Intra quantization	35.46 (36.60; 35.99; 35.16)	100; 74.6; 39.2

Flower Garden

	SNR (I; P; B)	Compatible mode (%)
Inter quantization	28.96 (28.89; 28.89; 28.99)	99.8; 51.2; 14.5
Intra quantization	29.02 (29.66; 28.90; 29.01)	99.8; 49.2; 13.5

Table 2 Quantization of Intra-compatible MBs
(Interlace-Interlace)

Football

	SNR (I; P; B)	Compatible mode (%)
Inter quantization	34.98 (35.36; 35.41; 34.78)	100; 66.6; 28.3
Intra quantization	35.04 (36.03; 35.76; 34.70)	100; 65.5; 26.6

Flower Garden

	SNR (I; P; B)	Compatible mode (%)
Inter quantization	28.40 (28.44; 28.28; 28.45)	99.9; 20.8; 7.7
Intra quantization	28.48 (29.31; 28.27; 28.49)	99.9; 18.9; 6.3