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CODING OF MOVING PICTURES AND ASSOCIATED
AUDIO

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Title: Simulation Results
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1 Simulation Conditions

We have evaluated the prediction modes on the frame based frame structure TM1, whose testing conditions are as following.

- 1 Frame Based Frame Structure
- 2 Bit Rate: 4Mbps
- 3 M: 3
- 4 N: 15
- 5 Motion Vector: $(\pm 15.5, \pm 15.5)$ /frame
- 6 Sequences: Mobile & Calendar, Flower Garden, Bicycle

2 Results

2.1 Results of Predictions

The luminance SNR results of our simulations are shown in Table 1.

Table 1: The Comparison of Predictions by SNR for Luminance

Sequences	Frame	F/f	F/f/Du	FAMC	FAMC w/o Intrap	F/f/FAMC/Du
Mobile & Calendar	27.99	28.34	28.43	28.54	28.16	28.63
Flower Garden	28.72	29.64	29.78	30.32	29.76	30.39
Bicycle	27.39	27.64	27.62	28.04	27.88	27.91

According to the Table 1, we are able to evaluate the accuracy of predictions for the three sequences, that are to be arranged in the order of low to high prediction effectiveness as following.

$$\text{Frame} < \text{Frame/field} \leq \text{F/f/dual} < \text{FAMC only} \leq \text{F/f/dual/FAMC}$$

As the results of “FAMC only” is better than “F/f/dual”, we are able to expect FAMC introducing simplicity to TM.

Considering the reduction of memory band width at the decoder, interpolation of FAMC on B-picture will be inhibited. However, our simulation shows that FAMC without interpolation of B-picture causes significant degradation of image quality.

2.2 Modified FAMC

We have modified FAMC to become simple one. $(a+b)$ is constrained to powers of 2 with accuracy of N-bits. Table 2 shows our simulation results of modified FAMC as described above.

The influence of reducing bit length can be ignored if the number is greater or equal 2 or 3.

Table 2: The Influence of the Number of Bits of the FAMC Calculation

# of bits	Mobile & Calendar			Flower Garden			Bicycle		
	Y	Cb	Cr	Y	Cb	Cr	Y	Cb	Cr
16 bit	28.65	34.41	34.47	30.56	33.67	35.21	28.56	34.55	35.49
5 bit	28.65	34.41	34.47	30.56	33.67	35.21	28.57	34.55	35.49
4 bit	28.65	34.40	34.47	30.57	33.67	35.20	28.56	34.54	35.48
3 bit	28.63	34.40	34.46	30.53	33.64	35.18	28.56	34.54	35.48
2 bit	28.61	34.39	34.44	30.41	33.59	35.14	28.53	34.51	35.45
1 bit	28.59	34.38	34.44	30.45	33.60	35.14	28.40	34.44	35.37

3 Conclusion

As the results of our simulation results described above, we are to conclude as followings.

1. FAMC provides high prediction efficiency.
2. FAMC without interpolation of B-picture causes significant degradation of image quality.
3. FAMC can be simplified, such as bit accuracy of $(a+b)$ to 2 or 3 bits.