CCITT SGXV
Working Party XV/I
Experts Group for ATM Video Coding

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SOURCE : NEC
TITLE : A study on the effect of B frame
PURPOSE : Information

1 Introduction

The MPEG SM3 has employed the IBP structure. However, B frames require a large amount of memory and delay. This paper reports a study on the effect of employing the B frames.

2 Simulation

Simulation conditions are shown below.

- based on SM3
- frame based coding by field merge conversion
- input signal format is 4:2:0 (color signals of the second field are omitted)
- M = 3, N = 12
- three cases of bit assignment : IBP, IP1, IP2 (see Table 1)

Table 1: Bit assignment

	NI : NP : NB
IBP	10 : 5 : 1
IP1	5 : 1 : 0
IP2	2 : 1 : 0

- no bit assignment modify every GOP
- Initial Qp = 8
- Buffer = 400kbits (4Mbps), 900kbits (9Mbps)
- "Mobile and Calendar", "Table Tennis" 60 frames each

Figure 1 shows the simulation results. The best SNR is achieved in the IBP case. However, the SNR difference between IBP frames is relatively large and it may cause an annoying flicker effect. In the IP1 case, the SNR decreases gradually within GOP. In the IP2 case, the SNR becomes almost constant.

3 Conclusion

The IBP structure gives the best SNR result. Without B frames, the amount of fluctuation in SNR can be controlled by IP bit assignment, but the SNR value obtained is almost lower than that of the IBP case.

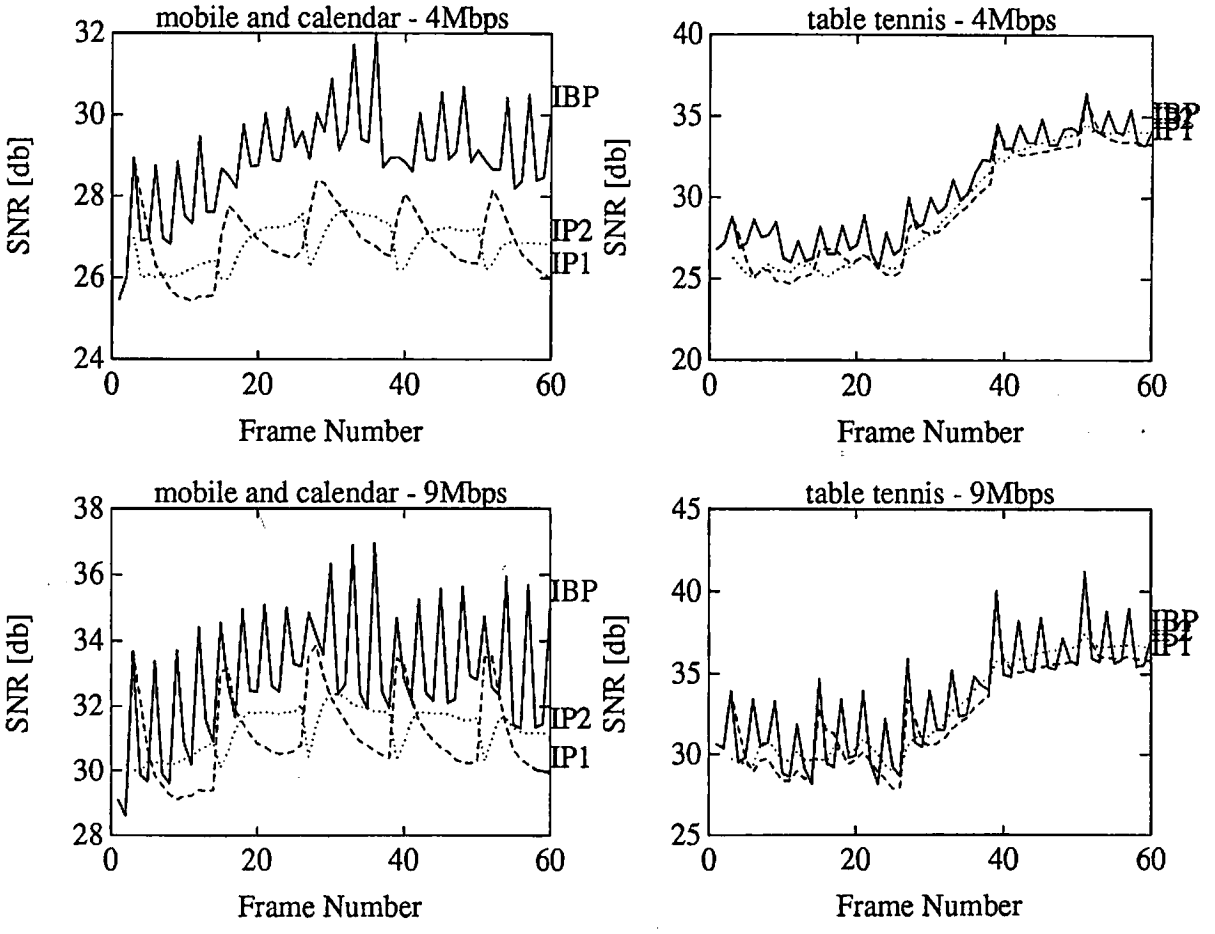

Figure 1: SNR of Y signal