LDPC (Low-density parity-check) code and Turbo code show good performance in many communication systems. Recently they are applied in storage systems for improving the bit error rate (BER) performance [1]. Serial concatenated convolutional code (SCCC) using recursive systematic convolutional (RSC) code has simpler scheme than iterative coding schemes like LDPC or Turbo codes [2]. We know that the LDPC code has better BER performance than RSC code but LDPC code has a very higher hardware complexity than RSC code. We investigate the performance of these systems after four channel iterations. In Fig.1, we notice that the SCCC has better performance than the LDPC system until 27dB (< 10^-6 BER). On the other hand (> 10^-6 BER), the LDPC code has better performance than the SCCC. We see the error floor of SCCC after 10^-6 BER. The SCCC and LDPC perform 3.5dB better than the NPM at 10^-6 BER. In LDPC, the maximum number of inner iterations and channel iterations are 10 and 4, respectively. In SCCC, the number of channel iterations is 4, too. The normalized user bit density (UBD) is 1.7. The code rate is 0.944(4096/4336). We use the PR target of PR(12321). The percentage of the jitter noise is 10% and AWGN is 20%.

We can expect that the performance is improved if we increase the number of iterations in both systems. Therefore we simulate the performance when inner iterations of LDPC decoder and channel iterations are increased.

We conclude that the SCCC is better coding scheme than LDPC because the RSC encoder/decoder is simple. Also the error floor may not cause any problem since the system has to use the outer code (in general, RS code is used for the outer code) for error free system.

REFERENCES