

In this paper, a parallel concatenated structure is proposed to improve the performance of polar codes in finite length in which multiblocks systematic polar codes (SPC) and recursive systematic convolutional codes (RSC) are combined. We first design a weighted iterative decoding algorithm for the proposed structure such that better bit error rate performance can be obtained. Then, a deliberated interleaver is optimized for the new scheme. Thereafter, we introduce a strategy to estimate the minimum distance of the concatenation codeword, where an asymptotic performance and convergence behavior analysis are elaborated. Finally, the error performance of the proposed scheme is evaluated via simulations. The results show that our scheme almost outperforms all the existed concatenation ones using polar codes, making the codes more practical.