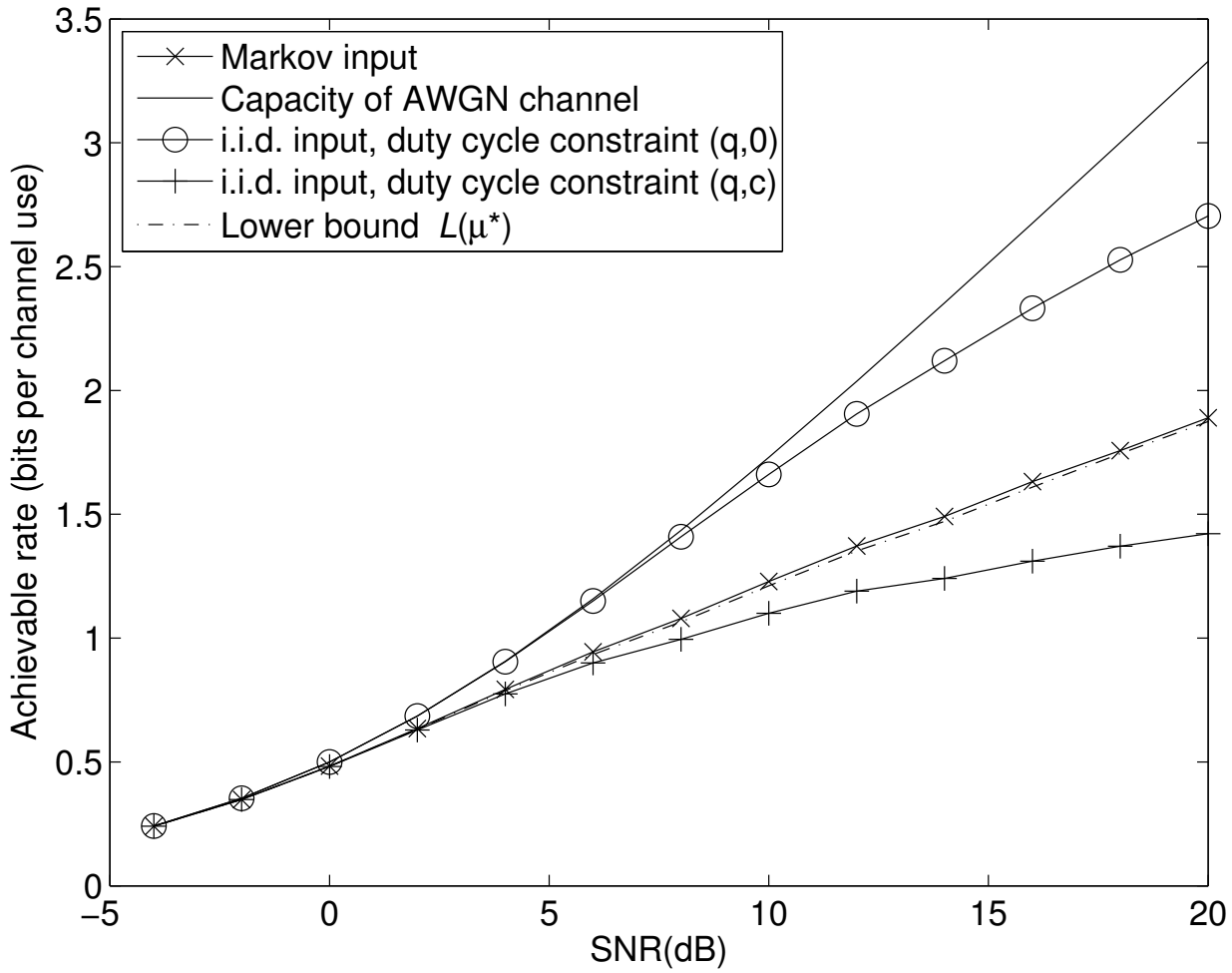

Fig. 4. The achievable rate vs. the SNR. Duty cycle ≤ 0.5, transition cost $c = 1.0$.

VII. Concluding Remarks

In this paper we have studied the impact of duty cycle constraint on the capacity of AWGN channels. Under the idealize duty cycle constraint, the optimal distribution has an infinite number of probability mass points in a bounded interval. This allows efficient numerical optimization of the input distribution. Under the realistic duty cycle constraint, the capacity-achieving input is hard to compute. We develop techniques for computing a near-optimal input distribution. This input takes the form of a discrete first-order Markov process, which matches the "Markov" nature of the duty cycle constraint. The numerical results show that under the duty cycle constraint, departing from the usual paradigm of intermittent packet transmissions may yield substantial gain.