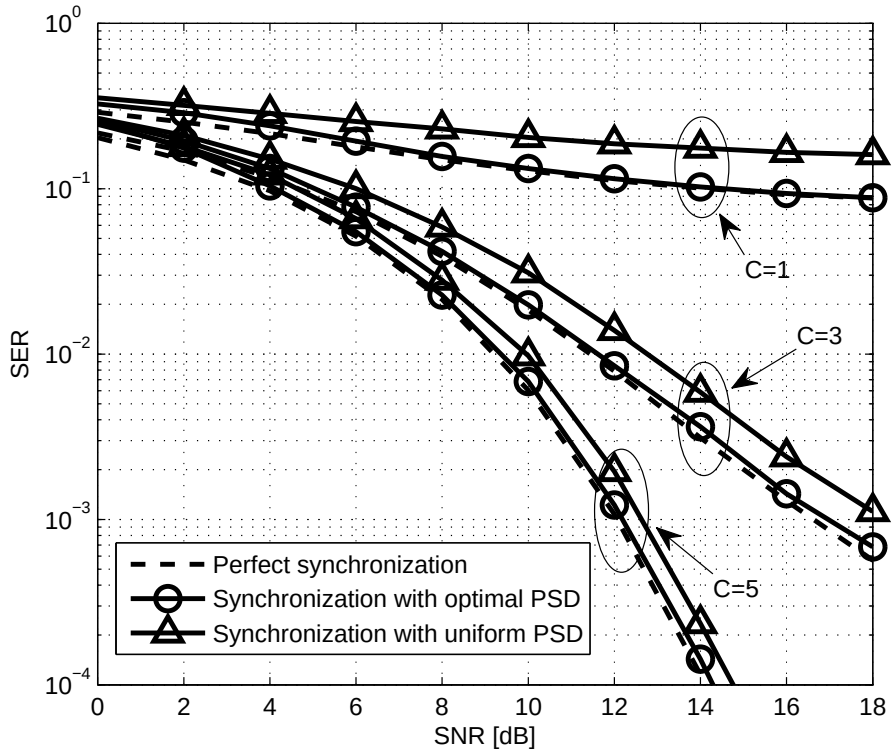

Fig. 4. SER with uncoded BPSK transmission versus SNR with joint phase and timing estimation (31), $F = 2$, $A = 0.7$, $N = 100$ and $N_p = 16$.

that the proposed scheme significantly outperforms the conventional white-PSD strategy, and that the gain of the proposed scheme is more pronounced for larger SNR values. This is because as the SNR grows, the impact of the quantization noise becomes more relevant compared to the channel noise. Furthermore, a larger oversampling factor F is seem to yield an improved performance only for the proposed optimization scheme and not with the conventional white-PSD scheme. This is because in the latter case, the performance benefits of a larger number of observation are offset by the increased fronthaul overhead, which leads to a more pronounced quantization noise.

Adopting the same estimator for time and phase offset, the system performance in terms of uncoded SER during the data phase is shown in Fig. 4 and Fig. 5 for BPSK and QPSK modulation, respectively, versus the SNR for both training and data fields, i.e., SNR $=$ SNR$_p =$ SNR$_d$, with $F = 2$, $A = 0.7$, $N = 100$ and $N_p = 16$. Simulation results with perfect synchronization are