Lab. 2
Channel Coding

Ignacio Condés Menchén
Luis Alberto Pacheco Lorenzo
Advanced Techniques in Signal Processing and Communications

March 6, 2019

Convolutional Encoding

The function `encoding` enters the sequence into the coding scheme given by the coding matrix `G`. It works for any generic matrix, but the implementation has been tested with $\mathbf{G}(D) = [D^2+1,\ D^2+D+1]$ (as it is stated in the practice).

Later, it is passed through a BSC (*Binary Symmetric Channel*), with a given error probability affecting each bit on an independent way.

Hence, we can compare the *Bit Error Rate* vs. the *Signal-to-Noise Ratio*, as seen on Figure 1.

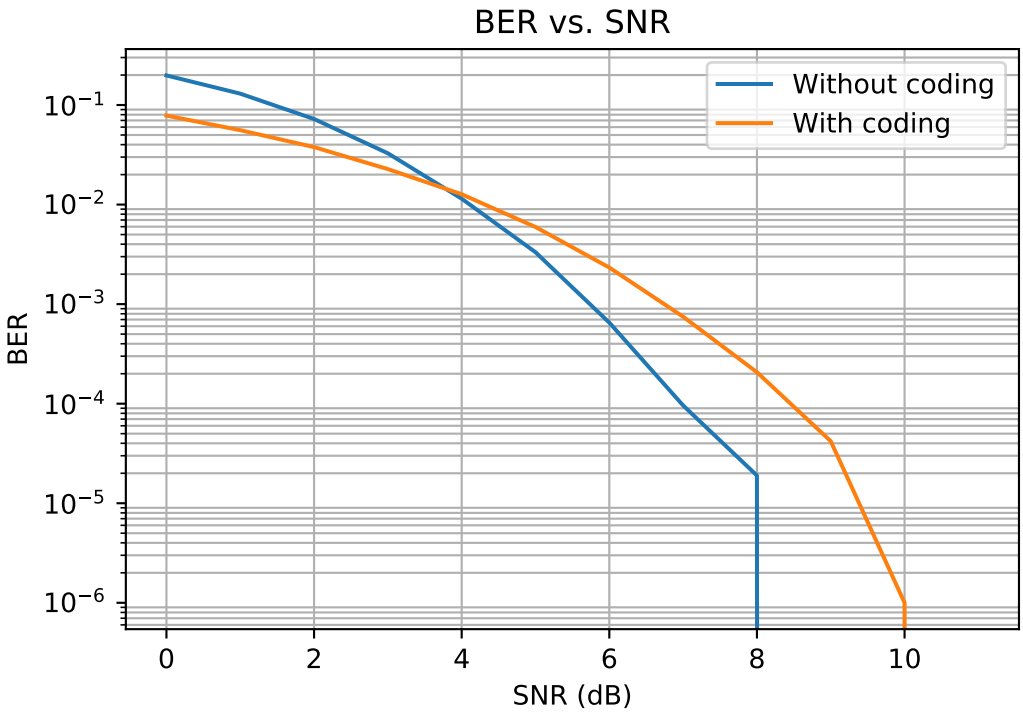

Figure 1: BER vs SNR

It can be seen that, on a higher SNR, a convolutional encoding is less worthy, as the bit error probability is too low for that. Hence, we can find an intersection point where both error probabilities are similar (approximately on a SNR value of 4 dB for this coding matrix $\mathbf{G}$). Beyond that point, we can consider that the channel is good enough for a raw transmission without a protection redundancy.