SNR

定義: $\frac{\mathrm{E}_b}{N_0} = \frac{P}{2R\sigma^2}$

E_b:每位元能量

R: 編碼率 $(\frac{k}{n})$

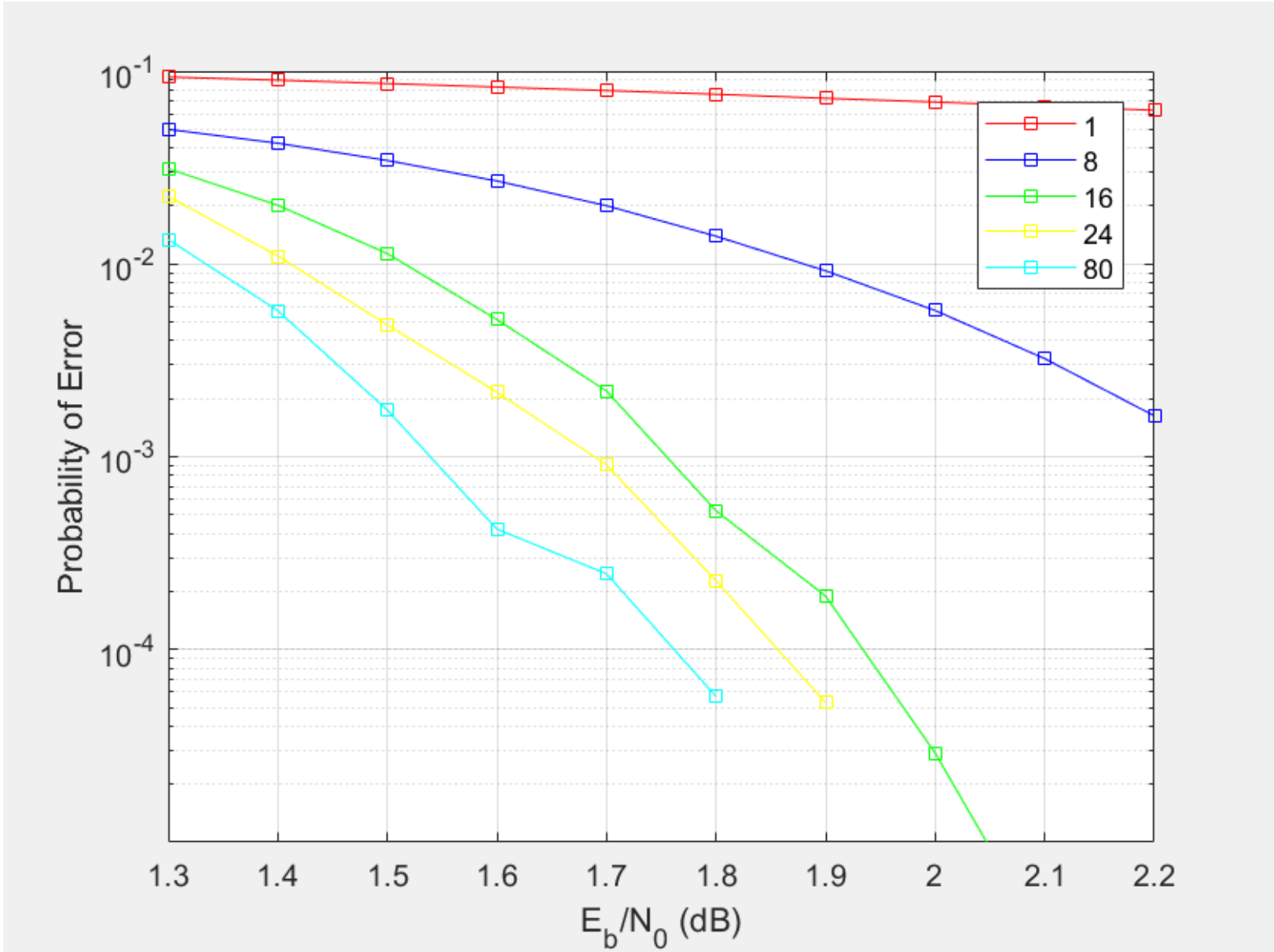
σ^2:雜訊變異數

假設功率P = 1，雜訊比以dB為單位

$$SNR = 10\log_{10}\left(\frac{E_b}{N_0}\right)\text{dB} \quad \Rightarrow \quad \frac{SNR}{10} = \log_{10}\left(\frac{E_b}{N_0}\right)$$

$$\Rightarrow \quad 10^{\frac{SNR}{10}} = \frac{E_b}{N_0} \qquad \Rightarrow \frac{P}{2R\sigma^2} = 10^{\frac{SNR}{10}}$$

$$\Rightarrow \quad \frac{P}{2R\sigma^2} = 10^{\frac{SNR}{10}} \qquad \Rightarrow \qquad \sigma^2 = \frac{1}{2}\cdot\frac{n}{k}10^{-\frac{SNR}{10}}$$


Probability of Error
10^{-1}
10^{-2}
10^{-3}
10^{-4}
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
2.1
2.2
E_b/N_0 (dB)
1
8
16
24
80