# Bit-error probability

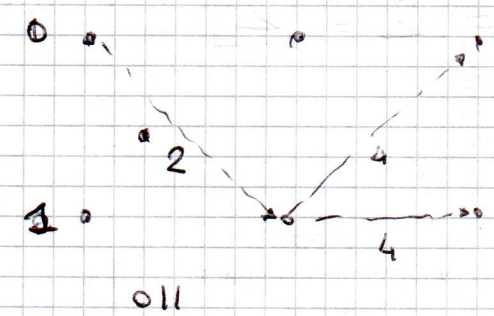
EX3. 2016-07-04

$$p_b(E) \leq \sum_{d_h} w(d_h) \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot R \cdot d_h}\right)$$

3.2

## 2-STEP

... rep. of zeros

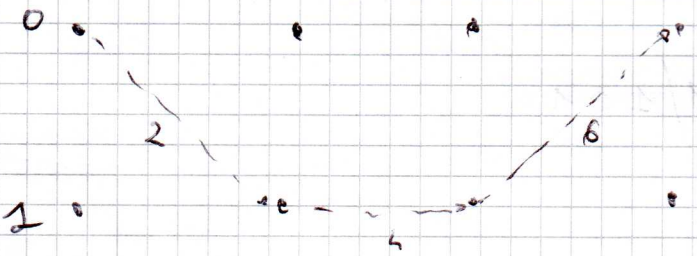



011

2-step $d_h = \boxed{4}$

1-bit error

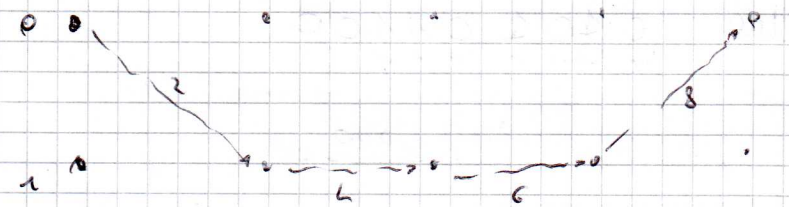
## 3-STEP




$d_h = 6$

2-bit error

## 4-STEP




$d_h = 8$

3-bit error

$$p_b(E) \leq 1 \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot \frac{1}{3} \cdot 4}\right) + 2 \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot \frac{1}{3} \cdot 6}\right) + 3 \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot \frac{1}{3} \cdot 8}\right)$$

$$= \sum_{h=1}^{3} h \cdot Q\left(\sqrt{\frac{2E_b}{N_0} \cdot R \cdot 2(h+1)}\right)$$