TMA : 10/7/2003

$\boxed{1}$

(2)

$\boxed{1}$

1) $d^H_{min} = 4 \rightarrow t = 1$, rileva fino a 3 errori

2) $P_w(E) \leq \sum_{i=t+1}^{n} \binom{n}{i} p^i (1-p)^{n-i} = 1 - \sum_{i=0}^{t} \binom{n}{i} p^i (1-p)^{n-i}$

$$\begin{cases} P_w(E) \simeq \binom{n}{t+1} p^{t+1} (1-p)^{n-t-1} \\ P_b(E) \simeq \dfrac{2t+1}{n} P_w(E) \end{cases}$$

HARD DECISION

$p = Q\left(\sqrt{\dfrac{2E_b}{N_0}\dfrac{K}{N}}\right) \rightarrow P_w(E) \simeq Q\left(\sqrt{\dfrac{2E_b}{N_0}\dfrac{K}{N}\underbrace{(t+1)}_{2}}\right)$

SOFT decisione $\rightarrow d^2_{min} = 4 E_s d^H_{min}$; $E_s = E_b \dfrac{K}{N}$

$d^2_{ij} = \sum_{k=1}^{N} (a_{ik} - a_{jk})^2 E_s$

$P_w(E) \leq 15\, Q\left(\sqrt{\dfrac{2E_b}{N_0}\left(\dfrac{K}{N}\right) d^H_{min}}\right)$ 3

$P_w(E) \leq 7\, Q\left(\sqrt{\dfrac{2E_b}{N_0}\dfrac{K}{N}\cdot 3}\right) + 7\, Q\left(\sqrt{\dfrac{2E_b}{N_0}\dfrac{K}{N}\cdot 4}\right) + 1\cdot Q\left(\sqrt{\dfrac{2E_b}{N_0}\dfrac{K}{N}7}\right)$

$P_b(E) \simeq \dfrac{2t+1}{N} P_w(E)$