exo type

BCH binaire $(n=15, k=7)$ $t=2$

$\begin{cases} \text{Corps de base: } GF(2) \\ \text{Corp étendu : } GF(16) \quad \alpha^{15}=1 \end{cases}$

Code binaire

coeff sur $GF(2)$!

$V = 010000000000000 \implies V(x) = X^{13}$

$\uparrow_{14} \quad \uparrow_{13}$
$x^{14} \quad x^{13}$

1) $S_1 = V(\alpha) = \alpha^{13}$ $S_3 = V(\alpha^3) = \alpha^{39} = \alpha^9$

$S_2 = V(\alpha^2) = \alpha^{26} = \alpha^{11}$ $S_4 = V(\alpha^4) = \alpha^{52} = \alpha^7$

2) Hyp : $\nu = 2$ (t)

$M = \begin{bmatrix} S_1 & S_2 \\ S_2 & S_3 \end{bmatrix} = \begin{bmatrix} \alpha^{13} & \alpha^{11} \\ \alpha^{11} & \alpha^9 \end{bmatrix} = \alpha^{22} - \alpha^{22} = 0$

$\implies \nu = 2$ rejeté

Hyp : $\nu = 1$

$M = [S_1] = \alpha^{13} \neq 0$ $\boxed{\nu = 1}$

3) $\ell(x) = Y_1 X^{i_1}$ avec $Y_i = 1$ code binaire

$= X^{i_1}$

$\Lambda(x) = \Lambda_1 X + 1 = 1 - x X_1$ avec $X_1 = \alpha^{i_1}$

$\Lambda_1 S_1 = S_2 \implies \Lambda_1 \alpha^{13} = \alpha^{26} \implies \Lambda_1 = \alpha^{13}$

$\Lambda(x) = \alpha^{13} X + 1 \implies$ racine $= 1/\alpha^{13} \implies \frac{1}{X_1} = \frac{1}{\alpha^{13}}$

$\implies X_1 = \alpha^{13} = \alpha^{i_1} \implies i_1 = 13$

$\hat{e}(x) = X^{13}$

4) $V(x) = \hat{C}(x) + \hat{e}(x) \implies \hat{C}(x) = V(x) + \hat{e}(x) = 0$

$\hat{C} = \underbrace{00 \cdots 00}_{15 \text{ zeros}} \implies \hat{u} = 0000000$ (7 bit systématique à gauche)