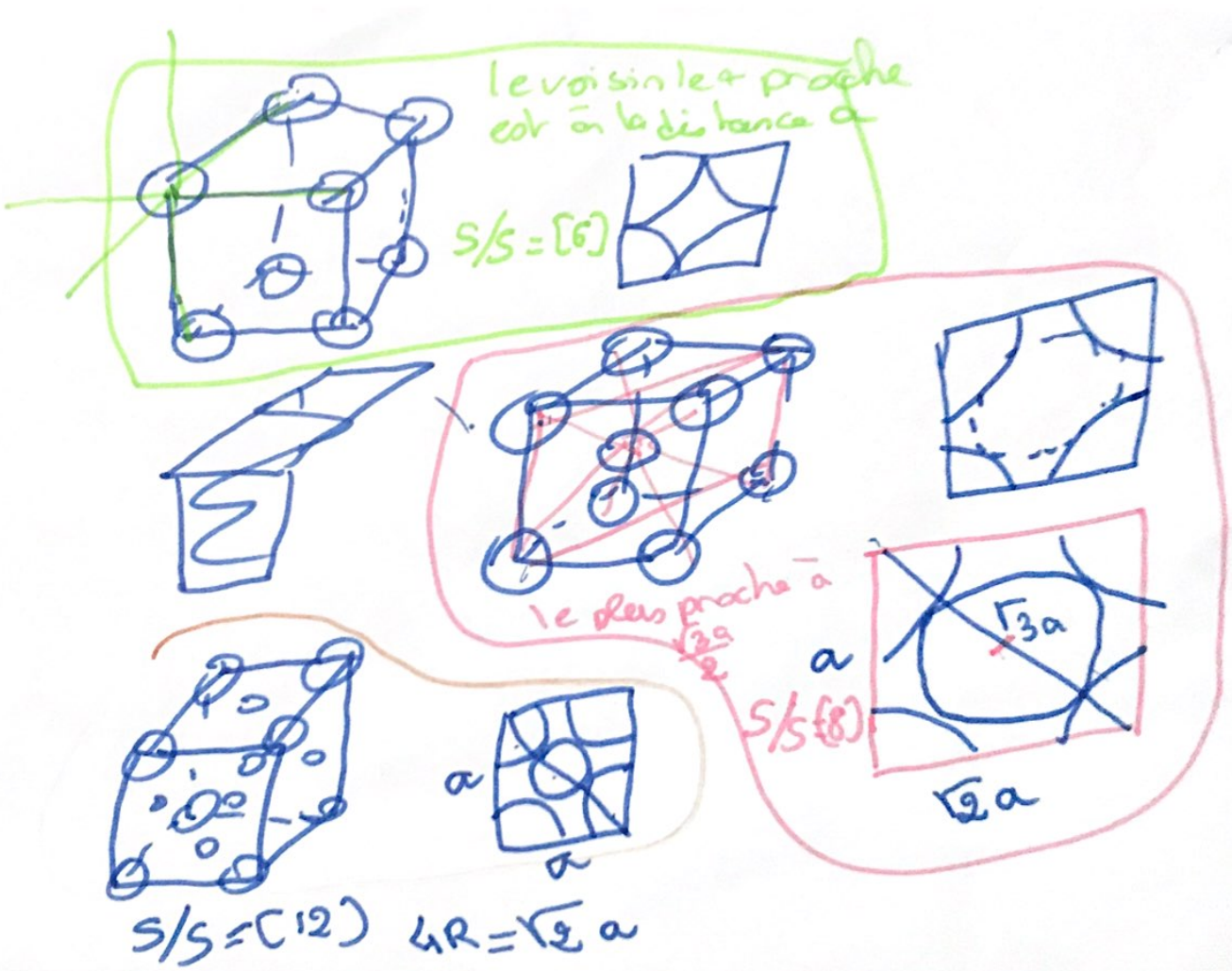
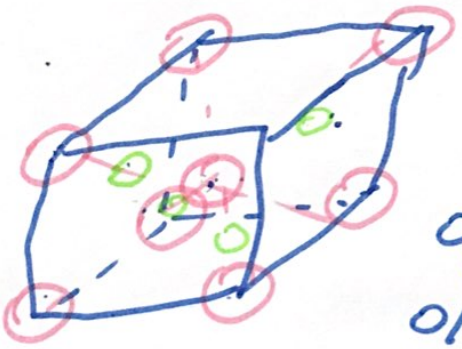

le voisin le + proche est à la distance a
S/S = [6]
le plus proche à
$\frac{\sqrt{3}a}{2}$
a
S/S [8]
$\sqrt{3}a$
$\sqrt{2}a$
a
a
S/S = [12]
4R = $\sqrt{2}$ a

ooo colle Cu_2O

O^{2-} C.C • $\underbrace{8 \times 1/8}_{\text{sommets}} + \underbrace{1 \times 1}_{\text{int}} = 2$

Cu^+ milieu des 4 des 8/2 diagonal. $\underbrace{4 \times 1}_{\text{int}} = 4$



Cu_2O 2 unités formulaire/maille

$O/\underline{O} = [8]$

$O/Cu = [4]$

$Cu/O = [2]$

$Cu/Cu = [12]$ ⭐

Couplage parfait

$$\Phi_1 = L_1 i_1 + M i_2$$
$$\Phi_2 = L_2 i_2 + M i_1$$

si $i_2 = 0$ $\quad \Phi_1 = L_1 i_1 \quad \Phi_2 = M i_1 \Rightarrow \frac{\Phi_2}{\Phi_1} = \frac{M}{L_1}$

si $i_1 = 0$ $\quad \Phi_1 = M i_2 \quad \Phi_2 = L_2 i_2 \Rightarrow \frac{\Phi_2}{\Phi_1} = \frac{L_2}{M}$

on a un couplage parfait on a le rapport $\frac{\Phi_2}{\Phi_1}$

$M = \sqrt{L_1 L_2}$

on a aussi $L_1 = k N_1^2 \qquad k = \mu_0 \frac{S}{L} \mu_r$

$L_2 = k N_2^2$

$M = k N_1 N_2$

En regime sinusoidal

$$\begin{cases} u_1 = L_1 \frac{di_1}{dt} + M \frac{di_2}{dt} \\ u_2 = L_2 \frac{di_2}{dt} + M \frac{di_1}{dt} \end{cases}$$

en notation complexe

$$\begin{cases} \underline{U_1} = jL_1\omega \underline{I_1} + jM\omega \underline{I_2} \\ \underline{U_2} = jL_2\omega \underline{I_2} + jM\omega \underline{I_1} \end{cases}$$

$$\begin{cases} \underline{U_1} = j\omega \left[kN_1^2 \underline{I_1} + kN_1N_2 \underline{I_2} \right] \\ \underline{U_2} = j\omega \left[kN_2^2 \underline{I_2} + kN_1N_2 \underline{I_1} \right] \end{cases}$$

$$\begin{cases} \underline{U_1} = j\omega k N_1 \left(N_1 \underline{I_1} + N_2 \underline{I_2} \right) \\ \underline{U_2} = j\omega k N_2 \left(N_2 \underline{I_2} + N_1 \underline{I_1} \right) \end{cases}$$

$$\frac{\underline{U_2}}{\underline{U_1}} = \frac{N_2}{N_1}.$$

$U = Ri$