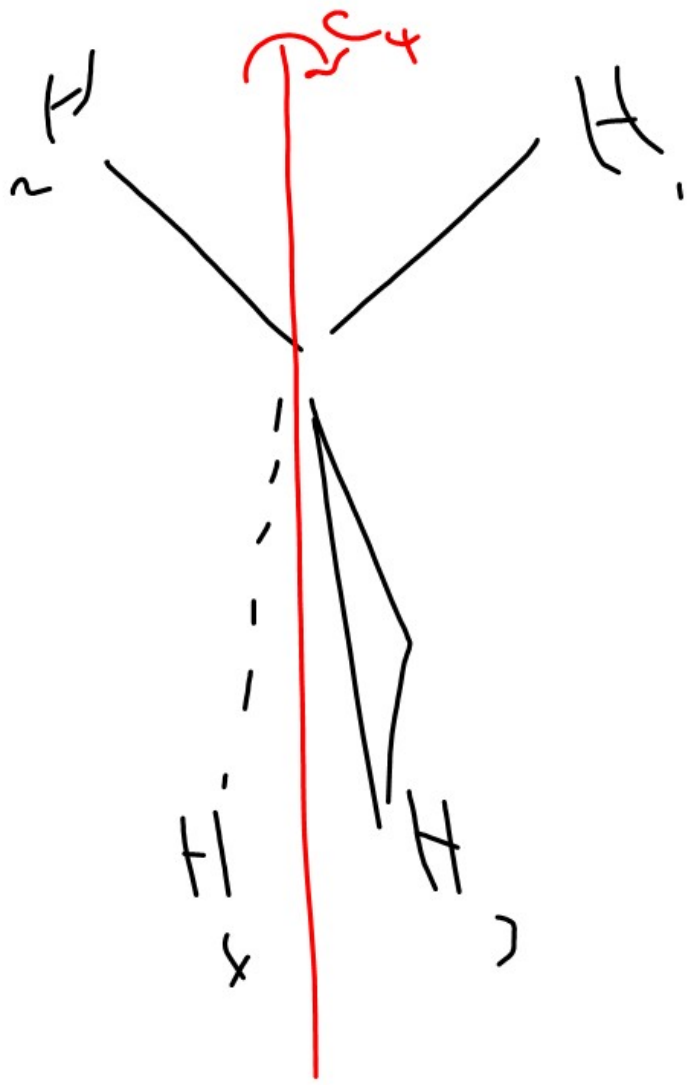
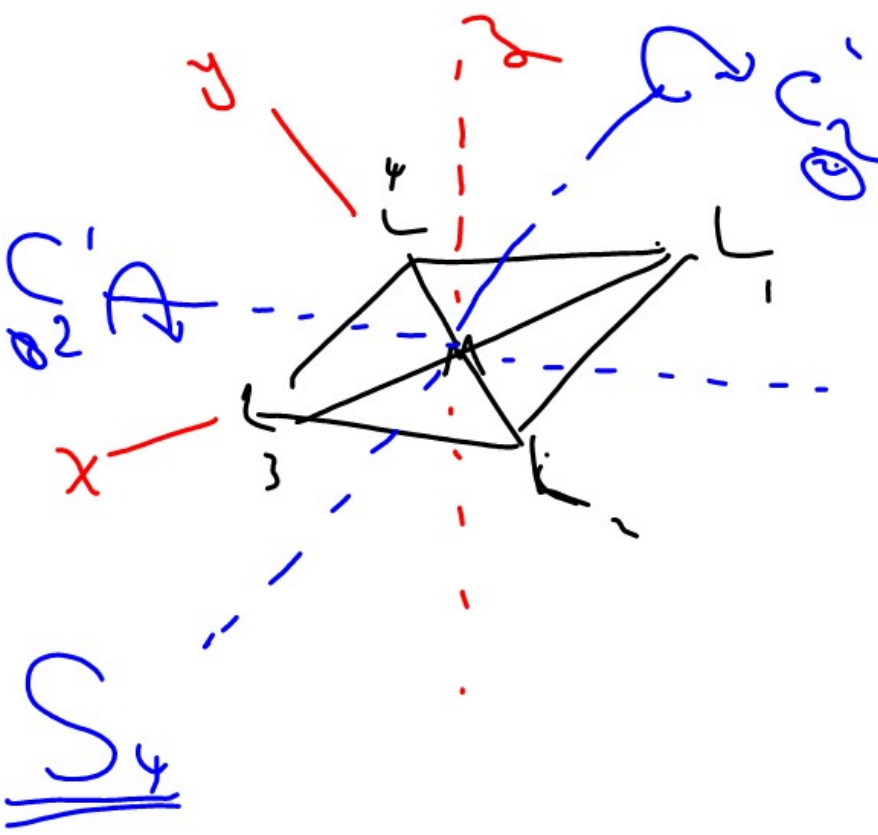
Improper Rot. S_n

C_n & σ_I with:

① not existing separately
② or giving new effect



$\sigma_I \times C_4 \equiv S_4$



C_4^1, C_4^2, C_4^3, $C_4^4 = E$

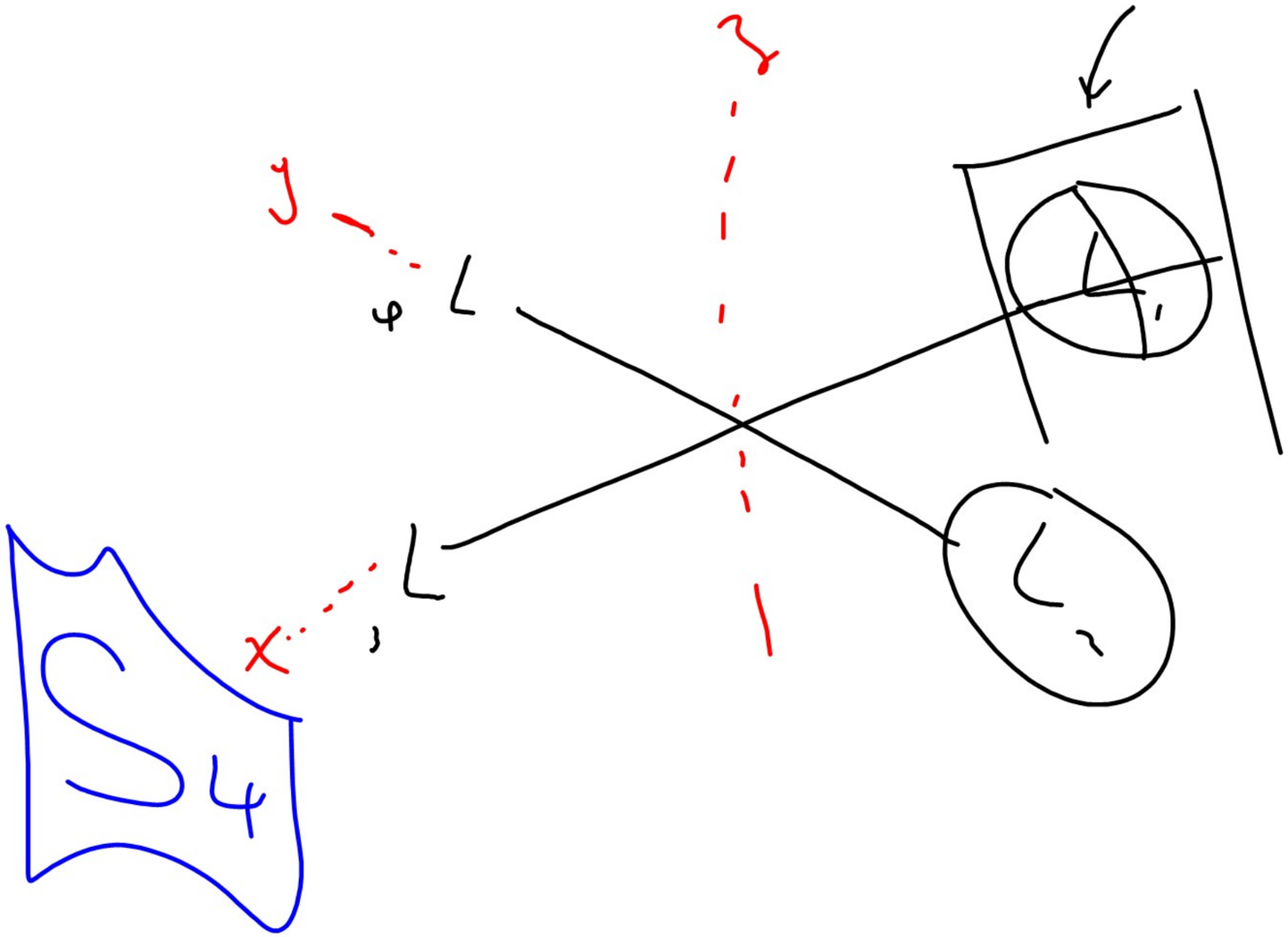
$C_{2(z)}$

$C_{2(x)}$, $C_{2(y)}$

σ_{xy}, σ_{xz}, σ_{yz}

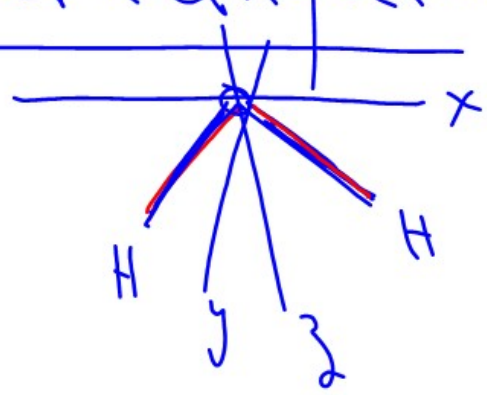
σ, σ

i, E



Symm. Point Group:

System, having a set of symm. operation with certain features:



① Closure:

$E, C_2, \sigma_{xz}, \sigma_{yz}$

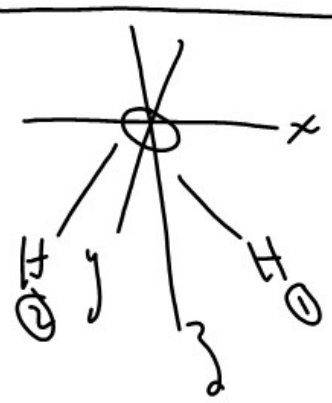
	E	C_2	σ_{xz}	σ_{yz}
E	E	C_2	σ_{xz}	σ_{yz}
C_2	C_2	E	σ_{yz}	σ_{xz}
σ_{xz}	σ_x	σ_{yz}	E	C_2
σ_{yz}	σ_{yz}	σ_{xz}	C_2	E

① every operation must have an inverse:

$B \times A = E$ — Special case for H_2O — every operation is inverse to itself

$C_3' \times C_3'$ $C_3^2 \times C_3' = E$

③ must have E



$E, C_2', C_2^2 = E, \sigma_{xz}, \sigma_{yz}$

C_{2v}

① V. ~~Low~~ Symm. Operations

① No symm. ⟹ E ⟹ C_1

② V. Low Symm

E + i only	C_i
E + σ only	C_s
E + C_2 only	C_2