

Both of spectral sequences about to the hyperhomology
 $H_*(E.(M) \otimes F.(N), \partial_M \otimes 1 \pm 1 \otimes \partial_N)$.

Since tensoring with a free module preserves exact sequences, $'E_{p,q}^{p,q} = 0$ for $q > 0$ and $''E_{p,q}^{p,q} = 0$ for $p > 0$.

$$\mathbb{F} \quad 'E_{p,q}' = H_q(E_p \otimes F.(N), 1 \otimes \partial_N)$$

$$F_{q+1} \longrightarrow F_q \longrightarrow F_{q-1} \longrightarrow$$

$$\Rightarrow E_p \otimes F_{q+1} \longrightarrow E_p \otimes F_q \longrightarrow E_p \otimes F_{q-1} \dots (*)$$

If $p \geq 0$, E_p free module. $\Rightarrow (*)$ exact sequence

$$\Rightarrow 'E_{p,q}' = 0 \quad q \geq 1$$

$$\text{Similarly, } ''E_{p,q}'' = H_q(E.(M) \otimes F_p, \partial_M \otimes 1)$$

If $p \geq 0$, F_p free \Rightarrow

$$E_{q+1} \otimes F_p \longrightarrow E_q \otimes F_p \longrightarrow E_{q-1} \otimes F_p \quad \text{exact}$$

\Rightarrow

$$'E_{p,q}' = 0$$

$$H_n(E.(M) \otimes F.(N), \partial_M \otimes 1 \pm 1 \otimes \partial_N) = 0 \quad \text{if } n \leq -2.$$

$$'F_p K_n = 0 \quad \text{if } p \leq -2 \quad 'F_{n+2} K_n = K_n = ''F_{n+2} K_n$$

$$''F_p K_n = 0 \quad \text{if } p \leq -2 \Rightarrow 'F_p H_n = ''F_p H_n = 0 \quad \text{if } p \leq -2.$$

\Rightarrow By Th. 11.13. on p 318. Rotman,

$$'E_{p,q}^\infty \cong 'F_p H_{p+q} / 'F_{p+1} H_{p+q} \quad \text{and} \quad ''E_{p,q}^\infty \cong ''F_p H_{p+q} / ''F_{p+1} H_{p+q}.$$

$$\text{Since } 'F_{p+q+1} K_{p+q} \quad 'F_{p+q+2} K_{p+q+1}$$

$$K_{p+q} \quad K_{p+q+1}$$