

We may therefore think of $H^*(\Omega(*))$ as the de Rham cohomology of the function field of M .

For the other spectral sequence
 $(**) \quad 'E_2^{p,q} \cong H^p(M, \mathcal{H}^q(\Omega(*)))$.

$\Gamma \quad \Omega(*): \Omega^0(*) \xrightarrow{d} \Omega^1(*) \rightarrow \dots \rightarrow \Omega^n(*) \rightarrow$
 $\mathcal{H}^p(\Omega(*))$ the p th cohomology sheaf

\Rightarrow By p 446,

$$'E_2^{p,q} = H^p(M, \mathcal{H}^q(\Omega(*)))$$

Now any spectral sequence gives an exact sequence in low degrees, which in this case is

$$0 \rightarrow 'E_2^{1,0} \rightarrow H^1 \rightarrow 'E_2^{0,1} \xrightarrow{d_2} 'E_2^{2,0} \rightarrow H^2 \rightarrow G \rightarrow 0,$$

where

$$G = H^2 / F^2 H^2 \text{ has the subgroup } G' = H^2 / F^1 H^2$$

with

$$G' \oplus G/G' \subset 'E_2^{1,1} \oplus 'E_2^{2,0} \xrightarrow{0,2}$$

a subgroup of $\ker d_2$.

Γ Consider the following exact sequence

$$0 \rightarrow \ker d_2 \rightarrow 'E_2^{0,1} \xrightarrow{d_2} 'E_2^{2,0} \rightarrow \text{coker } d_2 \rightarrow 0$$

① Note, from $H^1 / F^1 H^1 \cong 'E_\infty^{0,1}$

we have an exact sequence

$$0 \rightarrow 'F^1 H^1 \rightarrow H^1 \rightarrow 'E_\infty^{0,1} \rightarrow 0$$

② Note, $'E_2^{-2,0} \xrightarrow{d_2} 'E_2^{0,1} \xrightarrow{d_2} 'E_2^{2,0} \xrightarrow{d_2} 'E_2^{4,0-2+1} = 0$