

$$e \in \text{Ext}^{n-1}(M; f_Z, \Lambda^n \mathcal{E}^*).$$

FF

For example,  $n=3$

$$\Rightarrow 0 \rightarrow \Lambda^3 \mathcal{E}^* \rightarrow \Lambda^2 \mathcal{E}^* \rightarrow \mathcal{E}^* \xrightarrow{\alpha} f_Z \rightarrow 0$$

$$\Rightarrow 0 \rightarrow \Lambda^3 \mathcal{E}^* \rightarrow \Lambda^2 \mathcal{E}^* \rightarrow \ker \alpha \rightarrow 0 \dots 0$$

$$0 \rightarrow \ker \alpha \rightarrow \mathcal{E}^* \rightarrow f_Z \rightarrow 0 \dots \oplus$$

$$\Rightarrow \text{By } \textcircled{1}, \text{ we have } e_1 \in \text{Ext}^1(M; \ker \alpha, \Lambda^3 \mathcal{E}^*)$$

$$\text{By } \textcircled{2}, \quad " \quad e'_1 \in \text{Ext}^1(M; f_Z, \ker \alpha).$$

$\Rightarrow$  By 3 on P101,

$$\begin{array}{c} \text{Ext}^1(M; f_Z, \ker \alpha) \otimes \text{Ext}^1(M; \ker \alpha, \Lambda^3 \mathcal{E}^*) \rightarrow \text{Ext}^2(M; f_Z, \Lambda^3 \mathcal{E}^*) \\ \downarrow e_1 \quad \quad \quad \otimes \quad \quad \quad \downarrow e'_1 \quad \quad \quad \longrightarrow \quad \quad \quad \downarrow e_2 \end{array}$$

$$\Rightarrow 0 \rightarrow \Lambda^3 \mathcal{E}^* \rightarrow \Lambda^2 \mathcal{E}^* \rightarrow \mathcal{E}^* \rightarrow f_Z \rightarrow 0 \text{ gives}$$

an element

$$e_2 \in \text{Ext}^2(M; f_Z, \Lambda^3 \mathcal{E}^*).$$

See P82 ~ P87 MacLane, Homology for details.  $\square$

In the spectral sequence relating global and local Ext's we consider

$$d_{n-1}: H^0(M; \underline{\text{Ext}}_O^{n-1}(f_Z, \Lambda^n \mathcal{E}^*)) \rightarrow H^n(M, \Lambda^n \mathcal{E}^*),$$

where we have used the isomorphism