DATE . . PAGE

To construct $\mathrm{Ext}^1_{\mathcal{O}}(M, N)$, we start with part of a projective resolution

$$E_2 \longrightarrow E_1 \longrightarrow E_0 \longrightarrow M \longrightarrow 0$$

and take kernel / image in

$$\mathrm{Hom}_{\mathcal{O}}(E_0, N) \longrightarrow \mathrm{Hom}_{\mathcal{O}}(E_1, N) \longrightarrow \mathrm{Hom}_{\mathcal{O}}(E_2, N).$$

⌈ See P684 for the definition. ⌋

Thus a cycle gives a map $E_1/E_2 \longrightarrow N$, and so a class in $\mathrm{Ext}^1_{\mathcal{O}}(M, N)$ gives the data

$$\left\{ \begin{array}{l} 0 \longrightarrow E_1/E_2 \longrightarrow E_0 \longrightarrow M \longrightarrow 0, \\ \\ E_1/E_2 \longrightarrow N \end{array} \right.$$

.

⌈

$$\begin{array}{ccccc} \mathrm{Hom}_{\mathcal{O}}(E_0, N) & \xrightarrow{\delta} & \mathrm{Hom}_{\mathcal{O}}(E_1, N) & \xrightarrow{\delta} & \mathrm{Hom}_{\mathcal{O}}(E_2, N) \\ & & \Psi & & \\ & & f & \longmapsto & \delta(f) = f \circ \partial \end{array}$$

If $\delta(f) = 0$, then $f = 0$ on $\partial(E_2) \subset E_1$.

E_1/E_2 means $E_1/\partial E_2$.

f defines a map from $E_1/\partial E_2$ to N as follows: $e_1 + \partial E_2 \longmapsto f(e_1)$.

Since $E_2 \xrightarrow{\partial} E_1 \xrightarrow{\partial} E_0 \xrightarrow{\partial} M \to 0$ is exact,

$$0 \longrightarrow E_1/\partial E_2 \longrightarrow E_0 \longrightarrow M \longrightarrow 0 \text{ is exact.}$$ ⌋

MOOKEUK CO.