

$$\Rightarrow \psi(\partial(1_M)) = [(0 \rightarrow N \rightarrow E \rightarrow M \rightarrow 0)] \dots \textcircled{1}$$

$$(\Rightarrow \psi \circ \Phi([(0 \rightarrow N \rightarrow E \rightarrow M \rightarrow 0)]) = [(0 \rightarrow N \rightarrow E \rightarrow M \rightarrow 0)])$$

Given $[f] \in \text{Ext}_0^1(M, N)$, $f \in \text{Hom}(E_1, N)$

then

$$\psi(f) = [(0 \rightarrow N \xrightarrow{\alpha} N \oplus E_1 \xrightarrow[\mu(E_1/\partial E_1)]{E_1} M \rightarrow 0)]$$

$$\mu: E_1/\partial E_1 \longrightarrow N \oplus E_1$$

$$\begin{matrix} \downarrow \\ e_1 + \partial E_1 \end{matrix} \longmapsto (f(e_1), \partial(e_1))$$

What is $\Phi \circ \psi(f)$?

$$0 \longrightarrow N \longrightarrow E \longrightarrow M \longrightarrow 0$$

$$\begin{array}{ccccccc} 0 & \longrightarrow & \text{Hom}(M, N) & \longrightarrow & \text{Hom}(M, E) & \longrightarrow & \text{Hom}(M, M) \\ & & \downarrow & & \downarrow & & \downarrow 1_M \\ 0 & \longrightarrow & \text{Hom}(E_0, N) & \longrightarrow & \text{Hom}(E_0, E) & \longrightarrow & \text{Hom}(E_0, M) \xrightarrow{\gamma} 0 \\ & & \downarrow & & \delta \downarrow & & \downarrow \gamma \\ 0 & \longrightarrow & \text{Hom}(E_1, N) & \longrightarrow & \text{Hom}(E_1, E) & \longrightarrow & \text{Hom}(E_1, M) \longrightarrow 0 \\ & & \downarrow \omega & & \downarrow \delta \omega & & \downarrow \\ 0 & \longrightarrow & \text{Hom}(E_2, N) & \longrightarrow & \text{Hom}(E_2, E) & \longrightarrow & \text{Hom}(E_2, M) \longrightarrow 0 \end{array}$$

$$\begin{array}{c} E_0 \\ \downarrow \gamma \\ 0 \longrightarrow N \xrightarrow{\alpha} E \xrightarrow{\beta} M \longrightarrow 0 \end{array}$$

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