

$$\begin{array}{ccccc}
 & & & V \otimes W & \\
 & & \nearrow \kappa & \downarrow \phi_{\tilde{\kappa}} & \\
 & & & V \tilde{\otimes} W & \\
 V \times W & \xrightarrow{\tilde{\kappa}} & & \downarrow \phi_{\kappa} & \\
 & \searrow \kappa & & V \otimes W &
 \end{array}$$