

$$\begin{array}{ccccc}
& & V^V & \xlongequal{\quad} & V^V \\
& & \downarrow & & \downarrow \\
\bullet & \xrightarrow{\text{TCof}} & \bullet & \xrightarrow{\quad} & V^U \\
& & \downarrow & & \downarrow \\
& & \text{TFib} & & \\
\bullet & \xrightarrow[\text{TCof}]{g} & \bullet & \xrightarrow{\quad} & V
\end{array} \in \mathcal{U} \cap \mathcal{V}$$