

$$\begin{array}{ccc}
 X & \xrightarrow{F} & Y \\
 \phi \downarrow & & \downarrow \varphi \\
 U & \xrightarrow[f = \varphi \circ F \circ \phi^{-1}]{z \mapsto z^k} & \tilde{U}
 \end{array}$$