

$$\begin{array}{ccc}
 S & \xrightarrow{\eta} & U\mathbb{Z}\{S\} \\
 & \searrow \phi & \downarrow U\tilde{\phi} \\
 & & UA
 \end{array}$$

$$\begin{array}{ccc}
 & & \mathbb{Z}\{S\} \\
 & & \downarrow \tilde{\phi} \\
 & & A
 \end{array}$$