

$$\begin{array}{ccccc}
C_*^e(S^V) \otimes C_*^e(S^W) & & & & \\
\downarrow 1 \otimes (-)^* & & & & \\
C_*^e(S^V) \otimes C_*^e(S^{-W}) & & & & \\
\downarrow \otimes & & & & \\
\begin{array}{ccccc}
C_4 \curvearrowright & C_*^e(S^{V-W}) & \xrightarrow{H_*} & H_*^e(S^{V-W}) & \curvearrowleft C_4 \\
& \uparrow \text{Res} \quad \downarrow \text{Tr} & & \uparrow \text{Res} \quad \downarrow \text{Tr} & \\
C_4/C_2 \curvearrowright & C_*^{C_2}(S^{V-W}) & \xrightarrow{H_*} & H_*^{C_2}(S^{V-W}) & \curvearrowleft C_4/C_2 \\
& \uparrow \text{Res} \quad \downarrow \text{Tr} & & \uparrow \text{Res} \quad \downarrow \text{Tr} & \\
& C_*^{C_4}(S^{V-W}) & \xrightarrow{H_*} & H_*^{C_4}(S^{V-W}) &
\end{array}
\end{array}$$