

$$\begin{array}{ccccccc}
 \dots & \longrightarrow & \Omega^q(V) & \xrightarrow{\quad \mathrm{d} \quad} & \Omega^{q+1}(V) & \longrightarrow & \dots \\
 & & \downarrow f^* & & \downarrow f^* & & \\
 \dots & \longrightarrow & \Omega^q(U) & \xrightarrow{\quad \mathrm{d} \quad} & \Omega^{q+1}(U) & \longrightarrow & \dots
 \end{array}$$