

$$\begin{array}{ccc}
 S(\mathbf{X}_f * \mathbf{X}_g) & \xrightarrow{\quad} & \mathbf{Y}_g \\
 \text{coh} \downarrow & & \uparrow \text{Id} \\
 S(\mathbf{X}_f) \times S(\mathbf{X}_g) & \xrightarrow{\text{ro}_{f\%g}} & \mathbf{Y}_g
 \end{array}$$