

$$\begin{aligned}
 ((f \otimes g) \circ \text{br}_{Y,U})^\star(x,z) &= \langle f^\star(x), g^\star(z) \rangle \circ \text{br}_{Y,U} \\
 &= \left\langle \bigcup_{z' \in g^\star(z)} \uparrow z', \bigcup_{x' \in f^\star(x)} \uparrow x' \right\rangle.
 \end{aligned}$$