

$$\begin{array}{c}
\frac{}{\vdash p^\perp \Downarrow [\cdot][\cdot]p; \cdot} \text{I} \quad \frac{}{\vdash q^\perp \Downarrow [\cdot][\cdot]q; \cdot} \text{I} \\
\hline
\vdash p^\perp \otimes q^\perp \Downarrow [\cdot][\cdot]p, q; \cdot \quad \otimes \\
\hline
\vdash [\cdot][4 : q]\cdot; \cdot //^1 \vdash [\cdot][\cdot]p, p^\perp \otimes q^\perp; \cdot \quad \text{K} \\
\hline
\vdash [\cdot][5 : p, 4 : q]\cdot; \cdot //^1 \vdash [\cdot][\cdot]p^\perp \otimes q^\perp; \cdot \quad \text{K} \\
\hline
\vdash [\cdot][5 : p, 4 : q]\cdot; \cdot //^1 \vdash [\cdot][\cdot]\cdot; p^\perp \otimes q^\perp \quad * \\
\hline
\vdash !^1 p^\perp \otimes q^\perp \Downarrow [\cdot][5 : p, 4 : q]\cdot; \cdot \quad ! \\
\hline
\vdash [\cdot][4 : q]\cdot; \cdot //^2 \vdash [\cdot][5 : p]!^1 p^\perp \otimes q^\perp; \cdot \quad 4 \\
\hline
\vdash [\cdot][5 : p, 4 : q]\cdot; \cdot //^2 \vdash [\cdot][\cdot]!^1 p^\perp \otimes q^\perp; \cdot \quad 4 \\
\hline
\vdash [\cdot][5 : p, 4 : q]\cdot; \cdot //^2 \vdash [\cdot][\cdot]\cdot; !^1 p^\perp \otimes q^\perp \quad * \\
\hline
\vdash !^2 !^1 p^\perp \otimes q^\perp \Downarrow [\cdot][5 : p, 4 : q]\cdot; \cdot \quad ! \\
\hline
\vdash [\cdot][\cdot]\cdot; ?^4 q, ?^5 p, !^2 !^1 p^\perp \otimes q^\perp \quad *
\end{array}$$