

Diagrammatic equation showing the equivalence between a crossing and a box diagram in a tensor network.

**Left side (Crossing):** Two external legs, labeled  $i_1$  and  $i_2$ , cross at a central vertex. The upper leg is blue and the lower leg is light blue. From the crossing, two paths emerge: a top path labeled  $k_2$  and a bottom path labeled  $k_1$ . These paths lead to a box structure. The top path connects to a vertex labeled  $j_2$ , and the bottom path connects to a vertex labeled  $j_1$ . The box is formed by a vertical line on the right and horizontal lines at the top and bottom. The top horizontal line is labeled  $j_1$ . The bottom horizontal line is labeled  $i_2$ . The right vertical line is labeled  $j_2$ . The bottom right corner has a small black L-shaped symbol.

**Right side (Box):** A box diagram with two external legs, labeled  $i_1$  and  $i_2$ , entering from the left. The top leg is blue and the bottom leg is light blue. The box is formed by a vertical line on the right and horizontal lines at the top and bottom. The top horizontal line is labeled  $j_2$ , and the bottom horizontal line is labeled  $j_1$ . The right vertical line is labeled  $i_2$ . The bottom right corner has a small black L-shaped symbol.

The two diagrams are connected by an equals sign ( $=$ ), indicating they are equivalent.