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Das System der trajektischen thematischen Relationen

1. Im folgenden wird das System der 81 trajektischen Dualsysteme (vgl. Toth 2025) als duales Abbildungssystem mit thematischen Austauschrelationen konstruiert.

2. Die 81 trajektischen dualen Abbildungssysteme

$$\begin{array}{ccc} (1.1, 1.1) & & (1.1 \mid 1.1) \\ \parallel & \parallel & \parallel \quad \parallel \\ \times & (1.1 \mid 1.1) & (1.1, 1.1) \\ MM & \rightleftharpoons & MM \end{array}$$

$$\begin{array}{ccc} (1.1, 1.2) & & (1.1 \mid 1.2) \\ \downarrow & \uparrow & \downarrow \quad \uparrow \\ \times & (2.1 \mid 1.1) & (2.1, 1.1) \\ OM & \rightleftharpoons & OM \end{array}$$

$$\begin{array}{ccc} (1.1, 1.3) & & (1.1 \mid 1.3) \\ \downarrow & \uparrow & \downarrow \quad \uparrow \\ \times & (3.1 \mid 1.1) & (3.1, 1.1) \\ IM & \rightleftharpoons & IM \end{array}$$

$$\begin{array}{ccc} (1.1, 2.1) & & (1.2 \mid 1.1) \\ \downarrow & \uparrow & \uparrow \quad \downarrow \\ \times & (1.2, 1.1) & (1.1 \mid 2.1) \\ MM & \rightleftharpoons & MO \end{array}$$

$$\begin{array}{ccc}
(1.1, 2.2) & & (1.2 \mid 1.2) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (2.2, 1.1) & & (2.1 \mid 2.1) \\
\text{OM} & \rightleftharpoons & \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(1.1, 2.3) & & (1.2 \mid 1.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (3.2, 1.1) & & (3.1 \mid 2.1) \\
\text{IM} & \rightleftharpoons & \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(1.1, 3.1) & & (1.3 \mid 1.1) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times \quad (1.3, 1.1) & & (1.1 \mid 3.1) \\
\text{MM} & \rightleftharpoons & \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(1.1, 3.2) & & (1.3 \mid 1.2) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (2.3, 1.1) & & (2.1 \mid 3.1) \\
\text{OM} & \rightleftharpoons & \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(1.1, 3.3) & & (1.3 \mid 1.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (3.3, 1.1) & & (3.1 \mid 3.1) \\
\text{IM} & \rightleftharpoons & \text{II}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 1.1) & & (1.1 \mid 2.1) \\
\uparrow & \downarrow & \\
\times & (1.1, 2.1) & (1.2 \mid 1.1) \\
& \text{MO} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 1.2) & & (1.1 \mid 2.2) \\
\downarrow & \downarrow & \\
\times & (2.1, 2.1) & (2.2 \mid 1.1) \\
& \text{OO} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 1.3) & & (1.1 \mid 2.3) \\
\downarrow & \downarrow & \\
\times & (3.1, 2.1) & (3.2 \mid 1.1) \\
& \text{IO} & \rightleftharpoons \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 2.1) & & (1.2 \mid 2.1) \\
\parallel & \parallel & \\
\times & (1.2, 2.1) & (1.2 \mid 2.1) \\
& \text{MO} & \rightleftharpoons \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 2.2) & & (1.2 \mid 2.2) \\
\downarrow & \uparrow & \\
\times & (2.2, 2.1) & (2.2 \mid 2.1) \\
& \text{OO} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 2.3) & & (1.2 \mid 2.3) \\
\downarrow & \uparrow & \downarrow \quad \uparrow \\
\times \quad (3.2, 2.1) & & (3.2 \mid 2.1) \\
\text{IO} & \rightleftharpoons & \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 3.1) & & (1.3 \mid 2.1) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times \quad (1.3, 2.1) & & (1.2 \mid 3.1) \\
\text{MO} & \rightleftharpoons & \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 3.2) & & (1.3 \mid 2.2) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (2.3, 2.1) & & (2.2 \mid 3.1) \\
\text{OO} & \rightleftharpoons & \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(1.2, 3.3) & & (1.3 \mid 2.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times \quad (3.3, 2.1) & & (3.2 \mid 3.1) \\
\text{IO} & \rightleftharpoons & \text{II}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 1.1) & & (1.1 \mid 3.1) \\
\uparrow & \downarrow & \downarrow \quad \uparrow \\
\times \quad (1.1, 3.1) & & (1.3 \mid 1.1) \\
\text{MI} & \rightleftharpoons & \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 1.2) & & (1.1 \mid 3.2) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (2.1, 3.1) & (2.3 \mid 1.1) \\
& \text{OI} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 1.3) & & (1.1 \mid 3.3) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (3.1, 3.1) & (3.3 \mid 1.1) \\
& \text{II} & \rightleftharpoons \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 2.1) & & (1.2 \mid 3.1) \\
\uparrow & \downarrow & \downarrow \quad \uparrow \\
\times & (1.2, 3.1) & (1.3 \mid 2.1) \\
& \text{MI} & \rightleftharpoons \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 2.2) & & (1.2 \mid 3.2) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (2.2, 3.1) & (2.3 \mid 2.1) \\
& \text{OI} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 2.3) & & (1.2 \mid 3.3) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (3.2, 3.1) & (3.3 \mid 2.1) \\
& \text{II} & \rightleftharpoons \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 3.1) & & (1.3 \mid 3.1) \\
\parallel & \parallel & \\
\times & (1.3, 3.1) & (1.3 \mid 3.1) \\
& \text{MI} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 3.2) & & (1.3 \mid 3.2) \\
\downarrow & \uparrow & \\
\times & (2.3, 3.1) & (2.3 \mid 3.1) \\
& \text{OI} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(1.3, 3.3) & & (1.3 \mid 3.3) \\
\downarrow & \uparrow & \\
\times & (3.3, 3.1) & (3.3 \mid 3.1) \\
& \text{II} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 1.1) & & (2.1 \mid 1.1) \\
\uparrow & \downarrow & \\
\times & (1.1, 1.2) & (1.1 \mid 1.2) \\
& \text{MM} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 1.2) & & (2.1 \mid 1.2) \\
\parallel & \parallel & \\
\times & (2.1, 1.2) & (2.1 \mid 1.2) \\
& \text{OM} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 1.3) & & (2.1 \mid 1.3) \\
\downarrow & \uparrow & \downarrow \quad \uparrow \\
\times & (3.1, 1.2) & (3.1 \mid 1.2) \\
& \text{IM} & \rightleftharpoons \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 2.1) & & (2.2 \mid 1.1) \\
\uparrow & \downarrow & \uparrow \quad \downarrow \\
\times & (1.2, 1.2) & (1.1 \mid 2.2) \\
& \text{MM} & \rightleftharpoons \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 2.2) & & (2.2 \mid 1.2) \\
\downarrow & \uparrow & \uparrow \quad \uparrow \\
\times & (2.2, 1.2) & (2.1 \mid 2.2) \\
& \text{OM} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 2.3) & & (2.2 \mid 1.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times & (3.2, 1.2) & (3.1 \mid 3.2) \\
& \text{IM} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 3.1) & & (2.3 \mid 1.1) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (1.3, 1.2) & (1.1 \mid 3.2) \\
& \text{MM} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 3.2) & & (2.3 \mid 1.2) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times & (2.3, 1.2) & (2.1 \mid 3.2) \\
& \text{OM} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(2.1, 3.3) & & (2.3 \mid 1.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times & (3.3, 1.2) & (3.1 \mid 3.2) \\
& \text{IM} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 1.1) & & (2.1 \mid 2.1) \\
\uparrow & \downarrow & \uparrow \quad \uparrow \\
\times & (1.1, 2.2) & (1.2 \mid 1.2) \\
& \text{MO} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 1.2) & & (2.1 \mid 2.2) \\
\uparrow & \downarrow & \downarrow \quad \uparrow \\
\times & (2.1, 2.2) & (2.2 \mid 1.2) \\
& \text{OO} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 1.3) & & (2.1 \mid 2.3) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (3.1, 2.2) & (3.2 \mid 1.2) \\
& \text{IO} & \rightleftharpoons \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 2.1) & & (2.2 \mid 2.1) \\
\uparrow & \downarrow & \uparrow \quad \downarrow \\
\times & (1.2, 2.2) & (1.2 \mid 2.2) \\
& \text{MO} & \rightleftharpoons \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 2.2) & & (2.2 \mid 2.2) \\
\parallel & \parallel & \parallel \quad \parallel \\
\times & (2.2, 2.2) & (2.2 \mid 2.2) \\
& \text{OO} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 2.3) & & (2.2 \mid 2.3) \\
\downarrow & \uparrow & \downarrow \quad \uparrow \\
\times & (3.2, 2.2) & (3.2 \mid 2.2) \\
& \text{IO} & \rightleftharpoons \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 3.1) & & (2.3 \mid 2.1) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (1.3, 2.2) & (1.2 \mid 3.2) \\
& \text{MO} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 3.2) & & (2.3 \mid 2.2) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times & (2.3, 2.2) & (2.2 \mid 3.2) \\
& \text{OO} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(2.2, 3.3) & & (2.3 \mid 2.3) \\
\downarrow & \uparrow & \downarrow \quad \downarrow \\
\times & (3.3, 2.2) & (3.2 \mid 3.2) \\
\text{IO} & \rightleftharpoons & \text{II}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 1.1) & & (2.1 \mid 3.1) \\
\uparrow & \downarrow & \uparrow \quad \uparrow \\
\times & (1.1, 3.2) & (1.3 \mid 1.2) \\
\text{MI} & \rightleftharpoons & \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 1.2) & & (2.1 \mid 3.2) \\
\uparrow & \downarrow & \downarrow \quad \uparrow \\
\times & (2.1, 3.2) & (2.3 \mid 1.2) \\
\text{OI} & \rightleftharpoons & \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 1.3) & & (2.1 \mid 3.3) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (3.1, 3.2) & (3.3 \mid 1.2) \\
\text{II} & \rightleftharpoons & \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 2.1) & & (2.2 \mid 3.1) \\
\uparrow & \downarrow & \uparrow \quad \uparrow \\
\times & (1.2, 3.2) & (1.3 \mid 2.2) \\
\text{MI} & \rightleftharpoons & \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 2.2) & & (2.2 \mid 3.2) \\
\uparrow & \downarrow & \downarrow \quad \uparrow \\
\times & (2.2, 3.2) & (2.3 \mid 2.2) \\
& \text{OI} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 2.3) & & (2.2 \mid 3.3) \\
\downarrow & \downarrow & \downarrow \quad \uparrow \\
\times & (3.2, 3.2) & (3.3 \mid 2.2) \\
& \text{II} & \rightleftharpoons \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 3.1) & & (2.3 \mid 3.1) \\
\uparrow & \downarrow & \uparrow \quad \downarrow \\
\times & (1.3, 3.2) & (1.3 \mid 3.2) \\
& \text{MI} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 3.2) & & (2.3 \mid 3.2) \\
\parallel & \parallel & \parallel \quad \parallel \\
\times & (2.3, 3.2) & (2.3 \mid 3.2) \\
& \text{OI} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(2.3, 3.3) & & (2.3 \mid 3.3) \\
\downarrow & \uparrow & \downarrow \quad \uparrow \\
\times & (3.3, 3.2) & (3.3 \mid 3.2) \\
& \text{II} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 1.1) & & (3.1 \mid 1.1) \\
\uparrow & \downarrow & \uparrow \quad \downarrow \\
\times & (1.1, 1.3) & (1.1 \mid 1.3) \\
& \text{MM} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 1.2) & & (3.1 \mid 1.2) \\
\uparrow & \downarrow & \uparrow \quad \downarrow \\
\times & (2.1, 1.3) & (2.1 \mid 1.3) \\
& \text{OM} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 1.3) & & (3.1 \mid 1.3) \\
\parallel & \parallel & \parallel \quad \parallel \\
\times & (3.1, 1.3) & (3.1 \mid 1.3) \\
& \text{IM} & \rightleftharpoons \text{IM}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 2.1) & & (3.2 \mid 1.1) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (1.2, 1.3) & (1.1 \mid 2.3) \\
& \text{MM} & \rightleftharpoons \text{MO}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 2.2) & & (3.2 \mid 1.2) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (2.2, 1.3) & (2.1 \mid 2.3) \\
& \text{OM} & \rightleftharpoons \text{OO}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 2.3) & & (3.2 \mid 1.3) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times & (3.2, 1.3) & (3.1 \mid 2.3) \\
& \text{IM} & \rightleftharpoons \text{IO}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 3.1) & & (3.3 \mid 1.1) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (1.3, 1.3) & (1.1 \mid 3.3) \\
& \text{MM} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 3.2) & & (3.3 \mid 1.2) \\
\uparrow & \uparrow & \uparrow \quad \downarrow \\
\times & (2.3, 1.3) & (2.1 \mid 3.3) \\
& \text{OM} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(3.1, 3.3) & & (3.3 \mid 1.3) \\
\downarrow & \uparrow & \uparrow \quad \downarrow \\
\times & (3.3, 1.3) & (3.1 \mid 3.3) \\
& \text{IM} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(3.2, 1.1) & & (3.1 \mid 2.1) \\
\uparrow & \downarrow & \uparrow \quad \uparrow \\
\times & (1.1, 2.3) & (1.2 \mid 1.3) \\
& \text{MO} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
& (3.2, 1.2) & (3.1 \mid 2.2) \\
& \uparrow \quad \downarrow & \uparrow \quad \uparrow \\
\times & (2.1, 2.3) & (2.2 \mid 1.3) \\
& 00 \quad \quad \quad \rightleftharpoons & 0M
\end{array}$$

$$\begin{array}{ccc}
& (3.2, 1.3) & (3.1 \mid 2.3) \\
& \uparrow \quad \downarrow & \downarrow \quad \uparrow \\
\times & (3.1, 2.3) & (3.2 \mid 1.3) \\
& IO \quad \quad \quad \rightleftharpoons & IM
\end{array}$$

$$\begin{array}{ccc}
& (3.2, 2.1) & (3.2 \mid 2.1) \\
& \uparrow \quad \downarrow & \uparrow \quad \downarrow \\
\times & (1.2, 2.3) & (1.2 \mid 2.3) \\
& MO \quad \quad \quad \rightleftharpoons & MO
\end{array}$$

$$\begin{array}{ccc}
& (3.2, 2.2) & (3.2 \mid 2.2) \\
& \uparrow \quad \downarrow & \uparrow \quad \downarrow \\
\times & (2.2, 2.3) & (2.2 \mid 2.3) \\
& 00 \quad \quad \quad \rightleftharpoons & 00
\end{array}$$

$$\begin{array}{ccc}
& (3.2, 2.3) & (3.2 \mid 2.3) \\
& \parallel \quad \parallel & \parallel \quad \parallel \\
\times & (3.2, 2.3) & (3.2 \mid 2.3) \\
& IO \quad \quad \quad \rightleftharpoons & IO
\end{array}$$

$$\begin{array}{ccc}
(3.2, 3.1) & (3.3 \mid 2.1) \\
\uparrow \quad \uparrow & \uparrow \quad \downarrow \\
\times \quad (1.3, 2.3) & (1.2 \mid 3.3) \\
\text{MO} & \rightleftharpoons \text{MI}
\end{array}$$

$$\begin{array}{ccc}
(3.2, 3.2) & (3.3 \mid 2.2) \\
\uparrow \quad \uparrow & \uparrow \quad \downarrow \\
\times \quad (2.3, 2.3) & (2.2 \mid 3.3) \\
\text{OO} & \rightleftharpoons \text{OI}
\end{array}$$

$$\begin{array}{ccc}
(3.2, 3.3) & (3.3 \mid 2.3) \\
\downarrow \quad \uparrow & \uparrow \quad \downarrow \\
\times \quad (3.3, 2.3) & (3.2 \mid 3.3) \\
\text{IO} & \rightleftharpoons \text{II}
\end{array}$$

$$\begin{array}{ccc}
(3.3, 1.1) & (3.1 \mid 3.1) \\
\uparrow \quad \downarrow & \uparrow \quad \uparrow \\
\times \quad (1.1, 3.3) & (1.3 \mid 1.3) \\
\text{MI} & \rightleftharpoons \text{MM}
\end{array}$$

$$\begin{array}{ccc}
(3.3, 1.2) & (3.1 \mid 3.2) \\
\uparrow \quad \downarrow & \uparrow \quad \uparrow \\
\times \quad (2.1, 3.3) & (2.3 \mid 1.3) \\
\text{OI} & \rightleftharpoons \text{OM}
\end{array}$$

$$\begin{array}{ccc}
& (3.3, 1.3) & (3.1 \mid 3.3) \\
& \uparrow \quad \downarrow & \downarrow \quad \uparrow \\
\times & (3.1, 3.3) & (3.3 \mid 1.3) \\
& \text{II} \quad \quad \quad \rightleftharpoons & \text{IM}
\end{array}$$

$$\begin{array}{ccc}
& (3.3, 2.1) & (3.2 \mid 3.1) \\
& \uparrow \quad \downarrow & \uparrow \quad \uparrow \\
\times & (1.2, 3.3) & (1.3 \mid 2.3) \\
& \text{MI} \quad \quad \quad \rightleftharpoons & \text{M0}
\end{array}$$

$$\begin{array}{ccc}
& (3.3, 2.2) & (3.2 \mid 3.2) \\
& \uparrow \quad \downarrow & \uparrow \quad \uparrow \\
\times & (2.2, 3.3) & (2.3 \mid 2.3) \\
& \text{OI} \quad \quad \quad \rightleftharpoons & \text{00}
\end{array}$$

$$\begin{array}{ccc}
& (3.3, 2.3) & (3.2 \mid 3.3) \\
& \uparrow \quad \downarrow & \downarrow \quad \uparrow \\
\times & (3.2, 3.3) & (3.3 \mid 2.3) \\
& \text{II} \quad \quad \quad \rightleftharpoons & \text{I0}
\end{array}$$

$$\begin{array}{ccc}
& (3.3, 3.1) & (3.3 \mid 3.1) \\
& \uparrow \quad \downarrow & \uparrow \quad \downarrow \\
\times & (1.3, 3.3) & (1.3 \mid 3.3) \\
& \text{MI} \quad \quad \quad \rightleftharpoons & \text{MI}
\end{array}$$

$$\begin{array}{ccc}
 (3.3, 3.2) & & (3.3 \mid 3.2) \\
 \uparrow \quad \downarrow & & \uparrow \quad \downarrow \\
 \times \quad (2.3, 3.3) & & (2.3 \mid 3.3) \\
 \text{OI} & \rightleftharpoons & \text{OI}
 \end{array}$$

$$\begin{array}{ccc}
 (3.3, 3.3) & & (3.3 \mid 3.3) \\
 \parallel \quad \parallel & & \parallel \quad \parallel \\
 \times \quad (3.3, 3.3) & & (3.3 \mid 3.3) \\
 \text{II} & \rightleftharpoons & \text{II}
 \end{array}$$

Literatur

Toth, Alfred, Trajektische Dualrelationen. In: Electronic Journal for Mathematical Semiotics, 2025

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