

causal-bijection-interleaving^{11,40}

$\forall es:\mathbb{E}\mathbb{S}, P, Q:(\mathbb{E}\rightarrow\mathbb{P}), f:(\{e:\mathbb{E}\mid P(e)\}\rightarrow\{e:\mathbb{E}\mid Q(e)\})$.
 $\text{Bij}(\{e:\mathbb{E}\mid P(e)\};\{e:\mathbb{E}\mid Q(e)\};f)$
 $\Rightarrow (\forall e:\{e:\mathbb{E}\mid P(e)\}. e \text{ c}\leq f(e))$
 $\Rightarrow e.f(e)$ is c< preserving on $e.P(e)$
 $\Rightarrow (\forall e, e':\{e:\mathbb{E}\mid P(e)\}. (\neg(e' < e)) \Rightarrow e \text{ c}\leq e')$
 $\Rightarrow (\forall e, e':\{e:\mathbb{E}\mid P(e)\}. (e < e') \Rightarrow (\exists a:\{e:\mathbb{E}\mid Q(e)\}. ((e < a) \& (a < e'))))$
 $\Rightarrow (\forall e:\mathbb{E}. P(e) \Rightarrow (\forall a:\mathbb{E}. Q(a) \Rightarrow e \text{ c}\leq a \Rightarrow (a < f(e)) \Rightarrow \text{False}))$