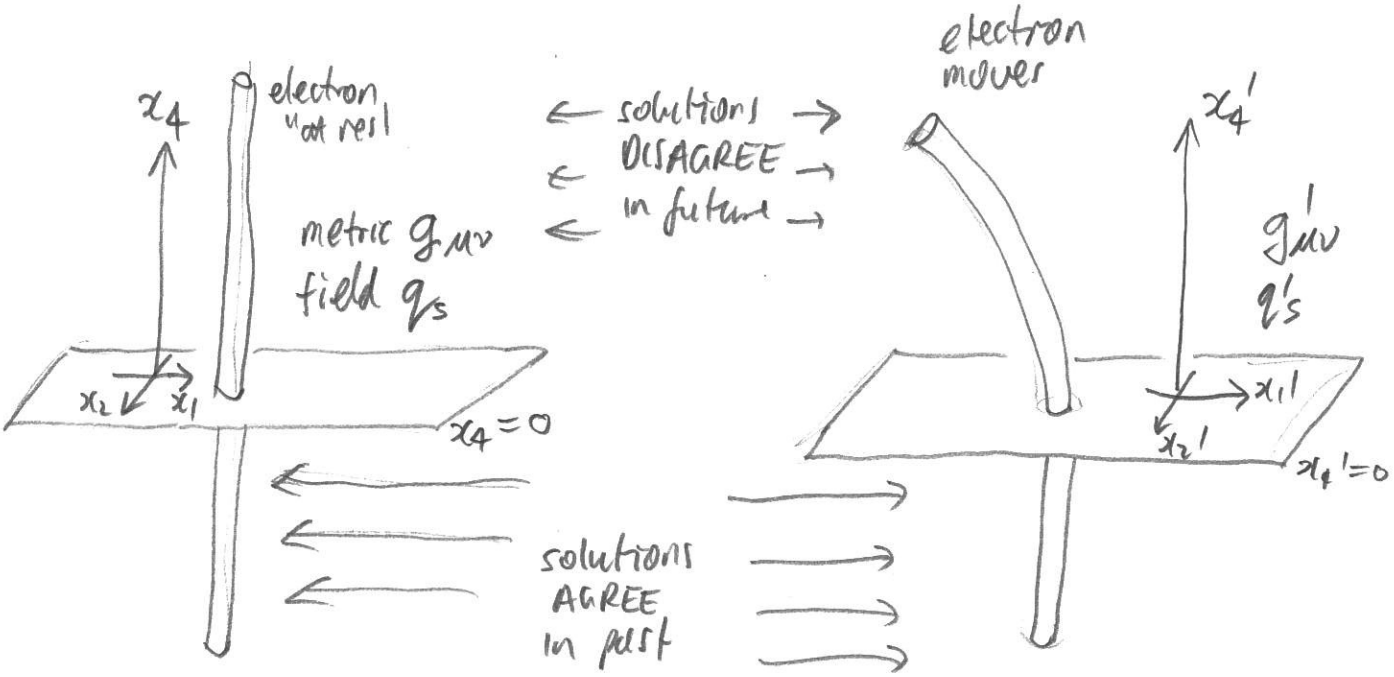
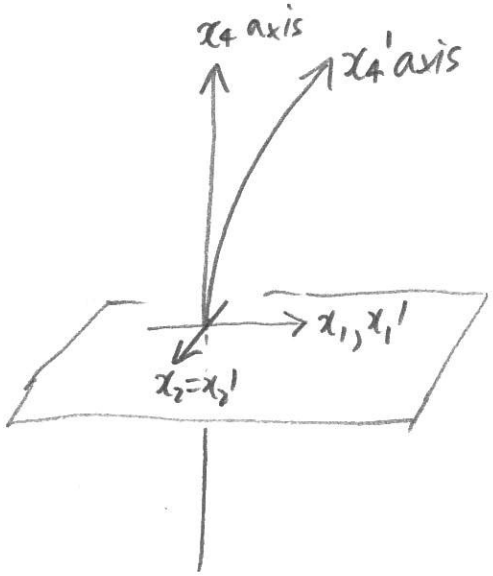
Hilbert, "Foundations of Physics"
Version of the hole argument
indeterminism



coordinate transformation

$$\begin{cases} x_4' \le 0 & x_1 = x_1' \\ x_4' > 0 & x_1 = x_1' + \exp\left(-\frac{1}{x_4'}\right) \end{cases}$$

$$x_2 = x_2'$$
$$x_3 = x_3'$$
$$x_4 = x_4'$$



Hilbert's Escape

3 ways to be physically meaningful

(1) Asserted in invariant coordinate system

(2) Asserted that there exists a coordinate system in which ...

(3) Statement is true in all coordinate systems