Dilatace času a kontrakce délek

$$\tilde{t} = \frac{t - vx/c^2}{\sqrt{1 - \frac{v^2}{c^2}}} \quad ; \quad \tilde{x} = \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$t = \frac{\tilde{t} + \frac{v\tilde{x}}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}} \quad ; \quad x = \frac{\tilde{x} + v\tilde{t}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

konečné časové a prostorové intervaly $\Delta t, \Delta x$

$$\Delta \tilde{t} = \frac{\Delta t - v\Delta x/c^2}{\sqrt{1 - \frac{v^2}{c^2}}} \quad ; \quad \Delta \tilde{x} = \frac{\Delta x - v\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\Delta t = \frac{\Delta \tilde{t} + \frac{v\Delta \tilde{x}}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}} \quad ; \quad \Delta x = \frac{\Delta \tilde{x} + v\Delta \tilde{t}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\Delta \tilde{t} = \Delta t_0 \quad , \quad \Delta \tilde{x} = 0 \qquad \longleftarrow \text{hodiny se v s. ústavě hepuhybuí}$$

$$\Delta t = \frac{\Delta t_0}{\sqrt{1 - \frac{v^2}{c^2}}} \implies \Delta t = \Delta t_0 \cdot \gamma$$

$$\Delta t = 0 \quad , \quad \Delta \tilde{x} = \Delta x_0$$

délka

$$\Delta x_0 = \frac{\Delta x}{\sqrt{1 - \frac{v^2}{c^2}}} \implies \Delta x = \Delta x_0 \cdot \sqrt{1 - \frac{v^2}{c^2}} = \frac{\Delta x_0}{\gamma}$$