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The Real Meaning of the Spacetime-Interval FLORENTIN SMARANDACHE, University of New Mexico — The spacetime interval is measured in light-meters. One light-meter means the time it takes the light to go one meter, i.e. $3 \cdot 10^{-9}$seconds. One can rewrite the spacetime interval as: $\Delta s^2 = c^2(\Delta t)^2 - [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]$. There are three possibilities: a)Δs^2 =0 which means that the Euclidean distance L_1L_2 between locations L_1 and L_2 is travelled by light in exactly the elapsed time Δt. The events of coordinates (x, y, z, t) in this case form the so-called light cone. b)$\Delta s^2 > 0$ which means that light travels an Euclidean distance greater than L_1L_2 in the elapsed time Δt. The below quantity in meters: $\Delta s = \sqrt{c^2(\Delta t)^2 - [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]}$ means that light travels further than L_2 in the prolongation of the straight line L_1L_2 within the elapsed time Δt. The events in this second case form the time-like region. c)$\Delta s^2 < 0$ which means that light travels less on the straight line L_1L_2. The below quantity, in meters: -$\Delta s = \sqrt{-c^2(\Delta t)^2 + [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]}$ means how much Euclidean distance is missing to the travelling light on straight line L_1L_2, starting from L_1 in order to reach L_2. The events in this third case form the space-like region. We consider a diagram with the location represented by a horizontal axis (L) on *[0,* ∞), the time represented by a vertical axis (t) on *[0,* ∞), perpendicular on (L), and the spacetime distance represented by an axis (Δs) perpendicular on the plane of the previous two axes. Axis (Δs) from *[0,* ∞) is extended down as ($-\Delta s$) on *[0,* ∞).

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