

11.1: Lorentz Transformation- Useful or Not?

Events and intervals only: Spacetime lean and spare

Events, and the intervals between events, define the layout of the physical world. No latticework of clocks there! Only events and the relation between event and event as expressed in the interval. That's spacetime physics, lean and spare, as it offers itself to us to meet the needs of industry, science, and understanding.

Or isolated events described using latticework

There's another way to express the same information and use it for the same purposes: Set up a free-float latticework of recording clocks, or the essential rudiments of such a latticework. The space and time coordinates of that Lorentz frame map each event as a lonesome individual, with no mention of any connection, any spacetime interval, to any other event.

Lorentz transformation: Translate event description from lattice to lattice

This lattice-based method for doing spacetime physics has the advantage that it can be mechanized and applied to event after event, wholesale. These regimented space and time coordinates then acquire full usefulness only when we can translate them from the clock-lattice frame used by one analyst to the clock-lattice frame used by another.

This scheme of translation has acquired the name "Lorentz transformation." Its usefulness depends on the user. Some never need it because they deal always with intervals. Others use it frequently because it regiments records and standardizes analysis. For their needs we insert this Special Topic on the Lorentz transformation. The reader may wish to read it now, or skip it altogether, or defer it until after Chapter 4,5 , or 6 . The later the better, in our opinion.

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