

In Special relativity, the motion of rod AB (which is an object in non inertial motion) can be described in the inertial reference frame and the motion of rod AB can be converted to be described in another inertial reference system, by Lorentz transformation.

In this paper, the "rod AB " with non inertial moving is studied, but it is not regarded as a reference system in this paper. Just the observers who are rest in K , measure the parameters of each point position on rod AB . The observers who are rest in K only use measuring instruments resting in K .

Then, using Lorentz transformation between K and K' , the parameters measured in K are transformed into the parameters in K' which is used to Calculate the momentum of the rod AB at two moments in K' .

When using Lorentz transformation, we only used the parameters measured by the observer rest on the inertial reference frames, the parameters measured by the observer rest on non-inertial reference frames haven't be used in paper. And we have not used any parameters measured by the observer rest on rod AB when using Lorentz transformation.

An object's sum of the rest masses of each part consists of the particles and the potential energy between its components.

Pallen(from <https://www.physicsforums.com>) thinks potential energy is not a conserved quantity even for a born rigid body. He hasn't confirmed $m_{sum\ 0\ OD}(t) = m_{sum\ 0\ OD}(t)'$.

The calculation result of the third section in paper (3. Velocity character of each position on AB in K') is consistent with the result of PAllen.

In fact, to eliminate the contradictory result of this paper, it is necessary that the potential energy of rod AB at t_1' is less than the potential energy at t_3' . Then,

$$m_{sum\ 0\ AB}(t_1') < m_{sum\ 0\ AB}(t_3')$$

But I think "that potential energy is a constant" is a characteristic of born rigid body. If the potential energy of a born rigid body changes, it is no longer a born rigid body. This has nothing to do with reference system.