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Space-time geometry, Modified Lorentz transformations, Dark energy and CPT-symmetric universe JAE-KWANG HWANG, JJJPL — We live in the 3-dimensional x1x2x3 space. The 4^{th} dimension is assigned as the absolute time (ct) axis and energy axis ($cP_t = E$). This 4^{th} dimension can be indirectly felt through the observable time (ct_l) and observable energy ($cP_{tl} = E$). The space-time distance is $d(x1x2x3x4) = ct_l$. The Lorentz transformations are proved and modified by using the present space-time geometry. This modified Lorentz transformations are approximated to the Lorentz transformations as $t \rightarrow t_l$ when $v/c << 1$ and to the Galilean transformations as v/c is close to zero. The twin paradox inflation and dark energy are explained in terms of the 4-dimension coordinate system. The geometrical space-time shape has the (x1,x2,x3,ct) coordinate system with the metric signature of (+ + + +) but not the (x1,x2,x3,ct_l) coordinate system with the metric signature of (+ - - -). It is shown that our matter universe and its partner antimatter universe can be created from the big bang of the matter and its partner antimatter. Therefore, the antimatters missing within our x1x2x3 universe full of the matters exist as the partner antimatters within the partner x1x2x3 universe. This partner x1x2x3 universe with the negative time momentum is full of the partner antimatters. See a following reference for more details. https://www.researchgate.net/publication/336069794

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