



Dual DSR

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We develop the physics of dual kappa Poincare algebra, which we will call dual DSR. First, we show that the dual kappa Poincare algebra is isomorphic to de Sitter algebra and its spacetime is essentially de Sitter spacetime. Second, we show how to derive the coproduct rules for Beltrami and conformal coordinates of de Sitter spacetime. It follows from the current literature on de Sitter relativity that the speed of light c and the de Sitter length are the two invariant scales of the physics of dual kappa Poincare algebra. Third, we derive the Casimir invariant of the dual kappa Poincare algebra and use this to derive an expression for the speed of light, our fourth result. Fifth, the field equation for the scalar field is derived from the Casimir invariant. The results for the coordinate speed of light and the scalar field theory are the same as in de Sitter theory in the planar coordinate basis. Thus, we have shown that the physics of dual kappa Poincare algebra (in the dual bicross product basis), which can be appropriately called dual DSR, is essentially de Sitter relativity. Finally, we note that dual DSR is not a quantum theory of spacetime but a quantum theory of momenta.

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