Reichenbach and the Prehistory of the Dynamical Approach to Special Relativity

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The paper aims to revisit Reichenbach's interpretation of special relativity, making two different but interrelated claims: (I) Reichenbach's interpretation is best characterized not as a variant of the conventionalist interpretation, but rather an early form of the dynamical interpretation; (II) Reichenbach offers a more robust version of the dynamical interpretation than contemporary accounts. On this basis, the paper argues that Reichenbach's approach provides the conceptual resources to (I) strengthen the dynamical approach against common criticisms from defenders of the geometrical approach, (II) expose on its true weak point of both approaches. Unlike the dynamical approach, special relativity does not require a *specific* theory of matter to explain ether drift experiments; rather, it demands that *any* such theory be Lorentz invariant. Unlike the geometrical approach, Minkowski 's formalism helps test this requirement but lacks explanatory power. The paper concludes that, following Lange, special relativity provides an 'explanation by constraint.'

Keywords: Hans Reichenbach • Lenght Contraction • Special Relativity • Dynamical Relativity • explanation

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