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The Rise and Fall of the Luminiferous Aether: Are We Poised for Another Rise?

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If there is a wave, something material should be "waving." This notion led in to luminiferous medium (aether). Cauchy explained Fresnel's diffraction experiment as the shear waves of his elastic aether. Maxwell added the "displacement current" which resulted into a characteristic speed of propagation identified as the speed of light. In the late 19th century the investigations were predominantly aimed at discovering the medium described by Maxwell equations, but none was found. The nil result of Michelson and Morley experiment was thought to disprove the existence of the aether. The wave equation of electrodynamics was made invariant by changing the time in the moving frame: so-called Lorentz Transformation (LT) which set a new paradigm. LT, however, is not valid in accelerating or deforming coordinate frames. Its consistent application leads to paradoxes. Recently, a truly invariant model of space as a material continuum (metacontinuum) has been proposed whose corollary are the Maxwell equations. The charges are shown to undergo Lorentz contraction as moving patterns. Accounting for the motion of the emitting atom relative to the metacontinuum, explains the Ives–Stilwell experiment without time dilation. Thus, the stage is set for a new look into the absolute medium.