

Translation into English: [Chapter 2 - Catalogue of Errors for Both Theories of Relativity](#)

from the German documentation of G.O. Mueller

"On the Absolute Magnitude of the Special Theory of Relativity - A Documentary Thought Experiment on 95 Years of Criticism (1908-2003) with Proof of 3789 Critical Works" - Text Version 2.1 - June 2004
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E: Motion / Error No. 5

The Ehrenfest paradox: a rotating, round disc is said to suffer length contraction on its circumference, relative to the observer

Report in keeping with Galeczki / Marquardt (1997, pp 105-108). The relationship of circumference to diameter is said to be smaller than Pi, due to the Lorentz contraction. Phipps, 1980, analysed 6 different published, suggested solutions. Weinstein, 1971, suggested an experiment that Phipps conducted in 1974. The alleged Lorentz contraction of the disc must have the effect, on a radial, straight line engraved "on the surface of the disc, that it will undergo backwards curvature, i.e. against the direction of rotation". The effect must become increasingly noticeable with an increasing rate of rotation, in other words it must be cumulative. "Phipps carried out this experiment [1974] in that he rotated a high-grade steel disc (diameter: 1.35 cm) 4 months long (!), uninterrupted, using a small compressed-air turbine at 6072 Hz. Several radial lines were engraved on the surface of the disc. During the rotations photos were taken using laser flashes with a duration of 20 ns. The analysis, both during and after the experiment, gave $[\alpha] < 0.0006$, or in other words, a null effect." (p. 107).

Other authors such as Swann [1920] declare the STR as having no authorization for rotational effects, i.e. no predictions and no confirmations. For rotation, there is no theory. The Ehrenfest paradox is thus a true theoretical error.

Galeczki/Marquardt (1997, pp 105-108) add: "Needless to say, all of the textbooks and monographs on the STR steer clear of the Phipps experiment. What else could one expect? Even an extensive original work on relativity and rotation, 'Relativität und Rotation' [P. F. Browne, 1977], in which Weinstein's proposal is mentioned, ignores its experimental realization by Phipps."

Ehrenfest, Paul: Gleichförmige Rotation starrer Körper und Relativitätstheorie. In: Physikalische Zeitschrift. 10.1909, p. 918.
- Swann, William Francis Gray: Unipolar induction. In: Physical review. Ser. 2, Vol. 15. 1920, pp 365-398. - Weinstein, D. H.: Ehrenfest's paradox. In: Nature. London. Vol. 232. 1971, p. 548. - Browne, Peter F.: Relativity of rotation. In: Journal of physics. A: Math. Gen. 10. 1977, p. 727. - Phipps, Thomas E., jr.: Do metric standards contract? In: Foundations of physics. 10. 1980, pp 289-307. - Galeczki / Marquardt: Requiem für die Spezielle Relativität / Georg Galeczki, Peter Marquardt. Frankfurt a. M.: Haag u. Herchen, 1997. 271 pages.