

MP 11: Poster (permanent Di-Do)

Zeit: Dienstag 9:30–18:00

Raum: VMP6 HS B

MP 11.1 Di 9:30 VMP6 HS B

Special Relativity without time delay and without length contraction. — ●OSVALDO DOMANN — Stephanstr. 42, D- 85077 Manching

SR as derived by Einstein is the product of an approach of 1905 when the quantized nature of matter was still not accepted by everybody (God doesn't throw dice). It is a rough undifferentiating approach which omits the origin of the constancy of light speed in inertial frames, arriving to wondrous results about time and space. With the findings made during the last 100 years by experimentalists, an update of Einstein's theoretical approach is more than overdue. Based on these findings, a new theoretical approach is presented taking into consideration that the constancy of light speed in inertial frames is due to the emission of light with light speed 'c' relative to its source, which includes also refracted and reflected light in a medium with index $n=1$. The results are transformation rules without time and space distortions and a consistent theory without paradoxes. GR is the theory of gravitation of the SM and is based on time and space distortions, consequently a revision is also needed. A theory for gravitation without paradoxes based on the reintegration of migrated electrons and protons to their nuclei was derived. More at www.odomann.com

MP 11.2 Di 9:30 VMP6 HS B

Quasiclassical propagator of a relativistic particle via the path-dependent gauge potential — ●ENDERALP YAKABOYLU, KAREN Z. HATSAGORTSYAN, and CHRISTOPH H. KEITEL — Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg, Germany

The proper time formalism for a particle propagator in an external electromagnetic field is combined with the path-dependent formulation of gauge theory to simplify the quasiclassical propagator of a relativistic

particle. The latter is achieved due to a specific choice of gauge corresponding to the use of the classical path in the path-dependent formulation of gauge theory, which leads to cancellation of the interaction part of the classical action in the Feynman path integral. A simple expression for the quasiclassical propagator is obtained in all cases of the external field when the classical equations of motion in this field are integrable. As an example, simple expressions for the propagators are derived for a spinless charged particle interacting with the following fields: an arbitrary constant and uniform electromagnetic field, an arbitrary plane wave, and finally an arbitrary plane wave combined with an arbitrary constant and uniform electromagnetic field. In all these cases the quasiclassical propagator coincides with the exact result [1].

[1] E. Yakaboylu, K. Z. Hatsagortsyan, and C. H. Keitel, Phys. Rev. A **89**, 032115 (2014).

MP 11.3 Di 9:30 VMP6 HS B

Pointer-based simultaneous measurements of conjugate observables in a thermal environment — ●RAOUL HEESE and MATTHIAS FREYBERGER — Institut für Quantenphysik, Universität Ulm, D-89069 Ulm, Germany

The simultaneous measurement model of Arthurs and Kelly involves two pointer systems, which are coupled to a quantum system to be measured. Originally, the pointers and the system to be measured are completely isolated from their environment. However, a more realistic treatment has to take environmental effects into consideration. We therefore extend the original model by a thermal heat bath using the Caldeira-Leggett approach, which leads to a Brownian motion of the pointer systems and allows us to observe noise, dissipation, and decoherence effects [1]. As a result, we can discuss the uncertainty of quantum measurements and their inherent transition from quantum to classical in a dynamic way.

[1] R. Heese and M. Freyberger, J. Phys. A **48**, 135304 (2015).