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Propagator of a massive charged vector boson in a magnetic field: Ritus eigenfunction method

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Abstract

I will present the calculation of the propagator of a charged vector boson in the presence of an external magnetic field using the Ritus Eigenfunction method. Although this is not a novel result, the methodology used throughout the calculation is relevant in the sense that the calculation is done with a diagonalized equation of motion.

Moreover, I present the path from the propagator in the Ritus Eigenfunction method representation to the propagator in the Schwinger proper time parameter representation highlighting a discrepancy with the result presented in the literature.

Furthermore, as a proof of the advantage that the Ritus Eigenfunction method provides, I derive the Lehmann-Symanzik-Zimmermann (LSZ) reduction formula for massive charged vector boson external states in such a magnetic background, which is a novel result.

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