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Department of Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Asymptotic symmetries in QED and sub-leading soft photon theorem.

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Venue: A-304, TIFR

Symmetry structure of Gauge theories has received significant attention in recent years. In the case of Abelian gauge theories, it was shown by He et al that there exists an infinite number of symmetries parametrized by functions on the conformal sphere whose Ward identities are equivalent to Weinberg soft photon theorem.

In this talk we show that Abelian gauge theories admit yet another infinite dimensional group of symmetries whose Ward identities are equivalent to the sub-leading soft photon theorem. We show that the charges associated to the above class of symmetries are sensitive to certain three point functions of the theory and are corrected by irrelevant operators of specific dimensions. Our analysis shows that the sub-leading soft photon theorem in any tree level scattering amplitude is a statement about Asymptotic symmetries of the S matrix.

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