THE QUANTUM SPACETIME SEMINAR SERIES

Department of Theoretical Physics

Status of Soft Theorem in D=4 (Its application in classical limit and understanding as Ward identity)

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Venue: A-304, TIFR

In recent years we explored the understanding of factorization property of the S-matrix for a theory containing massless particles(photon/graviton) when the energy of external massless particles are small (soft particles). Though the leading factorization is discovered long ago (1965) by Weinberg, it's understanding in the subleading order (not restricted to tree level) was not explored prior to our (with Sen) work due to the infrared divergence of S-matrix in D=4. For loop corrected S-matrix, we found that the subleading soft factorization contains terms logarithmic in soft energy. The classical limit of this logarithmic terms in soft graviton theorem provides a new classical tail memory with the known permanent shift between the mirrors of gravitational wave detector. Currently, we are trying to understand whether this soft factorization can be understood as the Ward identity of any asymptotic symmetry.

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