Poynting's Theorem and Undecidability of The Logic of Causality in Light of EPR Completeness Condition

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ABSTRACT

The most elementary empirical truth associated with any experiment involving light (electromagnetic radiation) propagation is the distinction between the source (region of cause) and the detector (region of effect), i.e. "cause/effect" distinction, based on which one can speak of "distance between source and detector", "propagation from source to detector" and, therefore, "action at a distance", "velocity of propagation". According to EPR's completeness condition (ECC), "cause/effect" distinction should be taken into account in a theory that is supposed to provide explanations for such an experiment, the simplest one being the Hertz experiment. Then, in principle, one can decide whether "cause before effect" or "cause after effect" i.e. the logic of causality remains decidable. I show that, working with Maxwell's equations and "cause/effect" distinction to explain Hertz experiment, Poynting's theorem is unprovable. It is provable if and only if "cause/effect" distinction is erased by choice through an act of free will, but the logic of causality becomes undecidable. The current theoretical foundation behind the hypothesis of 'light propagation' comes into question as theoretical optics is founded upon Maxwell's equations and Poynting's theorem. A revisit to the foundations of electrodynamics, with an emphasis on the interplay among logic, language and operation, seems necessary and motivated.

VENUE

PAMU Seminar Hall
A.N. Kolmogorov Building,
ISI, Kolkata

DATE & TIME

27th July, 2023
03:00 PM

Everyone is invited to attend