Contribution ID: **21** Type: **not specified**

Reality from maximizing overlap in the periodic complex action theory

Thursday, 8 December 2022 14:40 (20 minutes)

We study the periodic complex action theory (CAT) by imposing a periodic condition in the future-included CAT where the time integration is performed from the past to the future, and extend a normalized matrix element of an operator O, which is called the weak value in the real action theory, to another expression. We present two theorems stating that the expression becomes real for O being Hermitian with regard to a modified inner product that makes a given non-normal Hamiltonian H normal. The first theorem holds for a given period t_p in a case where the number of eigenstates having the maximal imaginary part B of the eigenvalues of H is just one, while the second one stands for t_p selected such that the absolute value of the transition amplitude is maximized in a case where $B \leq 0$ and $|B|$ is much smaller than the distances between any two real parts of the eigenvalues of H. The latter proven via a number-theoretical argument suggests that, if our universe is periodic, then even the period could be an adjustment parameter to be determined in the Feynman path integral. This is a variant type of the maximization principle that we previously proposed. This talk is based on the collaboration with Holger Bech Nielsen [Prog. Theor. Exp. Phys. 2022 (9) 091B01] (arXiv:2203.07795 [quant-ph]).

Primary author: Prof. NAGAO, Keiichi (Ibaraki University)

Presenter: Prof. NAGAO, Keiichi (Ibaraki University)

Session Classification: Parallel session B