

MAR11-2010-003558

Abstract for an Invited Paper
for the MAR11 Meeting of
the American Physical Society

Pairwise complementary observables and their mutually unbiased bases

BERGE ENGLERT, National University of Singapore

Pairs of complementary observables (PCO) characterize all quantum degrees of freedom and are central to a technical formulation of Bohr's principle of complementarity. A defining property of such pairs are their mutually unbiased bases (MUB) of eigenstates. MUB have found many applications for tasks in quantum information processing. Maximal sets of PCO and MUB are known, by explicit construction, for degrees of freedom that live in finite-dimensional Hilbert space whose dimension is a power of a prime; continuous sets of MUB are also known for most continuous degrees of freedom. I will review the situation and mention a couple of open problems.