

Weak Mutually Unbiased Bases versus Mutually Unbiased Bases in Terms of T-Designs

Authors : Mohamed Shalaby, Yasser Kamal, Negm Shawky

Abstract : Mutually unbiased bases (MUBs) have an important role in the field of quantum computation and information. A complete set of these bases can be constructed when the system dimension is the power of the prime. Constructing such complete set in composite dimensions is still an open problem. Recently, the concept of weak mutually unbiased bases (WMUBs) in composite dimensions was introduced. A complete set of such bases can be constructed by combining the MUBs in each subsystem. In this paper, we present a comparative study between MUBs and WMUBs in the context of complex projective t-design. Explicit proofs are presented.

Keywords : complex projective t-design, finite quantum systems, mutually unbiased bases, weak mutually unbiased bases

Conference Title : ICQISE 2015 : International Conference on Quantum Information Science and Engineering

Conference Location : Barcelona, Spain

Conference Dates : October 26-27, 2015