

# Entangling transformations in composite finite quantum systems

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## Abstract

Phase space methods are applied in the context of finite quantum systems. 'Galois quantum systems' (with dimension which is a power of a prime number) are considered, and symplectic  $Sp(2, \mathcal{Z}(d))$  transformations are studied. Composite systems comprised of two finite quantum systems are also considered. Symplectic  $Sp(4, \mathcal{Z}(d))$  transformations are classified into local and entangling ones and the necessary matrices which perform such transformations are calculated numerically.