Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Proof of Monogamy of non-local correlations in three and four qubit states[1] SANTOSH SHELLY SHARMA, Departamento de Fisica, Universidade Estadual de Londrina, Londrina PR Brazil, NARESH KUMAR SHARMA, Departamento de Matematica, Universidade Estadual de Londrina, Londrina PR Brazil — Recently, we used the process of selective construction of invariants to obtain physically meaningful polynomial invariants for three and four qubit pure states. In this article, we report the exact relations between the concurrence of a two qubit reduced state and corresponding three or four qubit pure state invariants. Firstly, we obtain an analytical expression for concurrence of a given mixed state of two qubits in terms of determinants of negativity fonts in the three or four qubit pure state. For three qubits, a comparison with three tangle and squared negativity expressed in terms of determinants of negativity fonts leads to three relations. These three conditions satisfied by the two-way and three-way correlations sum together and lead to well known CKW inequality. When a qubit pair is part of a four qubit pure state, it may be entangled to the rest of the system through two-way, three-way and four-way correlations. Monogamy equalities, satisfied by two-way, three-way and four-way non-local quantum correlatios are presented for states belonging to classes of four qubit pure states with distinct entanglement types.

[1]We gratefully acknowledge financial support from CNPq and Capes Brazil.

Santosh Shelly Sharma
Departamento de Fisica, Universidade Estadual de Londrina,
Londrina PR Brazil

Date submitted: 14 Nov 2014 Electronic form version 1.4