

# SAIP 2011



Contribution ID : 247

## **Many-boson Quantum Walks on Graphs with Shared Coins**

Wednesday 13 Jul 2011 at 12:30 (00h15')

### **Content :**

Quantum walks of particles obeying bose statistics are introduced. In such a quantum walks the conditional shift operation is performed with the single coin tossing for the whole lattice. An explicit form for the transition probabilities in a single step is derived. This allow to describe the evolution of an arbitrary state and an arbitrary number of steps. This model easily embrace the concepts such as the join probability, the counting statistics and the high order correlations. It also presents the computational challenges arising from the exponential increase in the number of basis states entering into the lattice state as a function of the number quantum walkers and the number of steps. Possible solutions are proposed in some applications of the model to quantum walks on finite graphs.

### **Level (Hons, MSc, PhD, other)? :**

PhD

### **Consider for a student award (Yes / No)? :**

yes

### **Short Paper :**

yes

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**Track classification :** Track G - Theoretical and Computational Physics

**Type :** Oral Presentation