Classical and quantum walks: similarities and differences with emphasis on recurrence properties

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Abstract

I will revisit the (super classical) notion of recurrence and expected return time for an example of a classical walk and then define these notions for (unitary) quantum walks. We will see how very classical pieces of analysis developed for different purposes around 1900-1920 give a good way to study these properties in the quantum case. Among the main characters of the story are Polya, Riesz and Schur. There are still lots of open questions, some surprises and even some physics experiments trying to test some of the predictions of the theory.

Organizer(s): Pranjal Awasthi and Shubhangi Saraf