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## Introduction to the quantum first detection problem

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We consider quantum dynamics on a graph, with repeated strong measurements performed locally at a fixed time interval  $\tau$ . For example a particle starting on node  $x$  and measurements performed on another node  $x'$ . From the basic postulates of quantum mechanics the string of measurements yields a sequence no,no,no,  $\dots$  and finally in the  $n$ -th attempt a yes, i.e. the particle is detected. Statistics of the first detection time  $n\tau$  are investigated, and compared with the corresponding classical first passage problem. Dark states, Zeno physics, a quantum renewal equation, winding number for the first return problem (work of A. Grunbaum et al.), total detection probability, detection time operators and time wave functions are discussed.

### Summary

**Primary author(s)** : Prof. BARKAI, Eli (Bar-Ilan University)

**Presenter(s)** : Prof. BARKAI, Eli (Bar-Ilan University)

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