On a problem in quantum control with unknown initial conditions

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We consider the problem of controlling solutions of the linear Schroedinger equation using linear lasers. The initial condition is not exactly known, but it is known that it can be generated within a range of initial conditions. Is it possible to construct a laser that drives all these initial conditions to a detectable wave? We formulate the problem mathematically and discuss a numerical method to approximate the laser. This problem is relevant in the experimental physics setting to detect whether antimatter is subject to the same gravitational force as matter or not.

Joint work with Jan Petter Hansen (University of Bergen).