

CSU PHYSICS COLLOQUIUM

“Instantaneous Time Mirrors and Time Reversal”

Olivier Pinaud

Colorado State University

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120 Engineering (Hammond Auditorium)

Abstract

Instantaneous time mirrors (ITMs) were recently introduced by M. Fink and collaborators as a new avenue for time reversal. The latter allows for the focusing of waves, whether acoustic, electromagnetic or elastic, and has found many important applications in medical imaging, non-destructive testing, and telecommunications for instance. The main practical difficulty of standard time reversal is the recording/reversal process which necessitates a quite complex apparatus. ITMs offer on the contrary a simplified experimental alternative that does not require any measurements, provided there is some control over the medium of propagation. We will review in this talk the basics of the time reversal of waves introduced in the nineties, and discuss the ITMs and some of their properties. In addition to the experimental setup proposed by M. Fink et al, we will describe another physical realizable system based on surface plasmons.

Biography

Olivier Pinaud is a professor in the department of mathematics at CSU. He is interested in applied math, in particular in partial differential equations, inverse problems, and quantum sciences. He is the recipient of an NSF CAREER award.