

ACOUSTICS2008/885 **an overview of time-reversal acoustics**

Mathias Fink

Laboratoire Ondes et Acoustique, ESPCI, Université Paris 7, CNRS, 10 rue Vauquelin, 75005 Paris, France

Time-reversal invariance is a very powerful concept in physics. In the field of acoustics where time reversal invariance occurs, time-reversal experiments may be achieved simply with arrays of transmit-receive transducers, allowing an incident wave field to be sampled, recorded, time-reversed and re-emitted. Time reversal mirrors (TRMs) may be used to study random media and chaotic reverberating structures. Common to these complex media is a remarkable robustness exemplified by observations that the more complex the medium between the probe source and the TRM, the sharper the focus. TRMs open the way to new signal processings that interest imaging, detection, telecommunications and therapy. Time reversal mirrors have plenty of applications including ultrasonic therapy and medical imaging, non destructive testing, telecommunications, underwater acoustics, seismology, sound control, home automation. An overview of these fields will be presented.