

## APPLICATIONS

### On-line inspection and Quality Control

When propagating through a specimen, the ultrasonic waves carry information about the inner structure. Similarly, when propagating along a surface, the information about the surface quality and surface coatings can be extracted.

### Thickness measurement

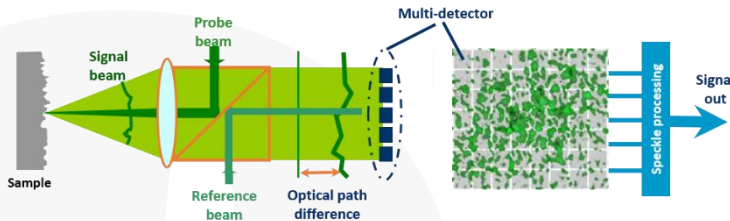
If the sonic velocity of the material is known, it is possible to measure the thickness of the specimen. Using a pulse-echo configuration (detection and generation on same side and superimposed), with the velocity of sound  $c$  and the time  $t$  between two peaks, the distance  $d$  in the material can be calculated.

## TECHNOLOGY

The **Quartet** was born from a research and development grant from NASA and the National Science Foundation.



The receiver combines the advantages of homodyne interferometry with the benefits of multi-detector technology. The beam reflected by the sample's rough surface is comprised of many speckles. The multi-speckled signal beam is combined with the reference beam and focused on 50 photo-detectors. Each detector collects a few speckles and delivers a homodyne signal.












Each homodyne signal is processed in parallel using a patented signal processing architecture. The signal processing is based on a "random quadrature" demodulation scheme which takes advantage of the random phase distribution inherent to speckle light. The detectors produce a time-varying analog voltage that is proportional to the rectified instantaneous surface displacement at ultrasonic frequencies.

## FEATURES

- > Can be fitted with lasers ranging from visible to IR
- > Fiberized
- > Inspection on rapidly moving object
- > High sensitivity on all surface types and materials
- > Continuous, modulated or long pulse detection laser

## SPECIFICATIONS

 <p>Technology Multi Channel Random Quadrature</p>	 <p>Detection Out-Of-Plane</p>	 <p>Configuration Optical Fiber</p>
 <p>Internal Laser power Up to 3W All Wavelength</p>	 <p>NESD (out-of-plane motion) <math>1.10 \frac{\mu\text{m}}{\text{Hz}}^{1/2}</math></p>	 <p>Detection bandwidth Up to 100MHz</p>
 <p>Dimensions 381 x 381 x 152 mm<sup>3</sup></p>	 <p>Weight 15kg</p>	 <p>Electrical requirements 110V / 220V 50Hz / 60Hz</p>