Y. Okabe LAB.

[Structural Health Diagnostic Systems]

Department of Mechanical and Biofunctional Systems

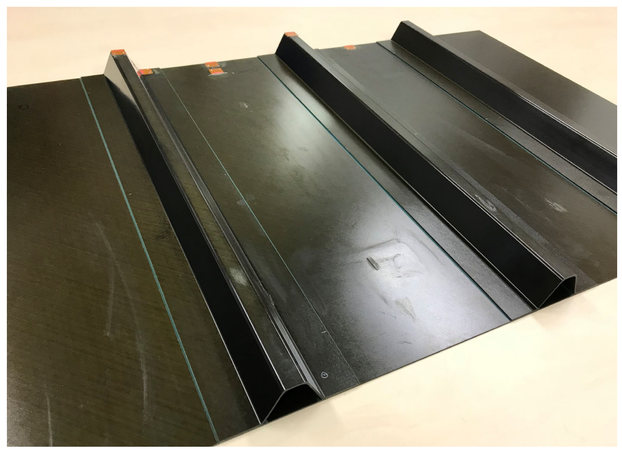
Structural Health Diagnostics

Department of Systems Innovation, School of Engineering

http://www.okabeylab.iis.u-tokyo.ac.jp/

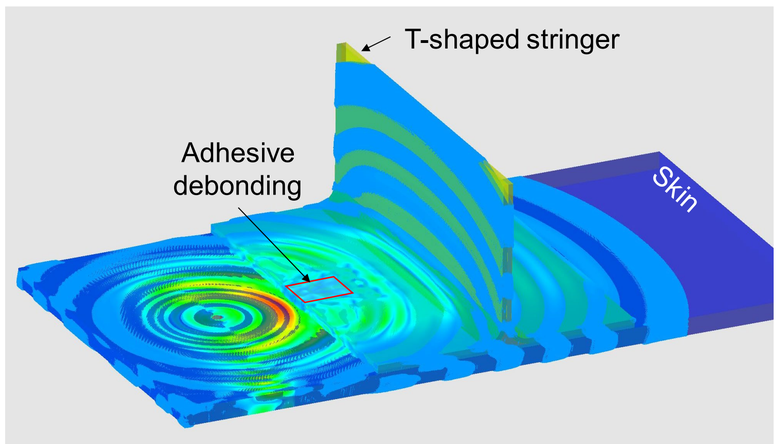
Lightweight composite structures have been applied to airplanes and automobiles. For the health diagnostics of the structures, we are developing structural health monitoring systems with optical fiber ultrasonic sensors and non-destructive inspection techniques using laser ultrasonics. In addition, we are attempting to construct an inspection system applicable to extreme environments.

Lightweight Composite Structures

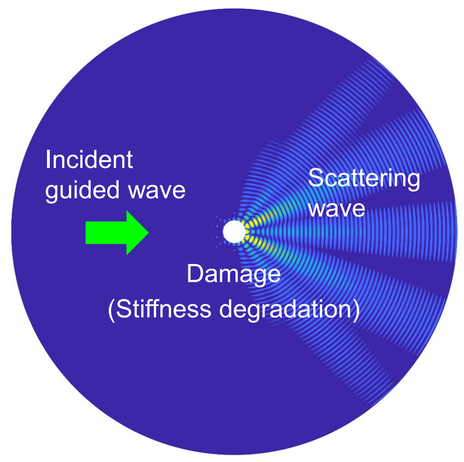


CFRP stiffened panel

Structural Health Monitoring Using Guided Waves



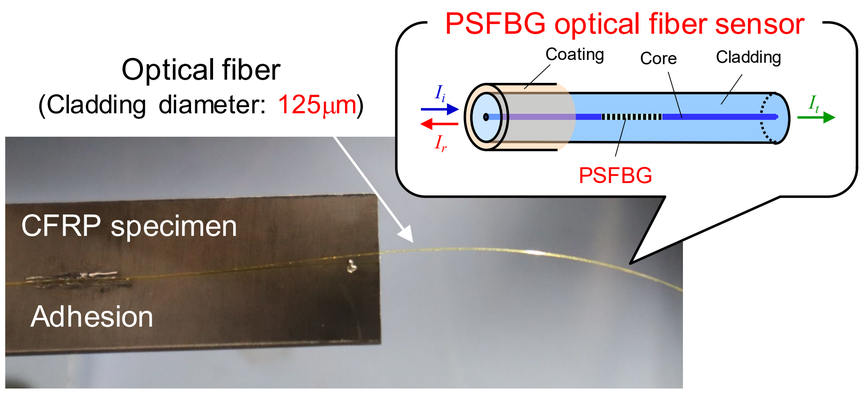
Detection of debonding damage in a CFRP skin/stringer bonded structure



Calculation of scattering wave at an impact damage in CFRP based on thin plate theory

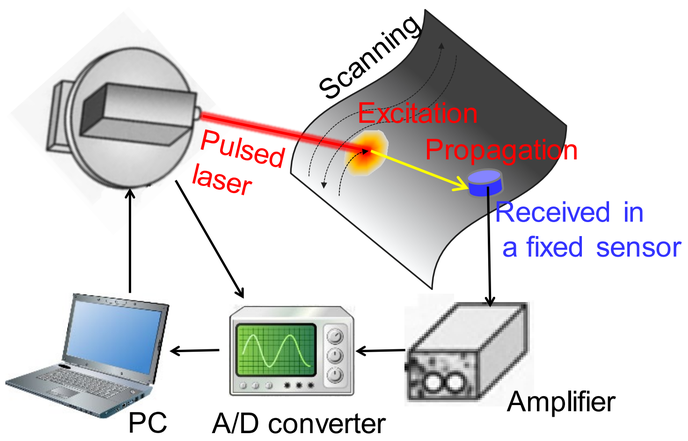
Non-destructive Inspection System Applicable to Extreme Environments

Optical Fiber Sensor (Ultrasonic Receiving)

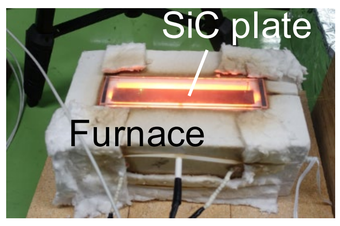


Optical fiber ultrasonic sensor achieving remote AE measurement

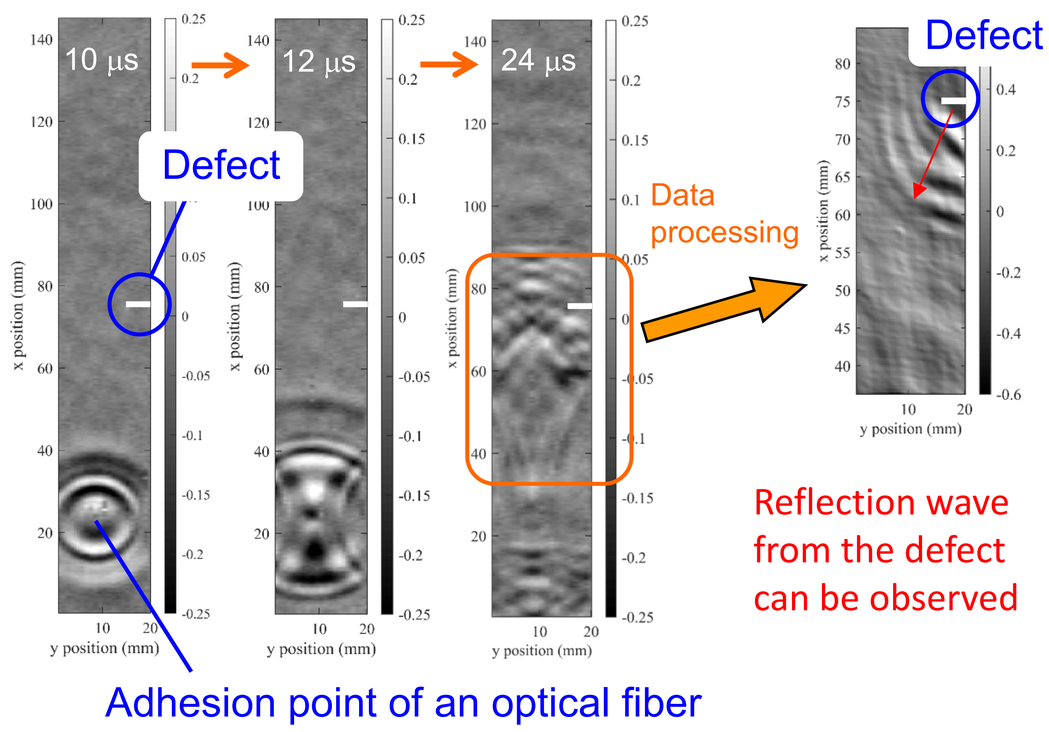
Laser Ultrasonics (Ultrasonic Excitaion)



Laser ultrasonic visualizing inspector
(LUVI-CP, Tsukuba Technology Co., Ltd.)



Ultrasonic inspection was conducted to a ceramic plate heated up to 1000 °C



Reflection wave from the defect can be observed

Even at high temperature of 1000 °C, ultrasonic propagation behaviors can be visualized, which enables the observation of reflection waves from defects