Birth and death of materials - Inspection of materials without contact: interests of Infrared Thermography

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www.france.no/if/oslo/sciences/
How human « see » heat

• **Visible spectra for human eye**

  ![Visible Spectrum Diagram](image)

  - **Increasing Frequency (ν)**
  - **Increasing Wavelength (λ)**

• **Infrared radiation** (skin yes! but not much)
Infrared thermography

- Optical measurement
- IR sensors for “low” temperatures

- Interests:
  - Ability to capture information not accessible to human eye
  - Without contact
  - Quickly
  - In a quite easy way
Infrared thermography

- **Applications:** civil engineering, military, security, marine, medicine, industry
Materials inspection

- Transport industry (aviation, automotive, spatial, marine)
- Principle:
  - disturb and look at consequences!
  - 2 ways

1/ Heating-Lighting (Non Destructive Testing)
2/ Mechanical load (Damage monitoring)

- In order to reveal internal defects and damage processes
1/ Non Destructive Testing

- Analysis of bonded repaired composites (Barus Ph.D. 2016)
1/ Non Destructive Testing

Repaired specimen
Insulating material
Handling points

GOOD

NOT SO GOOD!
2/ Damage monitoring

- Structural performance of carbon-epoxy composites (Goidescu Ph.D. 2011)
2/ Damage monitoring
2/ Damage monitoring
We all shine in IR!

Thank you for your attention

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