

A REAL-TIME MICROWAVE CAMERA at 24 GHz (K-Band)



M. T. Ghasr, M. A. Baumgartner, D. Clark, S. Kharkovsky, M. Abou-Khousa, and R. Zoughi

Applied Microwave Nondestructive Testing Laboratory (*amntl*)

Electrical and Computer Engineering Department

Missouri University of Science and Technology (Missouri S&T), Rolla, MO 65409

Objective

- Design and build a *real-time* microwave imaging system (i.e., camera)

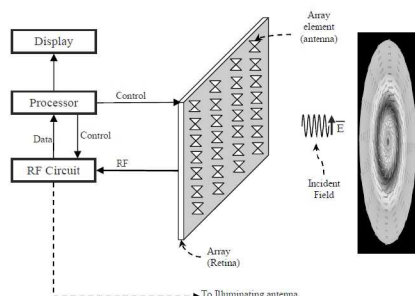
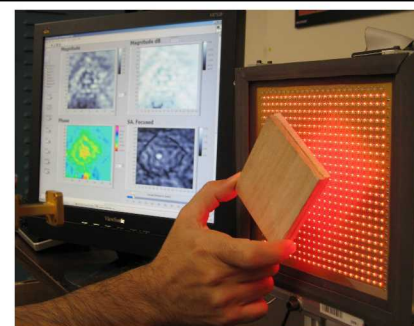
Overview

- Microwave imaging offers tremendous potential in many applications:
 - Inspection of low-loss composites, radomes, etc.
 - Detection and evaluation of corrosion under paint
 - Medical imaging
 - Security, contraband detection
- Raster scanning is slow and requires bulky mechanical systems
- A *real-time* and *portable* imaging system can be extremely useful for rapid nondestructive testing of large structures



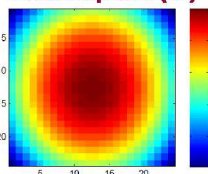
Specification

- Aperture Size: 6" × 6"
- Spatial Resolution : ~0.25"
- Coherent E-Field measurement
- Frequency: 24 GHz
- Dynamic range: 70 dB
- Frame rate: 30 fps
- Real-time focusing

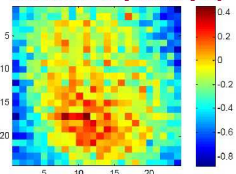


Electric Field Mapping

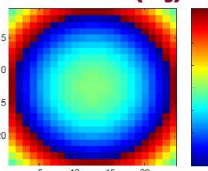
Actual Amplitude (dB)



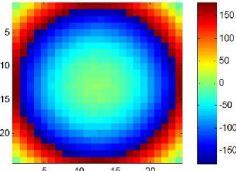
Measured Amplitude (dB)



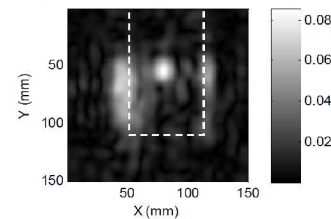
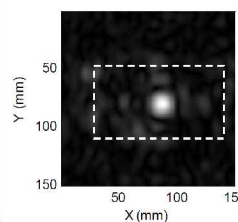
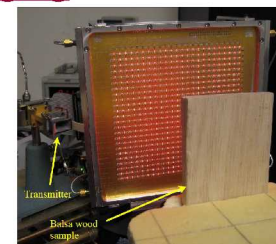
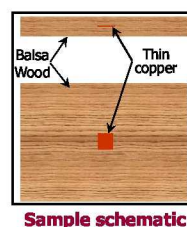
Actual Phase (deg)



Measured Phase (deg)



Imaging



Demonstration

See the operation of this imaging system being demonstrated in conjunction with this poster presentation.

Acknowledgment

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