



## Institute of Electromagnetics and Acoustics, Xiamen University

### Overview

Established in 2011, IEMA focuses on studying electromagnetics, acoustics, coupling of multi-physics fields and their applications in major engineering fields.

### Location

Xiamen University Haiyun Campus  
Zengcuo'an West Road, Siming District, Xiamen, Fujian Province

### Contact

E-mail: iema@xmu.edu.cn  
Telephone: 0592-2182456  
Fax: 0592-2182456

### Recent Research

- Detection and imaging by using electromagnetic waves**  
 A set of practical ATEM system prototypes used for detection has been completed.  
 Making contribution to the high-resolution moon-structured imaging radar on the Chang'e 5 lunar probe.
- Metamaterials and transformation optics**  
 A device of conformal transformation optics has been designed for demonstrating its self-focusing property for geometry optics and Talbot effect for wave optics.  
 Perfect invisibility has been achieved by using geodesic conformal mapping and Fabry-Pérot resonances for electromagnetic waves, acoustic waves, and surface water waves.
- Antenna and microwave technology**  
 A near field wireless communication system has been studied, which uses large array antenna and works in its near-field range to achieve stable wireless communication service with high rate and wide range.  
 Large-bandwidth, high-efficiency and high-gain antenna working at millimeter wave band and THz wave band has been realized.
- Bioelectromagnetics**



Using physical stimulation, a technique has been developed for the treatment of cranial nerve disease and cancer.

A method based on electromagnetic field inversion imaging technique has been proposed to realize effective detection and location of pathological tissue.

- Nanometer photoelectron technique**

A simple and cost-effective method based on soft ultraviolet nanoimprint lithography has been used to fabricate wafer-scale uniform plasmonic nanocave arrays for visible light sensors with high performance.

- Energy exploration by using acoustic wave**

For obtaining accurate information of gas and oil, a new and rapid method based on seismic-electromagnetic full waveform inversion has been developed.

- Plasma**

The validity of using the molecular probe method to estimate the  $[\text{OH}_{\text{dis}}]$  in the plasma-liquid system has been investigated.

A derivative absorption spectroscopic method has been used to in situ simultaneously trace and quantify the aqueous peroxide ( $\text{H}_2\text{O}_2$ ), nitrate ( $\text{NO}_3^-$ ), and nitrite ( $\text{NO}_2^-$ ) generated during the plasma-liquid interactions.

For more details, please see: <http://ema.xmu.edu.cn>