A Terahertz (THz) Near-field Scanning System

Student: Wong Chun Kit
Programme: BENG-ECE
Supervisor: Prof. Chan Chi Hou

Overview
- **Scenario:** Antenna and probe designs for THz communications, imaging and sensing applications
- **Problems:**
  - Wavelength of THz is relatively short
  - High precision is required
  - Costly commercial systems
- **Objective:** Build a low-cost near-field scanning system in THz band to provide near-field measurement and far-field pattern computation capabilities

Methodology
- Automatic probe alignment by detecting the phase of antenna under test (not available in commercial system)

Near-field phase detection

Far-field pattern with probe compensation

Difficulties
- Hardware assembly & software design
- **Challenges:**
  1. High precision in probe alignment
  2. Probe compensation in far-field calculation

Experimental Validation

Probe alignment using laser in MMW band