

## **Abstract:**

The recent approval granted by 'Federal Communication Commission (FCC)' to use 24-GHz microwave-sensors to manufacture short-range automobile collision avoidance radars have initiated a new wave of research work in this field. In addition, this new generation of low-cost, miniaturized and robust non-contact ISM band sensor is also being investigated for millimeter-wave imaging system for security and commercial application. In Saudi Arabia, this class of antennas have potential application in the process-control-mechanism used in petrochemical industries, to monitor the petroleum and water ration within the transporting pipelines and the storages dumps.

Active array-antenna modules, located in the front-end of the microwave-sensor, are often used to enhance the performance of the device. In this project, a 24-GHz microstrip linear phased array antenna with beam-scanning and signal-amplification properties will be designed. Professional softwares like 'High frequency Structural Simulator' and "Advanced Design System" may be used to simulate, analyze and optimize the active antenna-array module. Low cost packaging techniques for the 24-GHz microwave antenna array will also be envisaged.