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## **Microwave Engineering**

### **Title of the Activity:**

Concept of Power Distribution of Electromagnetic Waves (EM Wave) when directional Coupler is used as a power splitter.

### **Methodology:**

Students grouped to form a 4 ports directional coupler.

### **Procedure of conducting the activity**

A Group of Students is taken of ECE 3<sup>rd</sup> year for this activity in microwave lab. The motive of this activity is to understand that, how the distribution of electromagnetic wave through a directional coupler which is a 4 port device takes place.

A chain of students is made and considered as the electromagnetic wave which entered at port 1 and distributed in 2 parts through port 2 and port 4 in such a way that major portion of the power goes through the port 2 and rest through port 4 as it is done practically with the help of microwave bench set- up.

### **Theory related to the topic:**

A directional coupler has four ports, where one is regarded as the input, one is regarded as the "through" port (where most of the incident signal exits), one is regarded as the "coupled" port (where a fixed fraction of the input signal appears, usually expressed in dB), and one is regarded as the "isolated" port, which is usually terminated.

Power dividers (also power splitters and, when used in reverse, power combiners) and directional couplers are passive devices used mostly in the field of radio technology.

### **Procedures:**

1. A group of 20 students form a Directional coupler..
2. Students are made to stand in such a way to form four port of directional coupler.
3. Students are arranged to form a train of electromagnetic pulse.
4. In free space the wave is transmitted.
5. A student is placed at the opening of the port 3 so as to isolate it.
6. There is a small opening at port 4 so students can pass through mainly from port 2 and rest through port 4.