

Applications of Microwaves for Common Man

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The Microwave frequency range 3GHz-30GHz is part of Electro-magnetic spectrum that covers from Hertz to Terahertz. This part of spectrum is utilized for different applications that include Communication, Remote Sensing, Industrial, Medical and Planetary Exploration.

The Radio frequencies can be used for generation of information in Day as well as in Night. They can penetrate clouds and so one can use these frequencies during rain and thus they have capability of providing information in All types of Weather. The Microwaves are sensitive to Soil Moisture and so one can estimate Soil Moisture using Microwave Sensors. They can penetrate Vegetation and so one can get information about soil below vegetation. One can use Microwaves for Study of Health of Vegetation. The Microwaves can penetrate Soil upto certain depth depending on frequency and so one can detect presence of Material using Microwave Sensors. The Microwaves can be used for detection of Adulteration in Liquid, Powder. They can also be used for detection of defects in vegetables and fruits.

The area of Communication like wireless communication, Direct broadcast satellites, which broadcast television and radio directly into homes. The use of Microwaves in telecommunication area like data transfer, long distance communication, makes life easier and more faster. The new emerging technologies like 5G and in future 6G technologies will be there to provide more benefits to the common man.

In case of Biomedical Applications the Microwaves provide Detection of Maladies and also help in curing them. The areas covered are, Diathermy, Detection of Cancer, Cure of Cancer, Treatment of Hospital waste, Therapeutic Applications based on local Heating, Prostate, Hyperplasia, Heart and other tissue Ablation and Angioplasty, Monitoring of FROZEN organs and re-warming Infants after

Hypothermia as well as Detection and Monitoring of Inflammation etc.

These all applications of Microwaves are unique capabilities of this part of spectrum. Basically the main role of the Microwave is to serve the last person of the Societies like: Determination of Soil Moisture is fruitful for farmers, Determination of Ocean salinity will help the fishermen, study of monsoon, natural disasters like tsunami, hurricanes and Snow studies will help to detect the change in the climate and help in study of the Himalayan ice.

This is a New Area of Emerging Applications of the Technology that was brought to Humanity by Sir J. C. Bose when He generated Millimetre waves (5 mm) in Presidency College Calcutta in 1894/95. Today our Generation is utilising this Technology for serving the Humanity.

I am extremely happy that I got this opportunity of introducing this subject of Microwave Applications for utilization for the common man of the society.

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