A SEMINAR PRESENTATION ON PLASMA ANTENNA

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INTRODUCTION

WHAT IS PLASMA ?

On earth we live upon an island of "ordinary" matter. The different states of matter generally found on earth are solid, liquid, and gas. Sir William Crookes, an English physicist identified a fourth state of matter, now called plasma, in 1879.

Plasma is by far the most common form of matter.

Plasma in the stars and in the tenuous space between them makes up over 99% of the visible universe and perhaps most of that which is not visible.

Important to ASI's technology, plasmas are conductive assemblies of charged and neutral particles and fields that exhibit collective effects. Plasmas carry electrical currents and generate magnetic fields.

PLASMA ANTENNA TECHNOLOGY

Plasma antenna technology employs ionized gas enclosed in a tube (or other enclosure) as the conducting element of an antenna. This is a fundamental change from traditional antenna design that generally employs solid metal wires as the conducting element.

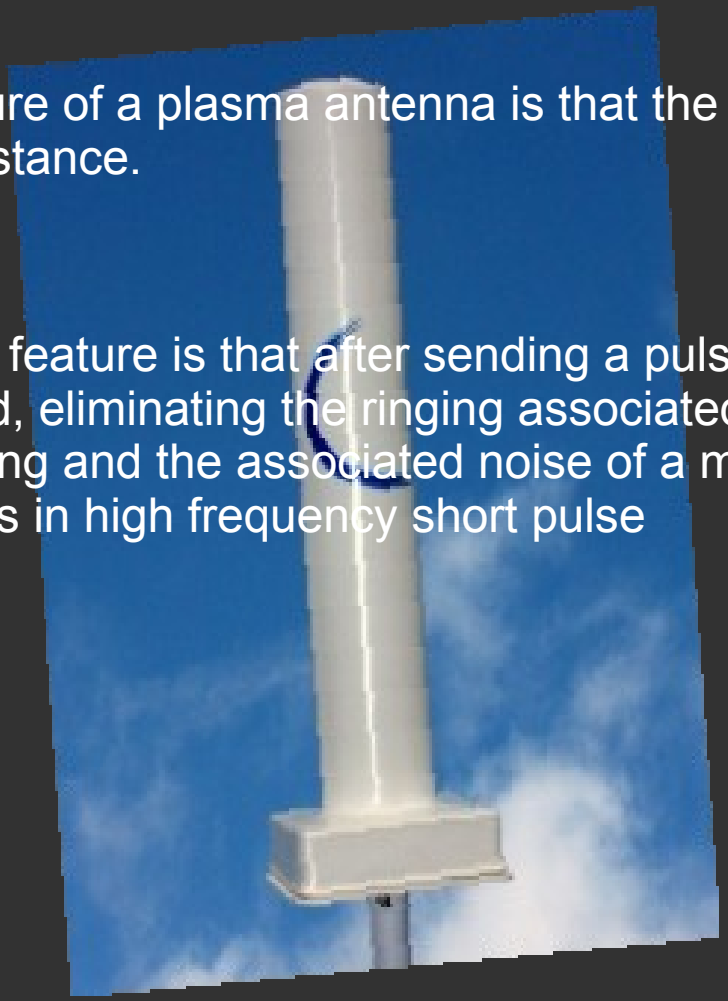
Ionized gas is an efficient conducting element with a number of important advantages. Since the gas is ionized only for the time of transmission or reception," ringing" and associated effects of solid wire antenna design are eliminated.

The design allows for extremely short pulses, important to many forms of digital communication and radars.

UNIQUE FEATURE OF PLASMA ANTENNA

- One fundamental distinguishing feature of a plasma antenna is that the gas ionizing process can manipulate resistance.

- A second fundamental distinguishing feature is that after sending a pulse the plasma antenna can be deionized, eliminating the ringing associated with traditional metal elements. Ringing and the associated noise of a metal antenna can severely limit capabilities in high frequency short pulse transmissions.



SelectaBeam SC-750 Series

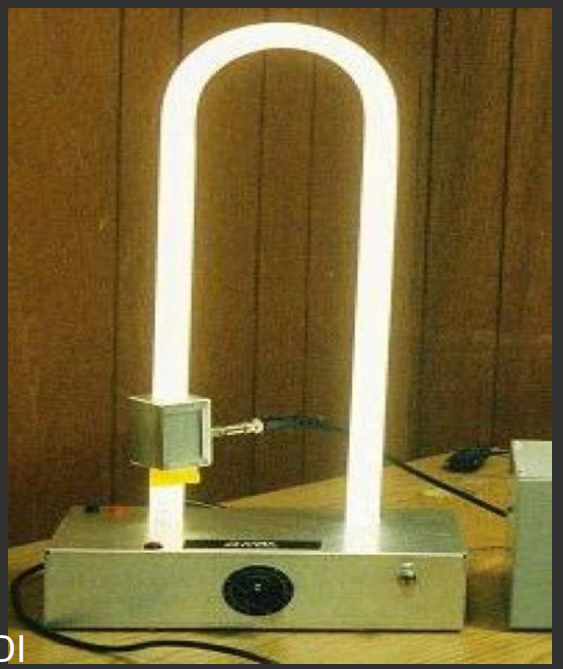
Key Features

- **High directional gain:** concentrates RF power to increase link budget, dramatically enhancing network coverage and capacity.
- **Low sidelobes** reduce interference, enabling improved frequency re-use and substantially higher utilization.
- **Wide bandwidth** supports simultaneous multi-band or UWB operation from a single compact antenna.
- **High speed beam** switching enables spatial time division multiplexing to boost spectral efficiency and throughput.
- **Compact and lightweight** form factor reduces site and mast costs, simplifies installation and minimizes environmental impact.
- **Maintenance free** - auto-aligning with no moving parts and requires no calibration, minimizing total cost.

TRADITIONAL ANTENNA VS PLASMA ANTENNA

- Unlike simple directional antennas, Plasma Antennas' selectable multi-beam antennas are electronically steered, avoiding the need for manual or mechanical alignment and realignment of fixed point-to-point communication links. Plasma Antennas' selectable multi-beam antennas provide similar advantages to phased array antennas but at a fraction of the cost, together with much wider bandwidth of operation.

VS



APPLICATIONS

- **Network Equipment Providers and Systems Integrators**
- **Network Operators**
- **Public Safety Networks**
- **Sensing**
- **Defense, Space and Homeland Security.**

ADVANTAGES

Key Features:

High gain:

Low interference:

Wide bandwidth:

Low latency:

Affordable:

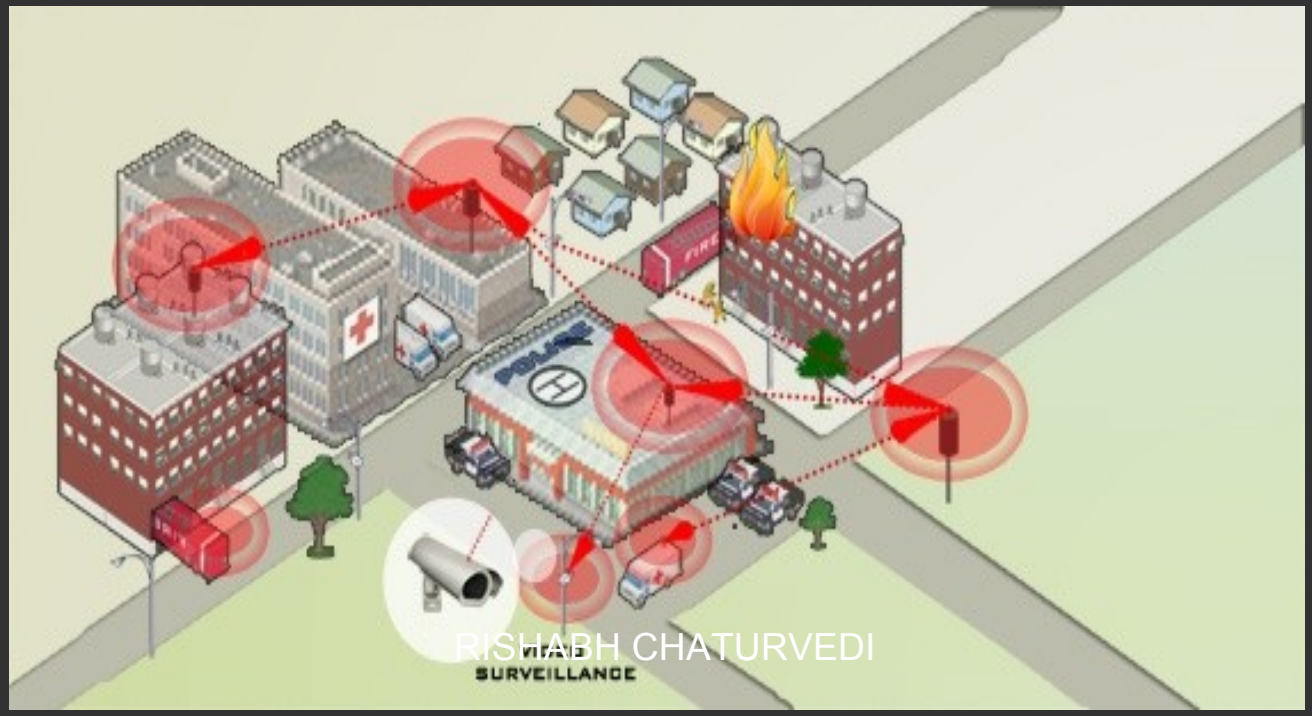
Compact and lightweight:

Maintenance free:

Modular:

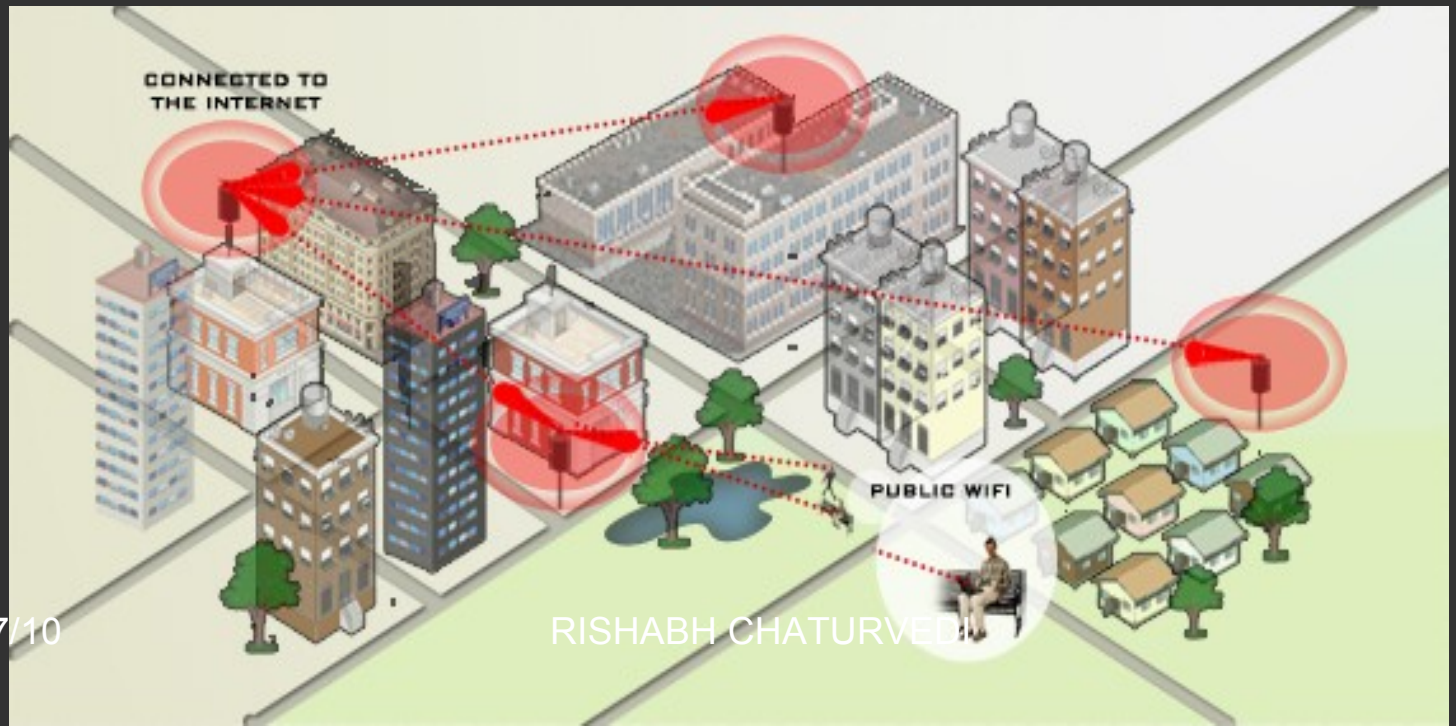
Microwave Communication

Directional antennas have been the mainstay of microwave communications. Fixed directional antennas require manual alignment on installation and realignment in the case drift or relocation of either end of the link. Expensive site visits by service personnel drive up costs for the network owner. Mechanically steered antennas are too costly for most fixed applications. In nomadic scenarios, mechanical steering is deployed to ease realignment of large, long range directional antennas.



WiFi-WiMAX Local Access Point

Plasma Antennas' SelectaBeam SC-750 Series of selectable multi-beam antennas combine an optional omnidirectional mode operating at one frequency band, with directional beamforming at another frequency. This powerful dual-band combination provides an efficient and compact 'single-antenna' solution for local WiFi hot-spots within metropolitan or rural area WiMAX network.



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