	Akhil Bharatiya Maratha Shikshan Parishad's Anantrao Pawar College of Engineering & Research	
	Record No.: ACA/D/021 Revision: 00	DoI: 21/01/2019

EVENT REPORT

Name of Event: COEP Expert Lecture of Radiation and Microwave Technique Subject

Date of Event: 30/9/2021

Time of event: 11.30 P.M. To1.30 P.M.

Name of Event Coordinator: 1. Prof. Sharad Jagtap – SPOC, COEP
2. Prof.Vaishali Bhimte – Subject Incharge

Name of Session Expert: Dr. Deeplaxmi Niture

Faculty of COEP, Pune

Brief Introduction of Session Expert: She has received her B. Tech (2003) and M. Tech (2006) in Electronics and Telecommunication Engineering from Dr. Babasaheb Ambedkar Technological University (Dr. B. A. T. U), Lonere, India. She has pursued Ph.D. in Electronics and Telecommunication Engineering from the Savitribai Phule University of Pune, Maharashtra, India in 2021. Presently she is working as assistant professor in College of Engineering Pune. She has a teaching experience of more than 12 years. She has authored several journal and conference papers. Her research interests include Microstrip patch antenna, Ultra-wideband antenna, reconfigurable antenna etc .

Target Audience with count:

Brief Description of Event:

- Introduction of Inaugural Function
- Brief Session Description
- Feedback/ Q-A Session/ Valedictory Function
- Vote of Thanks

COEP Expert Lecture of Radiation and Microwave Technique Subject organized on 30/09/2021 at 11.30 A.M. on the topic 'Transmission Line-General Solution for TE, TM and TEM waves.' The program was introduced by Prof. Vaishali Bhimte briefly. Head of department E&TC Prof. Shailesh Hajare has warmly welcomed session expert on this occasion. Prof. Vaishali Bhimte, has briefly introduced session expert, Dr. Deeplaxmi Niture. She has welcomed all students and staff. After that, session was handover to Session Expert Dr.

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Deeplaxmi Niture. Dr. Deeplaxmi Niture has taken very detailed and interactive session. She has focused Transmission Line-General Solution for TE, TM and TEM waves.

After her session, question answer session was there. Students have asked many questions to her. She answered the questions in very descriptive way. Online Feedback taken from students as session was rea helpful and interactive session. Vote of thanks was given by Prof. Vaishali Bhimte. She has given thanks Session Expert Dr. Deeplaxmi Niture for giving such a nice session to our students and taken out time out of h busy schedule. Also, thanks given to our Management and Principal for giving permission to organize such session. Thanks, given to organizing committee at last. The programme was concluded.

Date:22/10/2021

Prof. Vaishali Bhimte
Event Coordinator

27/10/2021
Prof. Shailesh Hajare
Head of Department

Principal
APCOER

Anantrao Pawar College of Engineering & Research ★ Pune

General Approach to Waveguide Analysis

Using vector triple product identity we can simplify eq. (9)

- $A \times B \times C \times = (A.C)B - (A.B)C$
- $\frac{\partial}{\partial z}\hat{z} \times \frac{\partial}{\partial z}\hat{z} \times \bar{E}_\perp = \frac{\partial}{\partial z}\left(\frac{\partial}{\partial z}\hat{z}.\bar{E}_\perp\right)\hat{z} - \left(\frac{\partial}{\partial z}\hat{z}.\frac{\partial}{\partial z}\hat{z}\right)\bar{E}_\perp = 0 - \frac{\partial^2}{\partial z^2}\bar{E}_\perp$
- $\left(\frac{\partial}{\partial z}\hat{z}\right) \times \nabla_\perp \times (E_z\hat{z}) = \nabla_\perp\left(\frac{\partial}{\partial z}\hat{z}.E_z\hat{z}\right) - \left(\frac{\partial}{\partial z}\hat{z}.\nabla_\perp\right)E_z\hat{z} = \nabla_\perp\left(\frac{\partial E_z}{\partial z}\right) - 0$

Finally eq. (9) will become

- $\left\{\omega^2\mu\varepsilon\bar{E}_\perp + \frac{\partial^2}{\partial z^2}\bar{E}_\perp\right\} = -j\omega\mu\nabla_\perp \times (H_z\hat{z}) + \nabla_\perp\left(\frac{\partial E_z}{\partial z}\right)$ ..... (10)

Substituting $\frac{\partial}{\partial z} \equiv -\gamma$ and $\frac{\partial^2}{\partial z^2} \equiv \gamma^2$ in eq. (10)

- $\{\omega^2\mu\varepsilon + \gamma^2\}\bar{E}_\perp = -j\omega\mu\nabla_\perp \times (H_z\hat{z}) - \gamma\nabla_\perp E_z$ ..... (11)

Let us define

- $\omega^2\mu\varepsilon + \gamma^2 = h^2$

Rectangular Waveguide – TM Mode

Substituting X, Y and Z from Eqs. (27) to (29) in eq. (19)

$$E_z = C_5(C_1 \cos Ax + C_2 \sin Ax)(C_3 \cos By + C_4 \sin By)e^{-j\beta z} \quad \cdots\cdots (30)$$

- The E_z component is parallel to all the four walls of the waveguide. Since the tangential field of the electric field is zero at the conducting boundary, we get the boundary condition for E_z.
- The boundary conditions for $x = 0$ and $y = 0$ walls give $C_1 = 0$, $C_3 = 0$ and the boundary conditions for $x = a$ and $y = b$ give

$$Aa = m\pi \Rightarrow A = \frac{m\pi}{a} \quad \cdots\cdots (31)$$

$$Bb = n\pi \Rightarrow B = \frac{n\pi}{b} \quad \cdots\cdots (32)$$

where m and n are integers.

- Substituting for A and B, we finally get the solution for E_z as

$$E_z = C \sin\left(\frac{m\pi x}{a}\right) \sin\left(\frac{n\pi y}{b}\right) e^{-j\beta z} \quad \cdots\cdots (33)$$

Constant C is essentially a combination of C_2, C_5, C_4 which gives the amplitude of the longitudinal component of the electric field.

Gmail

vaishali bhimte <vaishali.bhimte@abmspcoerpune.org>

Invitation for expert Lecture of Radiation and microwave technique subject as session speaker

vaishali bhimte <vaishali.bhimte@abmspcoerpune.org> Wed, Sep 29, 2021 at 12:40 PM
To: dvn.extc@coep.ac.in
Cc: hod.extc@coep.ac.in, Shailesh Hajare <shailesh.hajare@abmspcoerpune.org>, sharad.jagtap@abmspcoerpune.org

Respected Madam,

We E&TC Department, Anantrao pawar college of engineering and research,Pune invite you for **expert Lecture** of **Radiation and microwave technique** subject on 30/09/2021 as **Session Speaker** at 11.30 A.M.

Following are the details-
Date-30/09/2021
Time-11.30 A.M.
Online Mode-Webex
Topic-Transmission Line-General Solution for TE,TM and TEM waves.

Kindly find the attached invitation letter.

Thanks and Regards,
Prof. Vaishali Bhimte
E&TC Department
APCOER,Pune-09

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