



ESTD : 1946

**The National Institute of Engineering, Mysuru**

***Department of Electronics and Communication***

***Engineering***

**Type of Event:** ONLINE Expert Talk/Webinar

**Event Name:** Recent Advancements in SIW-Based Filtering Antennas

**Academic Year:** 2025-2026

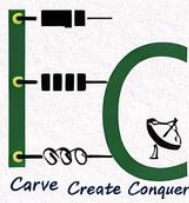
**Date:** 07/02/2026

**Duration:** One Day

**Target Participants:** Faculty + students

**Number of Participants:** 24

Signature of the Coordinator



## UCSP CLUB PRESENTS

# RECENT ADVANCEMENTS IN SIW-BASED FILTERING ANTENNAS

### Invited Speaker

Dr. Arvind Kumar  
Assistant Professor  
Visvesvaraya National Institute of  
Technology (VNIT)  
Nagpur, India

### About the Talk

This session will cover the latest research advancements in substrate integrated waveguide (SIW) based filtering antennas, focusing on modern design approaches, performance optimization, and real-world RF communication applications.

### TARGET AUDIENCE

- UG & PG Students (ECE / RF / Microwave)
- Research Scholars
- Faculty Members
- Industry Enthusiasts

Organized by **UCSP Club**

Coordinator: **Dr. Vijay B. T.**



**DATE:** 7th February 2026



**TIME:** 10:00 AM - 12:00 PM



**MODE:** Online



### Registration

Scan the QR Code to Register

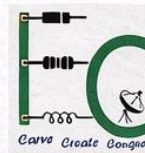


Organized by

**UCSP Club**



Coordinator: **Dr. Vijay B. T.**



Signature of the Coordinator

Recent Advancements in SIW-Based Filtering Antennas - UCSP


Saturday, February 7 · 10:00am – 12:00pm

Time zone: Asia/Kolkata

Google Meet joining info

Video call link: <https://meet.google.com/kkw-fizm-cyz>

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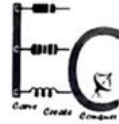


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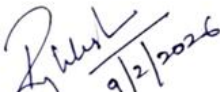
### CERTIFICATE OF APPRECIATION

**This is to certify that Dr. Arvind Kumar**, Assistant Professor, Department of Electronics and Communication Engineering, **Visvesvaraya National Institute of Technology (VNIT), Nagpur**, India, delivered an expert lecture as **Resource Person** in an **Online Expert Talk/Webinar** on **“Recent Advancements in SIW-Based Filtering Antennas”**, organized by the **UCSP Club, Department of Electronics and Communication Engineering, The National Institute of Engineering (NIE), Mysuru, India**, on **7th February 2026** via **Google Meet**.

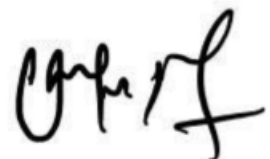
This certificate is issued as a **token of appreciation** for his valuable contribution and academic support.

  
Faculty Coordinator 09/02/26

Dr. Vijay B T  
**Dept of E & C Engg.**  
The National Institute of Engineering  
Mysuru - 570008

  
HOD/Principal

Dr. Rajalekshmi Kishore  
**Associate Professor & Head**  
Dept. of Electronics & Communication Engg.  
The National Institute of Engineering  
Mysuru - 570008



Signature of the Coordinator

Dr. Arvind Kumar (Presenting)

### MODAL FIELDS IN SIW

- The modal field propagation in SIW interconnects is similar to classical rectangular waveguides.
- Only TE<sub>n0</sub> modes ( $n=1, 2, \dots$ ) can be supported by SIW structures.
- Also called **postwall waveguide** or **laminated waveguide**.

10:21 AM | Recent Advancements in SIW-Based Filterin...

Dr. Arvind Kumar (Presenting)

### A MULTIPLEXING FILTERING ANTENNA

Fig Comparison of the measured and simulated S-parameters

Measured and simulated realized gains

- The proposed antenna has one shared radiator but four ports working in different frequency bands, and thus, it can simultaneously support four different transmission channels.

11:19 AM | Recent Advancements in SIW-Based Filterin...

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Dr. Arvind Kumar (Presenting)

## FABRICATION AND MEASUREMENTS

- A compact self-diplexing antennas, using HMSIW cavity resonator.
- The measured isolation of better than -30 dB.
- This property makes them suitable for a self diplexing applications.

• Design and Experimental Verification of Dual-Fed, Cavity-Backed Antenna-Diplexer using HMSIW Technique. *IEE Transactions on Antennas and Propagation*, 13, 380 – 385.  
 • Design of a self-diplexing antenna using SIW technique with high isolation. *Elsevier AEU-International Journal of Electronics and Communications*, 94, 386-391.

DR. ARVIND KUMAR, VNIT NAGPUR      2/7/2026      meet.google.com

10:52 AM | Recent Advancements in SIW-Based Filterin...

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Teja Jampani

Dr. Arvind Kumar

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## E-FIELD DISTRIBUTION FULL-MODE, HMSIW AND QMSIW

Full-mode SIW      HMSIW      QMSIW

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## SIW TRANSITIONS/ INTERCONNECTS

Microstrip to SIW transition

CPW to SIW transition

COAX to SIW Transition

Fig: interconnects with SIW

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## DESIGN RULES FOR AN SIW

❖ **Design Rules**

- ✓  $d/p \geq 0.5$  and
- ✓  $d/\lambda_0 \leq 0.1$

❖ **Effective Width**

- ✓  $a_{eff} = a - \frac{d^2}{0.95 + p}$

To ensure the minimum leakage of

Fig: SIW Configuration (3D)

Fig: Equivalent Dielectric Filled Waveguide

- $p$  -pitch distance
- $d$  - via diameter
- $a$  is via to via separation
- $a_{eff}$  is separation between the side walls.

- Nonstandard waveguide, supports TE<sub>n0</sub> modes
- Does not supporting the propagation of TM modes

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Dr. Arvind Kumar (Presenting)

### WHY SIW???

Guided wave propagation in microwave region preferably obtained by using printed lines and waveguides.



- ❖ **MICROSTRIP LINES** (Planar)
  - Light and compact
  - Low cost fabrication
  - High losses, low power capability
  - High cross-talk
- ❖ **METALLIC WAVEGUIDES** (non-planar)
  - Low losses, high power capability
  - Completely shielded
  - Bulky and expensive
  - Difficulties with active components

10:23 AM | Recent Advancements in SIW-Based Filter...



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## **Report on Online Expert Talk**

### **Introduction**

**The Department of Electronics and Communication Engineering, The National Institute of Engineering (NIE), Mysuru, through the UCSP Club, organized an Online Expert Talk/Webinar on 7th February 2026 via Google Meet. The event was conducted as part of the department's academic enrichment activities to expose students and faculty members to recent advancements in research and emerging technologies.**

### **Objective**

**The primary objective of organizing this expert talk was to enhance technical knowledge, promote research awareness, and bridge the gap between theory and current research trends in antenna and microwave engineering. The session aimed to motivate students towards higher studies and research by providing insights from an experienced academician and researcher.**

### **About the Resource Person**

**Dr. Arvind Kumar is an Assistant Professor in the Department of Electronics and Communication Engineering at Visvesvaraya National Institute of Technology (VNIT), Nagpur, India. He is a recipient of the Young Faculty Research Fellowship (YFRF) Award from MeitY, Government of India, and the Scientific High-Level Visiting Fellowship from the Government of France. He is a Senior Member of IEEE with research expertise in SIW-based antenna and microwave systems.**

### **What was the Event About?**

**The expert talk focused on recent advancements in Substrate Integrated Waveguide (SIW)-based filtering antennas, covering fundamental concepts, design challenges, performance metrics, and emerging applications in modern wireless communication systems.**

### **Details of the Event**

**The online expert talk was conducted on 7th February 2026 from 10:00 AM to 12:00 PM using the Google Meet platform. The session began with a welcome address by the faculty coordinator, followed by the introduction of the resource person. Dr. Arvind Kumar delivered an in-depth lecture on SIW-based filtering antennas, highlighting their importance in compact, high-performance RF and microwave systems. The talk covered**



**Signature of the Coordinator**

**design methodologies, integration of filtering and radiating functions, recent research outcomes, and practical challenges in implementation. The session was interactive, with students and faculty members actively participating in the Q&A segment. The event witnessed enthusiastic participation from undergraduate students, postgraduate students, and faculty members of the department.**

#### **Outcome of the Event**

**The event successfully enhanced participants' understanding of advanced antenna technologies and current research trends. Students gained valuable insights into research directions, publication opportunities, and career pathways in antenna and microwave engineering. Faculty members benefited from the technical discussions and potential research collaboration opportunities. Overall, the event achieved its objective of academic enrichment and research motivation.**

A handwritten signature in black ink, appearing to be 'C. K. S.', written in a cursive style.

**Signature of the Coordinator**