National Institute of Technology Rourkela

Progress Seminar

Seminar Title	: Chipless RFID Tags for Product Tracking and Identification
Speaker	: Rashmirekha Kalyani Mishra (Rollno : 921ec5001)
Supervisor	: Santanu Kumar Behera
Venue	: Seminar Hall (EC-303)
Date and Time	: 15 May 2025 (4.30PM)
Abstract	: Chipless Radio Frequency Identification (CRFID) are RFID sensors which do not have any in-built chip inside them. These are useful for wireless and nonintrusive monitoring. Thus, these are promising technologies for product tracking and identification. Here, we present three novel CRFID tag designs aimed at enhancing efficiency and applicability across various domains. Here, we have proposed three CRFID tag designs for product identification. **Design 1** is a multibit CRFID tag for product tracking and identification applications, which operates from 3 &ndash 9 GHz, giving 9 distinct resonating peaks at 3.7 GHz, 4.8 GHz, 5.4 GHz, 5.78 GHz, 5.98 GHz, 6.3 GHz, 6.9 GHz, 7.6 GHz and 8.8 GHz respectively. **Design 2** is a CRFID Tag for packaged solid product identification. Operating in 1 &ndash 6 GHz frequency, it shows14 distinct resonant bits at 1.5GHz, 1.6 GHz, 1.7 GHz, 1.8GHz, 1.9 GHz, 2.0GHz, 2.2 GHz, 2.4 GHz, 2.7 GHz, 2.9 GHz, 3.25 GHz, 3.75 GHz 4.4GHz and 5.4 GHz. This design can be used to identify and trace the type of food inside any packaged container. A packet of biscuit was also measured to know the performance of the tag and the read-range was around 48 cm. **Design 3** is a foldable multibit CRFID Tag for Packaged Liquids Identification. It operates from 1 &ndash 6 GHz frequency, with 13 resonant peaks at 1.2GHz, 1.3 GHz, 1.4 GHz, 1.5GHz, 1.6GHz, 1.7GHz, 1.9 GHz, 2.1GHz, 2.3 GHz, 2.6 GHz, 3.2 GHz, 3.8 GHz and 4.8 GHz. Different packaged liquid food products like soft drinks, flavoured milk and tea inside thermos were measured in this design. Their respective RCS and read-range were observed. All the simulations were done using CST microwave studio.