

COUNCIL FOR THE INDIAN SCHOOL CERTIFICATE EXAMINATIONS, NEW DELHI
INDIAN CERTIFICATE OF SECONDARY EDUCATION (CLASS - X) - YEAR 2021

No. TT 40023213

1211329/006



STATEMENT OF MARKS

Name ABHISHEK P
of BISHOP COTTON BOYS' SCHOOL, BENGALURU

Unique ID 7413095

Son of

Smt CHRISTINA TERESA PRATHIBA
Shri D PAUL ANTHONY GERALD

SUBJECTS	TOTAL MARKS Max. Marks:100	PERCENTAGE MARKS
ENGLISH ENGLISH LANGUAGE LITERATURE IN ENGLISH	089 097	93 NINE THREE
KANNADA	096	96 NINE SIX
HISTORY, CIVICS & GEOGRAPHY HISTORY & CIVICS GEOGRAPHY	095 100	98 NINE EIGHT
MATHEMATICS	093	93 NINE THREE
SCIENCE PHYSICS CHEMISTRY BIOLOGY	090 084 098	91 NINE ONE
COMPUTER APPLICATIONS	100	100 ONE HUNDRED
Internal Assessment SUPW AND COMMUNITY SERVICE		GRADE A

Date of birth as

certified by the (in words) Ninth August Two Thousand Four

Head of the School

at the time of (in figures) 09.08.2004

registration

RESULT - PASS CERTIFICATE AWARDED

Date of declaration of Result - 24.07.2021

Note: 1. The pass mark for each subject is 33%
2. No divisions are awarded.

Chief Executive & Secretary



Career Essentials in Generative AI by Microsoft and LinkedIn

Learning Path completed by Abhishek P
Jul 29, 2024 at 02:00PM UTC • 4 hours 53 minutes

Top skills covered

Computer Ethics

Artificial Intelligence (AI)

Generative AI

A handwritten signature in black ink.

Head of Global Content, Learning

Certificate ID: 7e3a5b6f5389f380c1e2e4417eaf0ef1af73be91f13a20edc3ce0bc4d756c8b





Career Essentials in Data Analysis by Microsoft and LinkedIn

Learning Path completed by Abhishek P
Aug 01, 2024 at 05:40AM UTC • 9 hours 13 minutes

Top skills covered

Data Analysis

Data Visualization

Data Analytics

A handwritten signature in black ink that reads "Dan Boden".

Head of Global Content, Learning

Certificate ID: 5119145ffa5bab2d5058e760b07f4b757ef43a59bd6b4c0110faed3a701le14





Career Essentials in Cybersecurity by Microsoft and LinkedIn

Learning Path completed by Abhishek P
Aug 01, 2024 at 01:03PM UTC · 5 hours 23 minutes

Top skills covered

Cybersecurity

Information Security Awareness

Threat & Vulnerability Management

A handwritten signature in black ink.

Head of Global Content, Learning

Certificate ID: ifa7fea6e4cd1449fce72a5674552dd88242192b7b053147a286801179059b57





Certificate of Accomplishment



PRESENTED TO

ABHISHEK P

The bearer of this certificate has passed the HackerRank skill certification test

Earned on: **22 Apr, 2025**

ID: A375D4291AE2

A handwritten signature in black ink that appears to read "Harishankaran".

Harishankaran K

CTO, HackerRank

Good Coder



Department of
Science & Humanities
EC Campus

Rank wise					Section wise		
SRN	Name	Section	Score	%	SRN	Name	Section
PES2UG23CS103	ATHARV MITTAL	C	581.41	86.78	PES1UG23CS024	Adishree Gupta	A
PES2UG23CS082	Anusha Shrivastava	B	560.67	83.68	PES2UG23CS014	AAYAN VIKRAM SINGH	A
PES2UG23CS096	Arya Deshpande	C	560.67	83.68	PES2UG23CS039	Akhilesh M	A
PES1UG23CS024	Adishree Gupta	A	546.33	81.54	PES2UG23AM002	Abhishek P	A
PES2UG23CS363	NANDAN D	I	475.56	70.98	PES2UG23CS030	ADITYA CS	A
PES2UG23EC012	Anagha Murugan	B	468.92	69.99	PES2UG23CS015	Aayush Jha	A
PES2UG23CS014	AAYAN VIKRAM SINGH	A	463.67	69.2	PES2UG23EC008	Akash T	A
PES2UG23CS039	Akhilesh M	A	393.58	58.74	PES2UG23CS024	Abhranshu Sarkar	A
PES2UG23EC087	Mohithkumar M S	H	393.58	58.74	PES2UG23CS033	ADVAITH NAMBIAR	A
PES2UG23CS441	Pratyush Sinha	K	389.03	58.06	PES2UG23CS003	A Shri Karthik	A
PES2UG23CS454	R Harshith	K	385.67	57.56	PES2UG23CS082	Anusha Shrivastava	B
PES2UG23CS453	Pushkar	K	385.67	57.56	PES2UG23EC012	Anagha Murugan	B
PES2UG23AM074	Pranav V Bhat	J	385.67	57.56	PES2UG23CS103	ATHARV MITTAL	C
PES2UG23AM002	Abhishek P	A	381.79	56.98	PES2UG23CS096	Arya Deshpande	C
PES2UG23AM116	VITTAL DC	P	377.23	56.3	PES2UG23CS092	ARNAV SINHA	C
PES2UG23CS526	Sangam Shrestha	L	374.44	55.89	PES2UG23CS134	BOJJA RAKSHITHA	C
PES2UG23CS400	Nitin Dhotre	H	369.27	55.11	PES2UG23CS115	Purandar	C
PES2UG23CS713	Yash Verma	P	366.52	54.7	PES2UG23CS166	DELISHA RIYONA DSOUZA	D
PES2UG23CS166	DELISHA RIYONA DSOUZA	D	365.32	54.53	PES2UG23CS242	Jeevitha S	F
PES2UG23CS030	ADITYA CS	A	363.41	54.24	PES2UG23EC078	Madhulatha Ramachandra	G
PES2UG23CS015	Aayush Jha	A	363.41	54.24	PES2UG23CS291	Kshitij Koushik Kota	G
PES2UG23EC008	Akash T	A	363.41	54.24	PES2UG23EC087	Mohithkumar M S	H
PES2UG23CS092	ARNAV SINHA	C	362.53	54.11	PES2UG23CS400	Nitin Dhotre	H
PES2UG23CS421	PRAJWAL B H	H	362.45	54.1	PES2UG23CS421	PRAJWAL B H	H
PES2UG23CS024	Abhranshu Sarkar	A	356.18	53.16	PES2UG23CS404	Omkar Patil	H

DEPARTMENT OF SCIENCE & HUMANITIES PES UNIVERSITY-EC CAMPUS PERSENTS

GOOD CODER COMPETITION

Hackathon only for 1st year students
of EC Campus to find and recognise

TOP 50 CODERS



NO REGISTRATION FEE



Date: 8th May Wednesday

Time: 2:30 - 4:00 pm

Platform: Hackerrank

Coding Language : C and Python  

Venue: Seminar Hall 1,2



DEPARTMENT OF SCIENCE & HUMANITIES SAMKALANAM - 2024

"PLAY WITH MATH"

This is to certify Abhishek P
has been awarded with Second prize in the event

"TREASURE HUNT"

held on 22/3/2024 at PESU-EC Campus

A handwritten signature in black ink.

Dr. Karthiyayini O
Chairperson

A handwritten signature in black ink.

Dr. Deepa Nair
Chairperson

A handwritten signature in black ink.

Prof. Nagarjuna Sadineni
Pro Vice-Chancellor

A handwritten signature in black ink.

Dr. J Surya Prasad
Vice-Chancellor

Department of Science & Humanities PES University- EC Campus Presents

SAMKALANAM 2024

"Playing with mathematics"

Date of event: 27-03-2024 in M R D Student Center

Pre-Events date: 22-03-2024

fx f(x)

Problem Solving using Differential Equations on 22-03-2024

Time: 1.30 p.m. - 2.30 p.m.

2 students in each group.

Venue: Seminar Hall 1

Treasure Hunt on 22-03-2024

Time: 2.30 p.m. - 3.30 p.m.

4 students in each group.

Venue: Quadrangle (Main Building)

Prize Pool Details

Problem Solving using Differential Equations.

Rs 6000 /-

Treasure Hunt

Rs 6000 /-

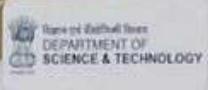
Here for you

PRIZE POOL
Rs 12000 /-

Last date to register: 20-03-2024



EXCLUSIVELY FOR FIRST
YEAR STUDENTS



KOLHAPUR INSTITUTE OF TECHNOLOGY'S COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR

Accredited 'A+' Grade by NAAC With CGPA 3.33 & '06' programs accredited by NBA, New Delhi

&

KIT'S INNOVATION AND RESEARCH FOUNDATION
DST Supported NIDHI i-TBI

A National Level Technical Event

PIONEER 2024

25- 26 February 2024, Organized under ISTE Student Chapter

Certificate

This is to certify that,

Mr./Ms.Abhishek P...... from
PES University..... is awarded as Winner / 1st Runner up /
2nd Runner up under the domain Civil & Env.....at "Prakalp"-
'A National level Project Presentation Competition' during
"PIONEER 2024", Organized under ISTE Student Chapter.

Mr. Danish Ustad

Chairperson
ISTE Student Chapter

Prof. Deepali Jadhav

Convener
Pioneer 2024

Prof. Ashwini Shinde

Faculty Advisor
ISTE Student Chapter

Dr. Jitendra Bhat

Dean,
Student Activity

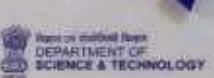
Dr. Manoj Mujumdar

Registrar
KITCoEK

Dr. Mohan Vanarotti

Director
KITCoEK

PIONEER 2024



A National Level Technical Event

prakalp

25th & 26th
February

2nd
RUNNER UP

Meeting Notes - 16/09/2025

- 5th Sem, B.Tech CSE (AI & ML) @ PES University
- Remote/Hybrid Fall, Winter and Summer - 2026 (On-Site)
- SDE, Summer Analyst, AI, ML, DS, CyberSec, UI/UX/FullStackDev, Blockchain, IoT
- Machine Learning, Cyber Security, Stack Development
- Bishop Cotton Boys' School, Bengaluru ICSE 10th - 95.16%
BASE PU College Rajajinagar, Bengaluru Kar State, PU XII - 94.5%
- KCET 2023 -> PES University
- Linux Dev > C/C++ Dev > Firmware Dev | 25k-40k+| 8(2 mon)-12mon
- Research :

“Radiation pollution and its impact on living creatures in and around Bangalore”, Dr. Revanasiddappa M, Dept. of S & H, PES University, made a prototype, 2nd Runner Up, Prakalp (Pioneer-2024), Hackathon/ Project/Innovation/Startup Presentation Competition, KITCoE, Kolhapur, Paper yet to be published.

“Facial Paralysis Detection and Recovery Tracking Using Deep Learning and Digital Twin Models”, Dr. Pooja Agarwal, Capstone

“Multimodal Generative Augmentation + Cross-Modal Learning for Bipolar Disorder”, Dr. Arti Arya, Charperson Dept. of CSE (AI & ML), PES University, AFML

“Education Analytics: Linking Study Habits to Academic Performance, predictive models”, Dr. Suja CM, Dept. of CSE, PES University

- Projects :

Fitium - Python based Fitness Monitoring System which aims at providing a Fitness Tracker cum Analyzer using weight, height, steps etc for modern health analysis such as Heart Rate assessment, BMI Calculation etc. It is a customizable lightweight application.

MedSnap - MedSnap is a hospital management system developed using MERN stack and MongoDB. The system includes modern APIs, multiple Login Methods, Patient Profile, Scan Reports, Receipts, Prescription etc. Integrated a QR based login system for easy patient access.

LearnHub - E-Learning Platform, DBMS

CRM App - Customer Relations Management System, SE

Modern Fire Alarm System

The system utilizes a Gas/Smoke Sensor (MQ-2), Temperature Sensor (LM35CAZ) and Flame Sensor to monitor environmental conditions and identify fire-related anomalies. When a fire hazard is detected, the system triggers an alarm(buzzer and LED light indication) and sends ***instant alerts to the system with a UI website which will display all the real time values that the system measures and cautions the user in case of a Fire.*** Additionally real-time Temperature value(in °C) and flame/gas indication(Boolean) will be displayed on an inbuilt LCD display. It can be run on a 9V battery(can also be powered by the system when connected).

We have also incorporated detailed analysis using multiple graphs(temperature and gas values plotted against time-utilizes latest 100 data points) based on various data points collected during fires which helps in prediction and analysis of potential fire risks which can be avoided in the future. This model breaks the barriers and drawbacks of traditional Fire Alarm Systems through modern technological integrations. This model can also be used to alert remote users through a Wi-Fi module(ESP8266/ESP32) or a GSM module making it highly flexible.

• ACHIEVEMENTS

- Prakalp (Pioneer-24)
- Math Day 2024 (SAMKALANAM): 1st Runner-Up in Treasure Hunt of SAMKALANAM-2024 as part of Math Day-2024 celebrations organized by Science and Humanities Department (S&H), PES University.
- Good Coder Competition (GCC) Hackathon: Secured 14th rank in Good Coder Competition (GCC) Hackathon at PES University, organized by the Science and Humanities Department (S&H). The competition saw over 342 registrations, and the top 50 participants were recognized.

• CERTIFICATIONS

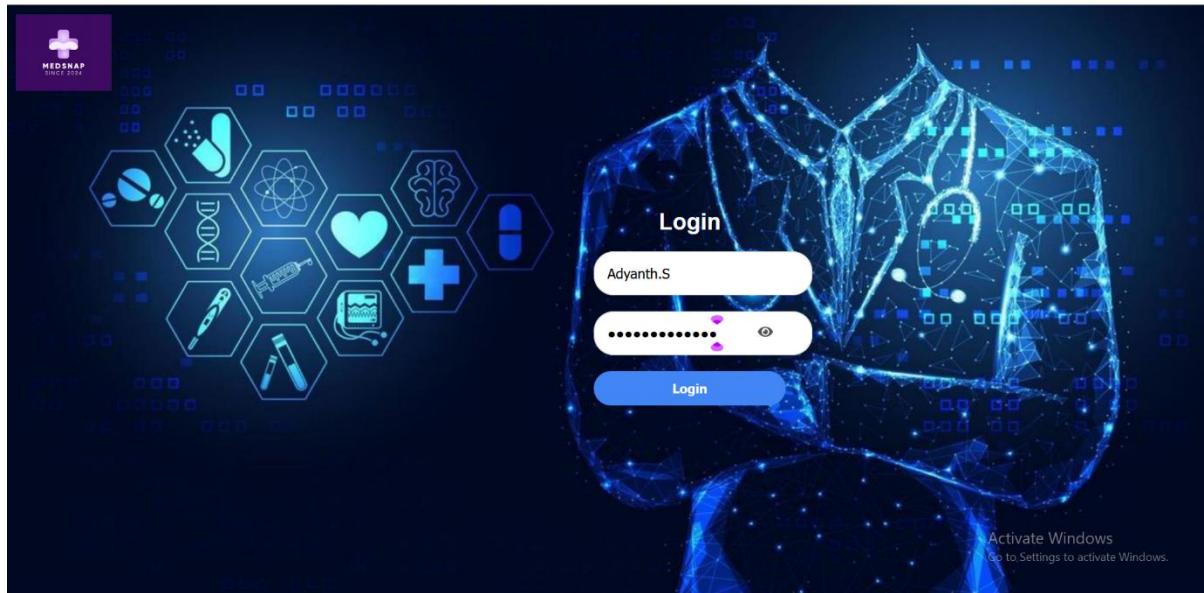
- [Problem Solving](#) BY Hackerrank
- [Career Essentials in Cybersecurity by Microsoft and LinkedIn](#)
- [Career Essentials in Data Analysis by Microsoft and LinkedIn](#)
- [Career Essentials in Generative AI by Microsoft and LinkedIn](#)

Skills

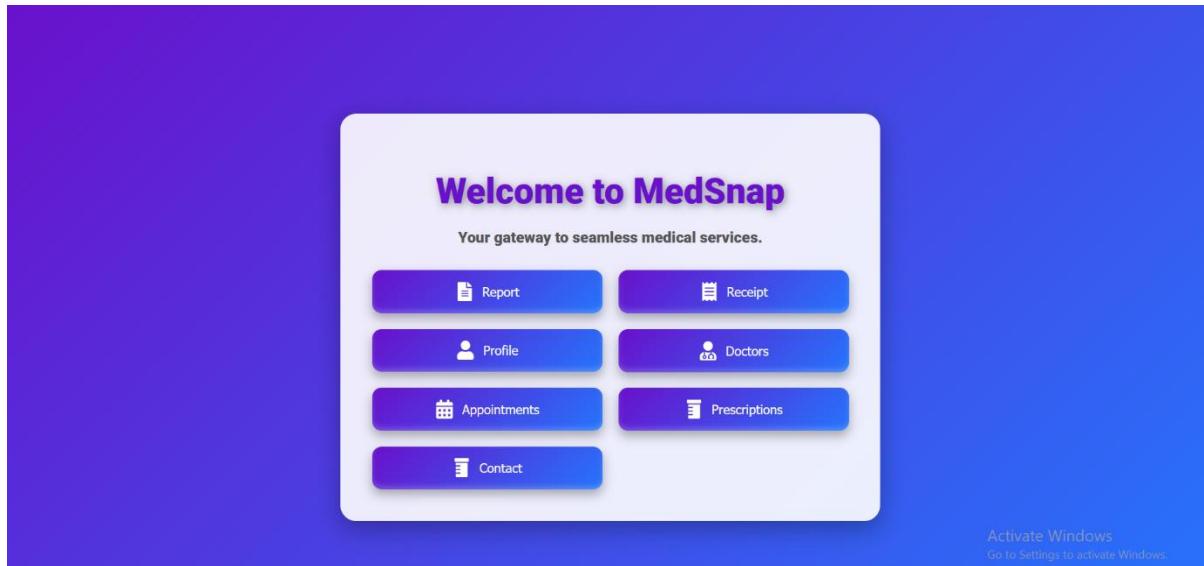
- **Programming Languages:** Python (proficient), Java (intermediate), C/C++ (moderate), R (basic)
- **Web & Frameworks:** HTML, CSS, JavaScript, MERN stack
- **Cloud:** Azure, AWS, Git, MongoDB, SQL
- **Machine Learning:** PyTorch, pandas, numpy, scikit-learn, TensorFlow

Web Tech Mini Project

Login Page:



Home page:



Report :

Report

Activate Windows
Go to Settings to activate Windows Home

File Name	View	Download
tb_structural.v	View	Download
UE23CS251A_fc78f723-92b2-11ef-a0a6-0a871f24533b_20241029161933.pptx	View	Download

Home

Receipt :

Receipt

Activate Windows
Go to Settings to activate Windows Home

File Name	View	Download	Delete
tb_structural.v	View	Download	Delete
iuKXATION.pptx	View	Download	Delete

Home

Prescription:

Prescription

Activate Windows
Go to Settings to activate Windows Home

File Name	View	Download
tb.jpeg	View	Download

Profile:

Profile UI

Home
Dashboard

Profile Settings

Profile Photo
 WIN_20230407_21_14_15_Pro.jpg



Name

Email

Phone

Activate Windows
Go to Settings to activate Windows.

Profile UI

Home
Dashboard

Profile Settings

Profile Photo
 WIN_20230407_21_14_15_Pro.jpg



Name

Email

Phone

Activate Windows
Go to Settings to activate Windows.

Dashboard:

Good Afternoon,

Adyanth

34

Years Old

180

Height, cm

78

Weight, kg

A+

Blood Type

Temperature

36.6°C

-1.6%

Blood Sugar

120 / 160 mg/dL

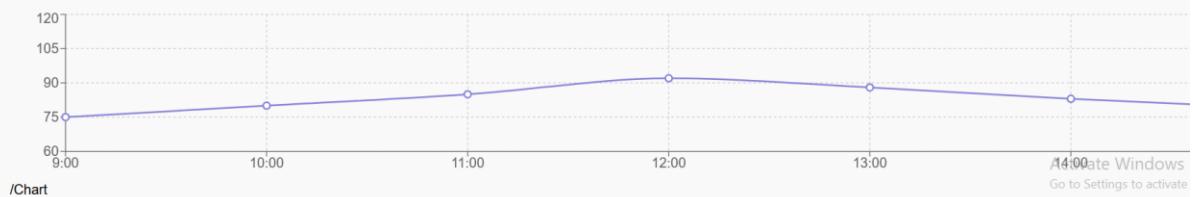
+2.1%

Blood Pressure

80 / 120 mmHg

+0.4%

Heart Rate



Doctor's profile:

Home

Doctor Profile

DR. BAILEY
DUPONT

67%
2021 75%
2022



I am a doctor in the handling of the COVID-19 vaccination. I have a lot of experience in the field of pandemics, from handling viruses to vaccines.

Doctor Profile

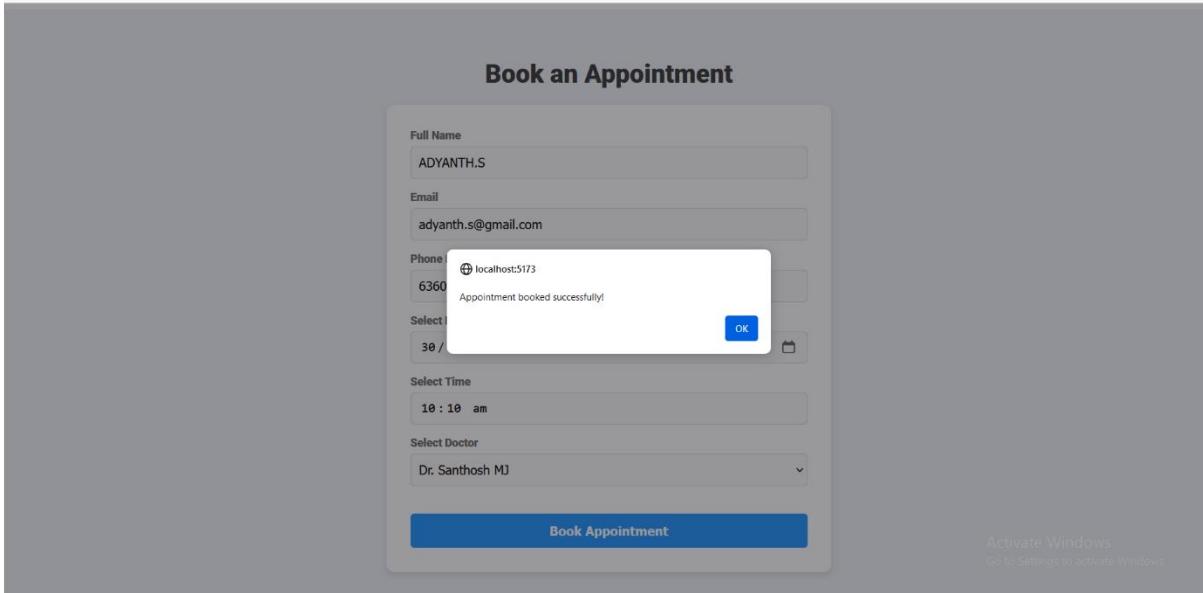
DR.
Pushparaja
Reddy

80%
2021 85%
2022



Specialist in internal medicine with expertise in diabetes management and patient education. Over 10 years of experience.

Appointment Page:



database Successfully created:

```
}
```

```
New Appointment Created: {
```

```
  name: 'ADYANTH.S',
```

```
  email: 'adyanth.s@gmail.com',
```

```
  phone: '6360060718',
```

```
  date: '2024-11-30',
```

```
  time: '10:10',
```

```
  doctor: 'Dr. Santhosh MJ',
```

```
  _id: new ObjectId('67401f3cb8add7e15a87b0e3'),
```

```
  createdAt: 2024-11-22T06:05:48.940Z,
```

```
  updatedAt: 2024-11-22T06:05:48.940Z,
```

```
  __v: 0
```

```
}
```

MongoDb upadated

```
_id: ObjectId('67401f3cb8add7e15a87b0e3')
```

```
name : "ADYANTH.S"
```

```
email : "adyanth.s@gmail.com"
```

```
phone : "6360060718"
```

```
date : "2024-11-30"
```

```
time : "10:10"
```

```
doctor : "Dr. Santhosh MJ"
```

```
createdAt : 2024-11-22T06:05:48.940+00:00
```

```
updatedAt : 2024-11-22T06:05:48.940+00:00
```

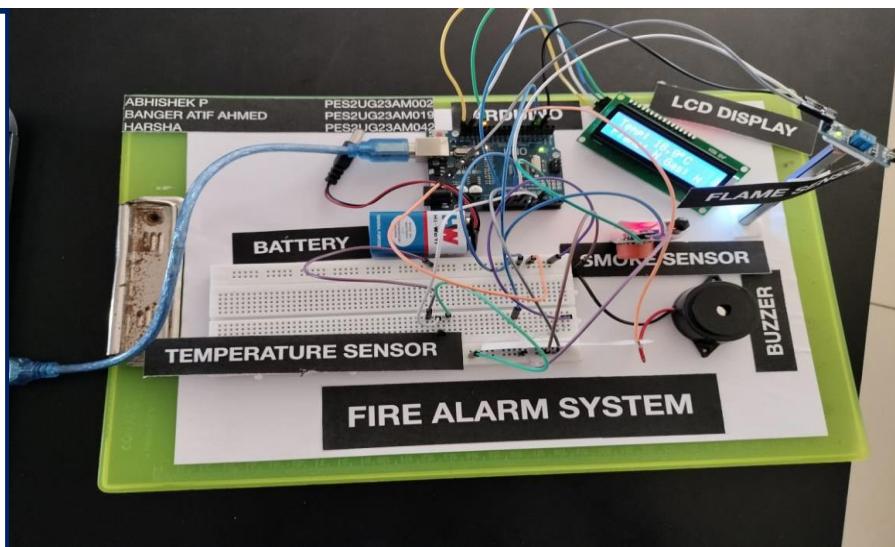
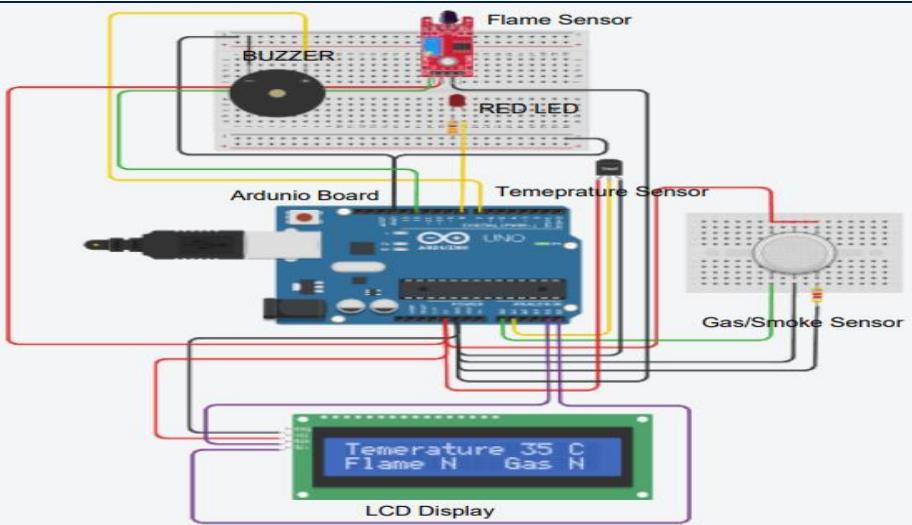
```
--v : 0
```

Fire Alarm System

Fire hazards pose a serious threat to life and property, making early detection and rapid response essential. This project presents a smart Fire Alarm System that integrates multiple sensors to detect potential fire risks in real time. The system utilizes a Gas/Smoke Sensor (MQ-2), Temperature Sensor (LM35CAZ) and Flame Sensor to monitor environmental conditions and identify fire-related anomalies. When a fire hazard is detected, the system triggers an alarm(buzzer and LED light indication) and sends instant alerts to the system with a UI website which will display all the real time values that the system measures and cautions the user in case of a Fire. Additionally real-time Temperature value(in °C) and flame/gas indication(Boolean) will be displayed on an inbuilt LCD display. It can be run on a 9V battery(can also be powered by the system when connected).

We have also incorporated detailed analysis using multiple graphs(temperature and gas values plotted against time-utilizes latest 100 data points) based on various data points collected during fires which helps in prediction and analysis of potential fire risks which can be avoided in the future. We have developed an eco-friendly, lightweight, highly durable and cost-efficient model with a minimalistic design. This model is tested multiple times under all possible circumstances with an excellent accuracy and precision.

This model is highly scalable and IoT-enabled solution for fire detection, improving response times and minimizing potential damage in residential and commercial spaces. This model breaks the barriers and drawbacks of traditional Fire Alarm Systems through modern technological integrations. This model can also be used to alert remote users through a Wi-Fi module(ESP8266/ESP32) or a GSM module making it highly flexible.



Abhishek P
PES2UG23AM002



Harsha
PES2UG23AM042



Banger Atif Ahmed
PES2UG23AM019



Prof. Deepti C

ABHISHEK P
BANGER ATIF AHMED
HARSHA

PES2UG23AM002
PES2UG23AM019
PES2UG23AM042

ARDUINO

LCD DISPLAY

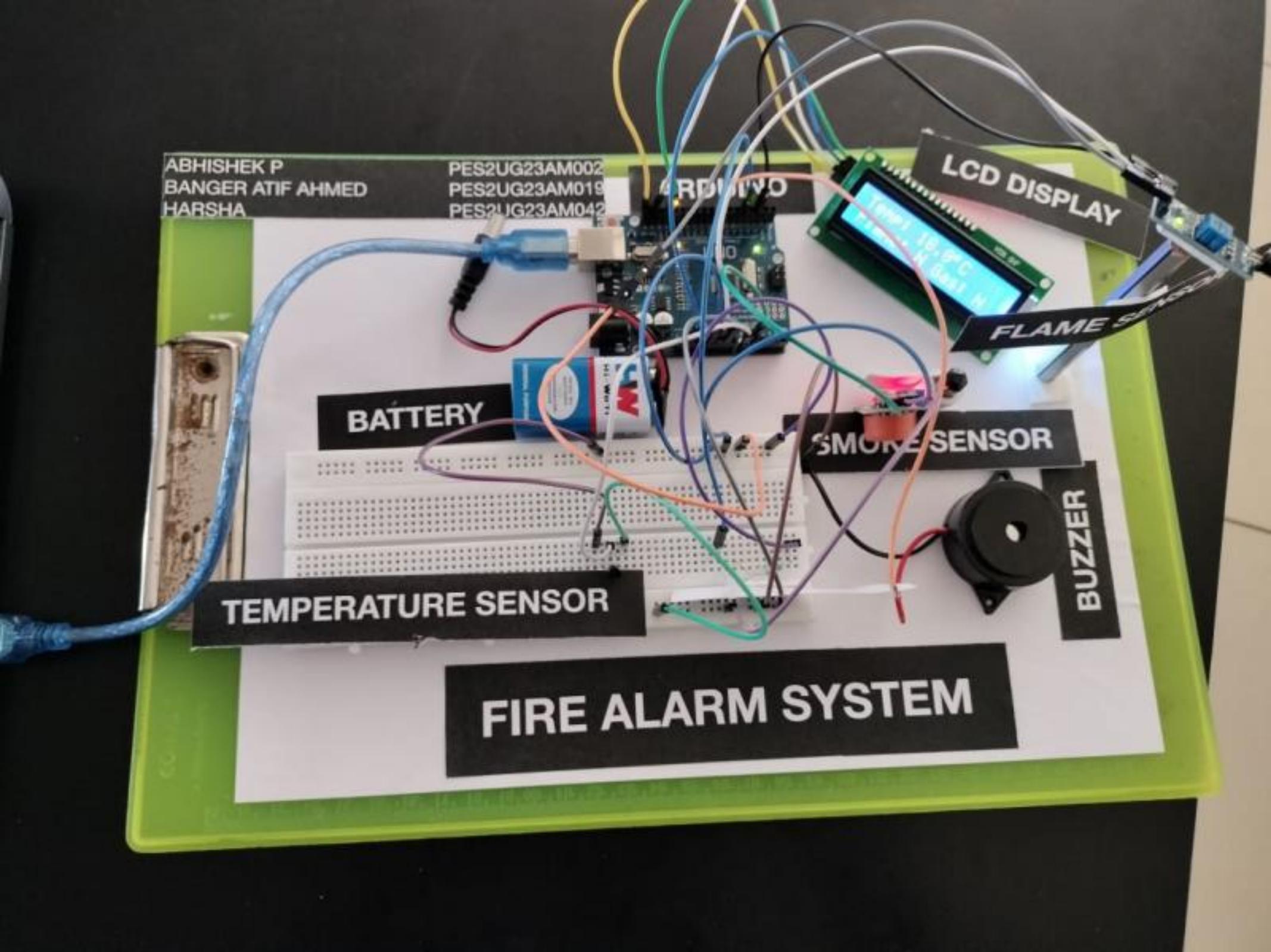
FLAME SENSOR

TEMPERATURE SENSOR

SMOKE SENSOR

BUZZER

FIRE ALARM SYSTEM



FIRE ALARM SYSTEM

Gas: 322

Flame: Not Detected

Temp: 19.99 °C

Buzzer: OFF

LED: OFF

System Normal

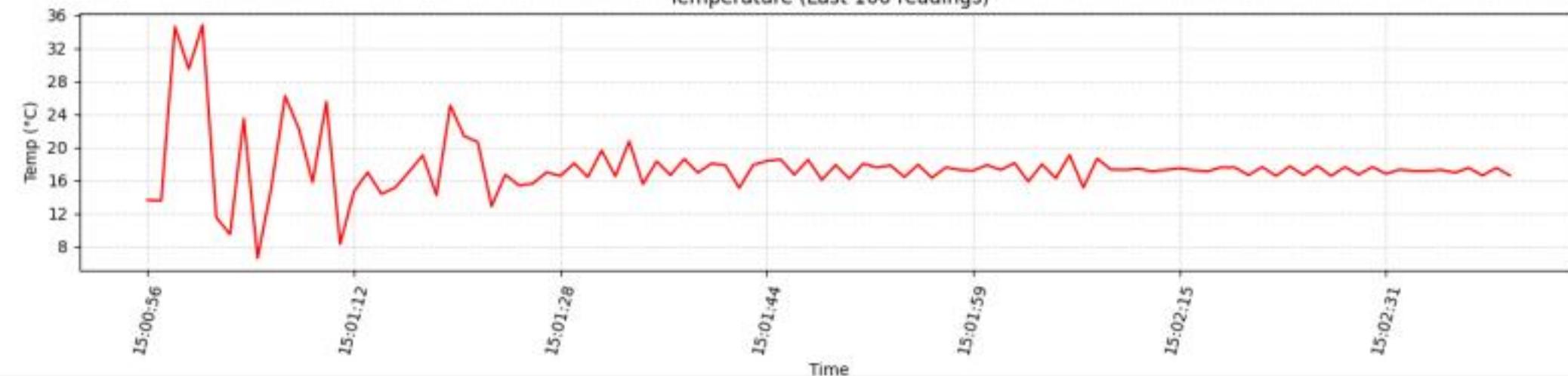
 Show Analysis

Figure 2

Gas Level (Last 100 readings)

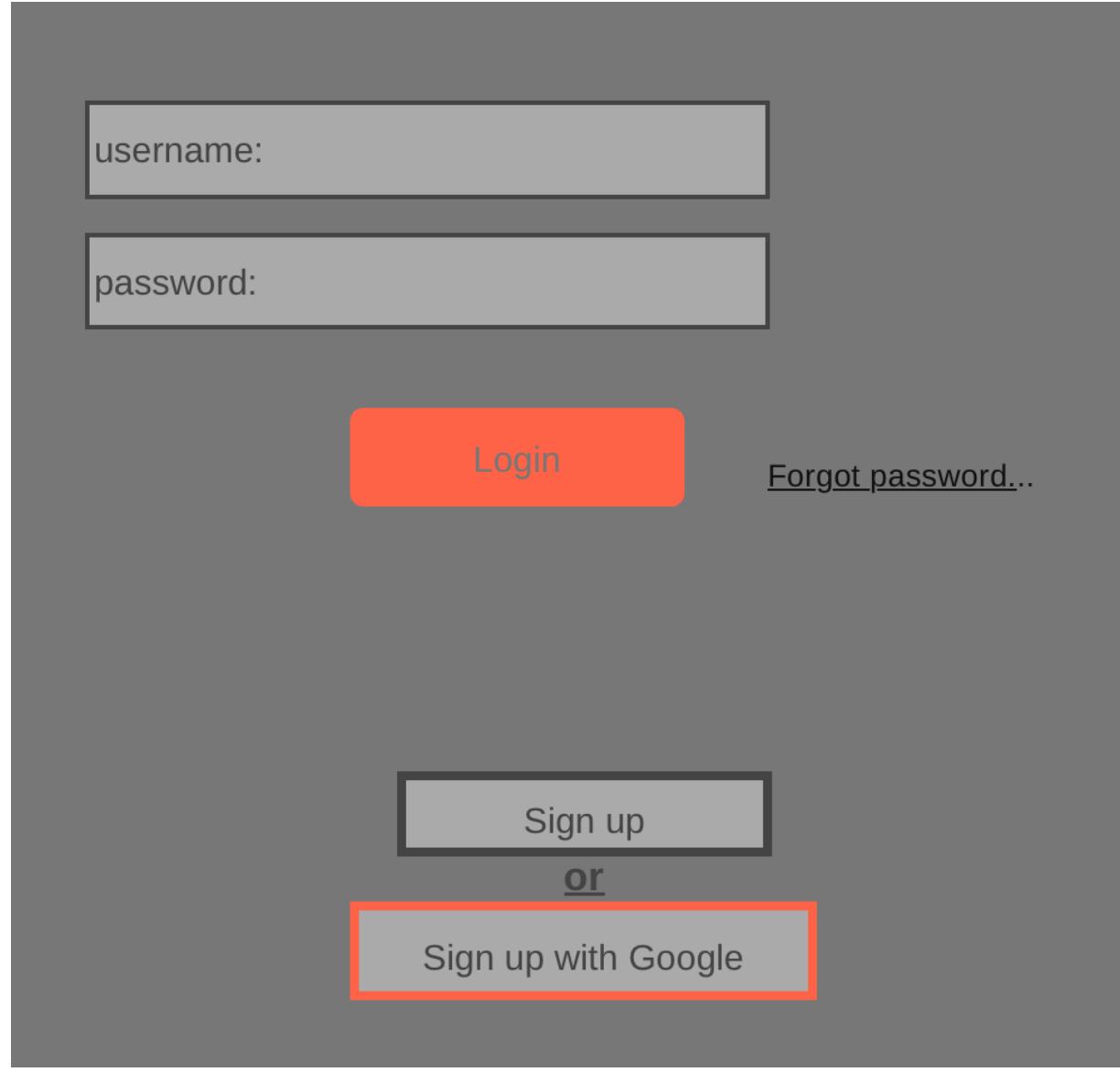


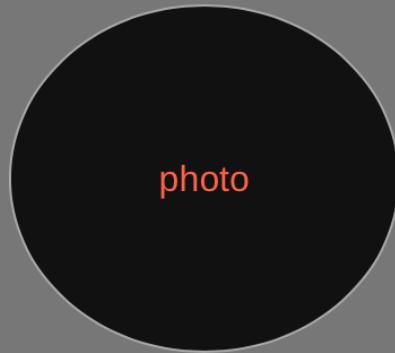
Temperature (Last 100 readings)



Name: ABHISHEK P ADYANTH S ADYAA G B	SRN: PES2UG23AM002 PES2UG23AM007 PES2UG23AM006
<p><u>PROJECT TITLE:</u></p> <p style="text-align: center;"><u>MedSnap</u></p> <p style="text-align: center;">Data Management</p>	
<p><u>PROJECT ABSTRACT:</u></p> <p>This project aims at developing software for Hospital Data Management. It includes a robust multiple method login and signup pages. The home page has all the details of the patient, and a toggle for multiple patients. It has many fields such as Scan reports, Prescription, Receipt etc. The main attraction of MedSnap is that it has a QR Code based login for convenience.</p>	
<p><u>TOOLS USED</u></p> <p>HTML, CSS JavaScript React Js, Node Js MongoDB Compass</p>	

SCREENSHOT/WIREFRAMES





QR Code

Name:

Gender:

Age:

ph no:

Address:

Guardian name:

Guardian ph no:

Scan Reports

Prescription

Receipt

Analysis

Scan Reports

| *Search...*

<i>SL.no</i>	<i>Content</i>	<i>Files</i>
1.	Report 1	<u>download.....</u>

Upload

Back

Prescription

| *Search...*

<i>SL.no</i>	<i>Content</i>	<i>Files</i>
1.	Prescription 1	<u>download.....</u>

Upload

Back

Receipt

| *Search...*

<i>SL.no</i>	<i>Content</i>	<i>Files</i>
1.	Receipt 1	<i>download.....</i>

Upload

Back

Name:

Email id:

Password:

Confirm password:

Ph no:

DOB:

Back

Create



PES
UNIVERSITY

Python for Computational Problem Solving(PCPS)

UE23CS151A

Mini Project
SEMESTER-I

ABHISHEK P	PES2UG23AM002
HARSHA	PES2UG23AM042
AADI	PES2UG23EC002
CHANDAN	PES2UG23CS142

FITIUM

FITNESS MONITORING SYSTEM(OVERVIEW)

This project aims at developing a Python-based Fitness Monitoring System called FITIUM. Fitium aims at providing a Fitness Tracker cum Analyser using weight, height, steps etc for modern health analysis such as heart rate assessment, BMI Calculation etc. Fitium is a customisable lightweight application supported by recent versions of Python.

End Users

- Individuals looking for a holistic fitness tracker
 - Individuals with health problems/concerns
 - Fitness Enthusiasts
-

WORK DISTRIBUTION

ABHISHEK P(PES2UG23AM002)

- Implement Blood Pressure Monitoring.
 - Implement Sugar Level Analysis.
 - Oversee the Integration of different components and Co-ordination of the project.
-

AADI S(PES2UG23EC002)

- Implement Heart Rate Assessment.
 - Project Presentation and formatting.
 - Target heart rate
-

HARSHA(PES2UG23AM042)

- Implement BMI Calculation.
- BMI body type indication

CHANDAN R(PES2UG23CS142)

- Implement Calorie Burn Estimation.
 - Implement Drink Water Alarm.
 - Code integration of heart rate assessment and sugar level analysis.
-

Modules

- Tkinter
 - pip
 - time
 - Pyler
 - Tkmacosx
-

KEY FUNCTIONS

- BMI calculation
 - Calorie burn estimation
 - Blood pressure monitoring system
 - Sugar level analysis
 - Heart rate assessment
 - Drink water alarm
-

Heart Rate assessment

For analysis of heart rate to find target heart rate based on age, and resting heart rate to indicate abnormal conditions.

Measured using electrical (electrocardiography) or Oximeter.

Drink Water Alarm

System to help the user to be hydrated throughout the day and reminds him to take water in regular intervals to have a good health.

Blood Pressure(BP) monitoring

BP monitoring with status classification on heart beat pace(systolic or diastolic) based on age and fitness.

BMI calculation

Body mass index for height-weight comparisons, weight status indicators and height-weight goal setting.

Calorie burn estimation

Calories burnt based on steps, pace of walk/jog/run.

Sugar level analysis

Sugar level analysis for pre-diabetes and diabetes with fasting and post prandial sugar levels.

References

- YouTube
 - chatGPT
 - GeeksforGeeks
 - Codemy
 - Cleveland Clinic
 - Canva
-

THANK YOU

Radiation pollution and its impact on living creatures in and around Bangalore

1 Prathamesh Devadiga 1 P Chirag Reddy D R 2 Revanasiddappa M,

3 Bhushi Prashanth 3 Abhishek P 3 G Srujana 3 Aadi Sirurmath

1 Department of Computer Science and Engineering, PES University, Electronic City Campus, Bangalore 560 100, India

2 Department of Science and Humanities, PES University, Electronic City Campus, Bangalore 560 100, India

3 Department of Science and Humanities, PES University, Electronic City Campus, Bangalore 560 100, India

*Corresponding Author: Mobile No. 9845977522, 08066186653, revanasiddappam@pes.edu

ABSTRACT

Radiation is a composition of energy, the one which gets emitted from any gadget of electronic origin which can travel through space. The amount of radiation being emitted by electronic gadgets has been escalating every year over the decade that has eventually led to radio-frequency noise pollution. The utilization of number of smart phones has expanded over the years that has no side effects on humans as this level (on an average of 1.72 GHz) of radiation pollution is tolerable by us but has accelerated the degradation of the lives of small birds such as sparrows leading to endangered bird population. The emitted radiations are non-ionizing in nature which causes interference in signal communication. Interference can be quoted as unwanted disturbance which leads to challenges like coverage problem, reception problem or even accessibility problems. Spectrum analysis tools are being included into radio system these days which proves its use by helping in analyzing the radiated signals. They offer insufficient information with respect to spectrum of a signal. To solve the above quoted complication of analyzing the spectrum, we have made use of the Real Time Spectrum Analyzer i.e., RTSA which can measure wide band of spectrum (particularly RF signal). We have also made use of USB-based battery powered RTSAs like Tektronix RSA306 which serves as a fruitful device to measure the radiations emitted in each region ranging from 9 kHz to 6.2 GHz. This device was beneficial in our radiation hunting applications. We have gathered radiation statistics across eleven locations in Bangalore which could be used to examine and analyze the radiation pollution levels in diverse environments. Based on our research data input, it reveals that the radiation pollution strength (on average across 11 observations is 1.72 GHz) in and around Bangalore is lower than the threshold limit as per the World Health Organization (WHO) that ranges from 900 MHz- 1800 MHz. As of now there are no side effects from the signal to the human beings in and around Bangalore.

Keywords: Tektronix; RSA306; RTSA; Radiation Hunting; WHO.

INTRODUCTION

With the uplift in technology, man has come across the dilemma of appreciating the information he has or to be shameful for the evil deeds that have resulted from his technological advancements. One such issue is radiation. Man built mobile phones and other electronic gadgets that fulfil his needs, but he hasn't yet seen any adverse consequences from his work. With today's cutting-edge 4G and 5G technologies, man has failed to understand how his innovations affect both nature and humanity. Magnetic compatibility is the capacity to run the surrounding circuits without influence (EMC). This concept is essentially the

highest achievement in enabling device independence for electromagnetic wave transmission. Even the most sophisticated electronic circuits today have the issue of absorbing nearby electromagnetic radiations. The use Electromagnetic compatibility (EMC) makes it possible for them to function without interfering with the EM waves being broadcast by other nearby devices. The first-time humanity saw the significant, yet subtle harm radiation emitted by gadgets was for military purposes. Nuclear weapon was a drastic effect of electronic pulse produced by their explosion and high-powered radar systems. The first effect of these weapons was to damage the device and the environment. Electronic devices could run at high clock speeds thanks to Boolean Logic, which gained traction in the 1970s. However, because to these advancements, this circuitry became more vulnerable to the effects of EMI, making EMC protections necessary for the device's safe and effective operation¹. Electromagnetic interference refers to presence of undesirable radiation obstructing the smooth functioning of nearby electronic circuits. Sometimes electromagnetic interference is used constructively for jamming network signal in case if an agency is dealing with criminals.

Most of the electronic devices in the present world are based on wireless transfer technology which indirectly emits some radiation i.e., electromagnetic radiation into the nature. It is present in low frequency, yet they are potentially carcinogenic. This truly represents that with evolving technology we are not only bringing in new innovations but also indirectly driving in some effects due to it. If at all this frequency increases drastically it will affect humans and living creatures' life on this earth. We visited few places in Bangalore, where we measured the electromagnetic radiation in the given area. The electromagnetic radiation was measured at these places which turned out to be less than the threshold as given by WHO (World health organization) which is safe. Figure 1 shows the map of the study area.

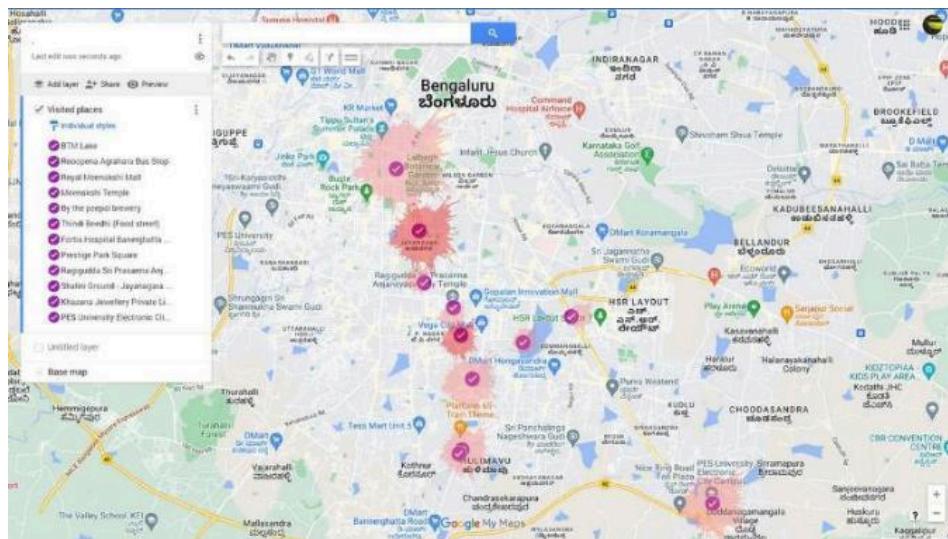


Fig 1 Map of the study area

MATERIALS AND METHOD

In our environment, Electromagnetic radiation (EMR) can be ranging from very short to long wavelengths. In the case study that we've worked upon, we have recorded the EMR that is radiated and tried to check the effect of different EMR emitted by the electronic devices on the environment. From various signals found in our environment, most of it is found to be modulated communications signals, interference events, and pulsed tactical signals- making it impossible to detect the signal by a normal device. Modern day electronics and future communication devices having complex modulations, larger spread of the

spectrum pulsed, and coherent radio techniques increases the challenge of detection with the present techniques in normal EMI detectors. Also, to inspect and interpret the standard and test the features of these communication signals, we need some kind of processor to promptly process and store these values to differentiate with the signals generated over time t and this process should be instantaneous in nature. A real-time spectrum analyzer shows the EQ spectrum in real-time, or right as it's happening. In RTSA or Real-time Spectrum Analyzer, Fast Fourier Transforms are drawn upon to apprehend and acknowledge the type of EMI signal in real time, meaning that the operating speed of the gadget is parallel to that of the real systems that is simulating and has a probability of intercept is equal to 1 despite exceptionally dense environments.

In our project, we have made use of the device ‘Tektronix RSA306 real-time spectrum analyzer’ and along with it used the software ‘Signal Vu-PC™ software offered by Tektronix besides providing the device. The RSA306 makes use of the computer/laptop and Tektronix SignalVu-PC™ RF Signal Analysis Software to come up with instantaneous spectral analysis, streaming capture, and deep signal analysis capabilities for signals from 9 kHz to 6.2 GHz, everything being economical, compact, and convenient portable package that is best suited for field, factory and scholastic utilization.

The RSA306 exercises with SignalVu-PC, a potential program that is the basis of Tektronix efficiency signal analyzers. SignalVu-PC provides scrutiny which wasn't formerly cost-effective. Real-time operation of the DPX acquisition technology is authorized in the PC, additional minimizing the cost of hardware to a greater extent. The RSA306 and Signal Vu software is as shown in figure 2.

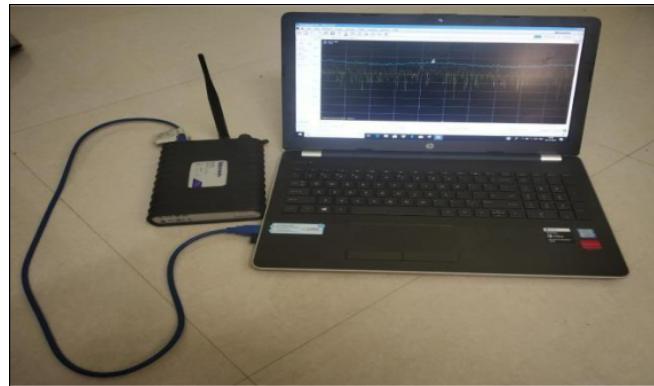


Fig 2. RSA306 and Signal Vu software

RESULT AND DISCUSSION

The measured average electromagnetic radiation in different location of the study area is shown in figure 3. The real time EMI readings in Bangalore and snippets of reading from the RTSA signal analyzer as shown in figure 4.

The safe guidelines as put out by WHO (World Health Organization) in the year 2020 for larger RF Electromagnetic field range from 100 KHz (kilohertz) to 300 GHz (gigahertz). After taking readings across multiple places the minimum value stands at 1.71 GHz and the maximum stands around 1.75 GHz which is safe for humans and the living creatures as per WHO issued EMI exposure levels limit²⁻³.

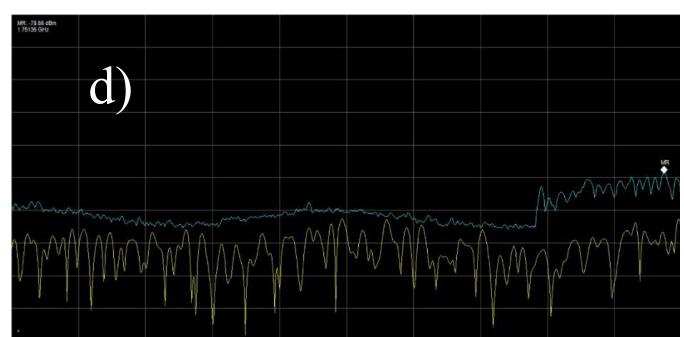
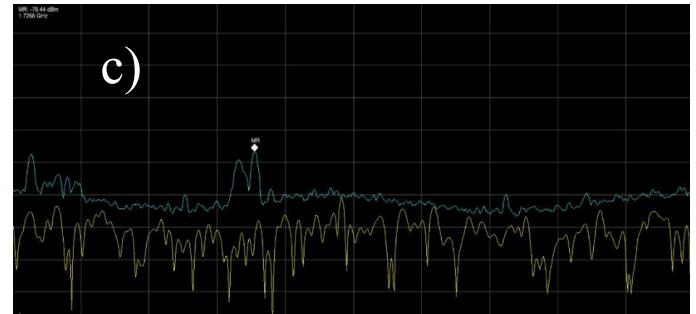
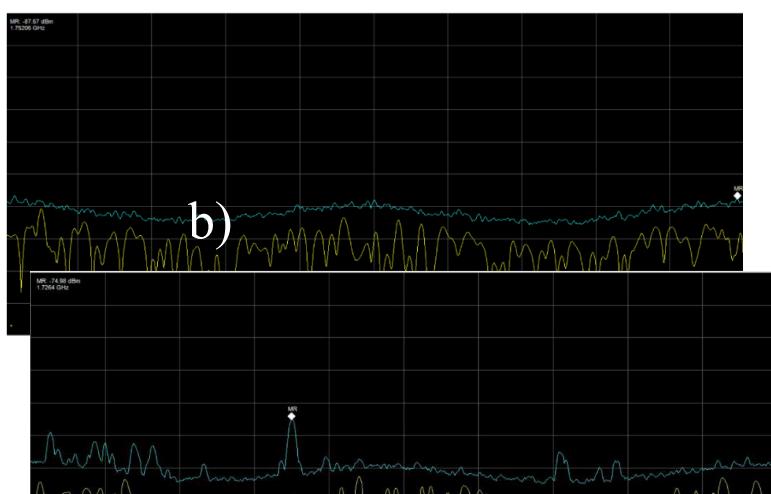
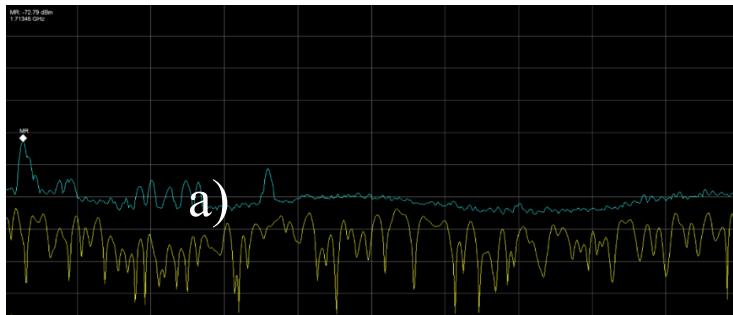
To minimize the effect of electromagnetic radiation we use a popular organic semiconductor like Polyaniline (also known as PANI). PANI is an organic polymer that can be used as a conducting polymer. Its property is acquired by appropriate doping. PANI can adsorb heavy metals of different electrical charge by electrostatic attraction because its surface charge can be altered by doping/cleaning. Moreover, it can adsorb heavy metals by

other mechanisms such as Van der Waal forces, pi-pi interaction, hydrogen bonding and chelation⁴.

PLACES	Readings (in GHz)	
BTM LAKE	1.71345	1.71565
BY THE PEEPAL BREWERY	1.7264	1.75205
FOOD STREET	1.7266	1.7266
SHALINI GROUND	1.7237	1.75135
KHAZANA JEWELLERY	1.7136	1.7136
MEENAKSHI MALL(OUTSIDE)	1.7135	1.72995
MEENAKSHI MALL(INSIDE)	1.7264	1.715
MEENAKSHI TEMPLE	1.71345	1.72535
PRESTIGE PARK	1.71655	1.72945
RAGIGUDDA TEMPLE	1.7135	1.75
SILK BOARD BUST STOP	1.72635	1.7268

Fig 3. Readings from places where EMI levels were measured

PLACES	Readings (in GHz)
Lalbagh	2.38665
Basavangudi (Corner House)	2.419375
PESU ECC Cricket Ground	2.39975
PESU ECC Classrooms (with mobiles)	2.422675
PESU ECC Classrooms (without mobiles)	2.3876
Vega City Mall	2.3985



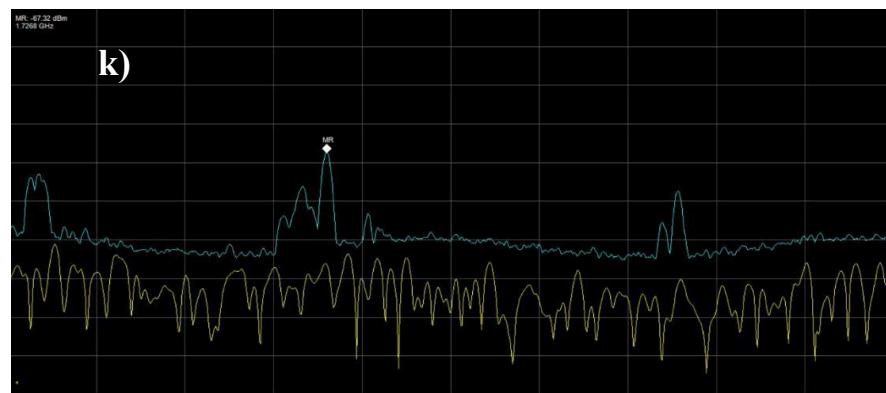
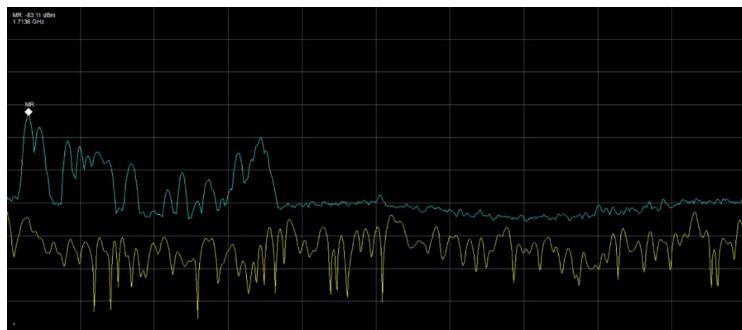
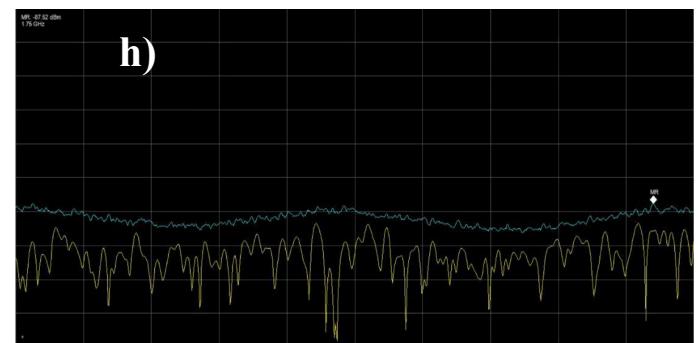
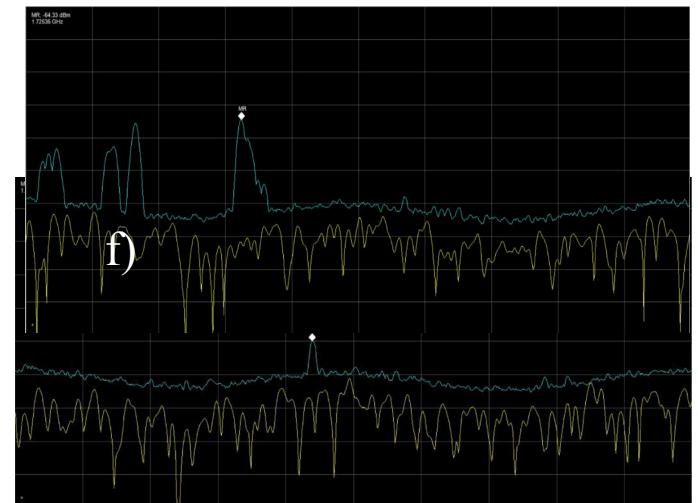
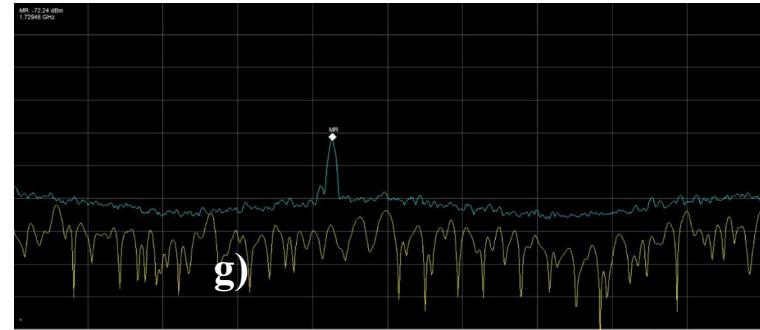


Fig 4: Snippets of reading from the RTSA signal analyzer a) BTM LAKE, b) BY THE PEEPAL BREWERY, c) Food Street, d) Shalini ground Jayanagar, e) Khazana Jewellery Jayanagar, f) Meenakshi mall (outside), g) Meenakshi mall (inside), h) Meenakshi Temple, i) Prestige Park, j) Ragigudda Temple, k) Silk Board Bus Stand

CONCLUSION

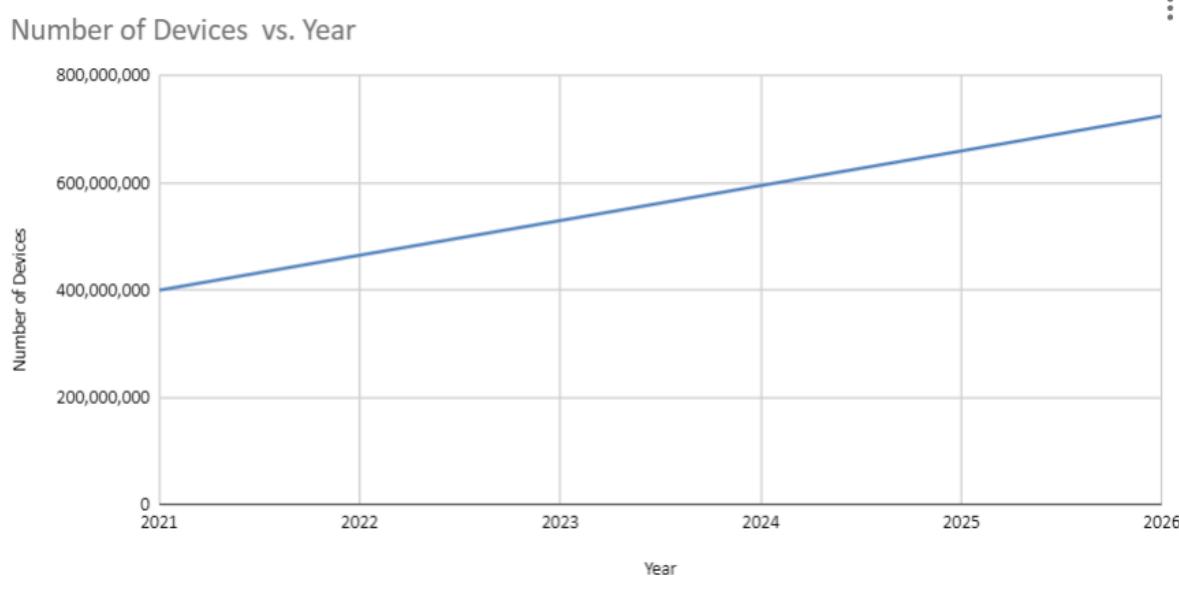
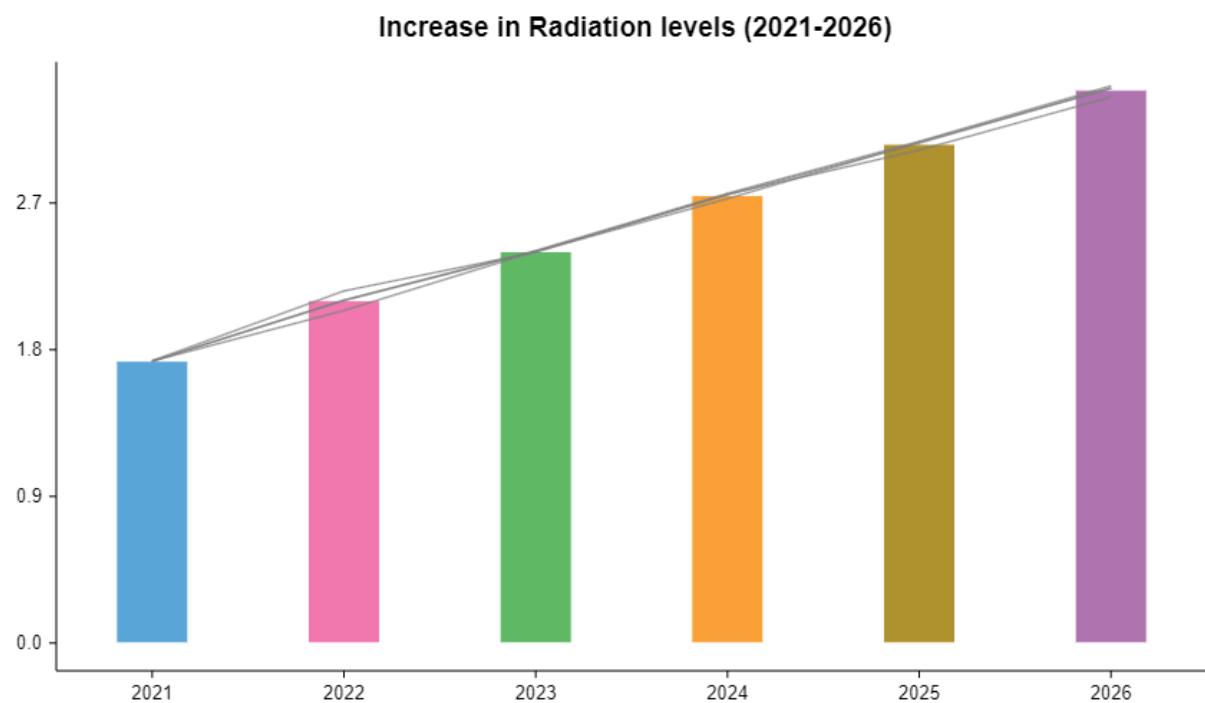
Since we made use of RSA 306 Real Time Spectrum Analyzer by Tektronix it was easier to take the real time readings. Now that we are slowly upgrading our devices and network for easier and efficient communication to 5G it emits higher band radiation than the former (4G). But these changes have subtle effects yet impactful on the living creatures.

During our research, even with the presence of a wide variety of polymers, only selected ones are able to counter electromagnetic radiations, especially PANI. There is no conclusion drawn on why PANI can obstruct electromagnetic waves better than any other conducting polymer, since it's only an observation. Understanding the correlation of physical/chemical properties with conductivity for PANI is difficult to determine as it depends on its state to state

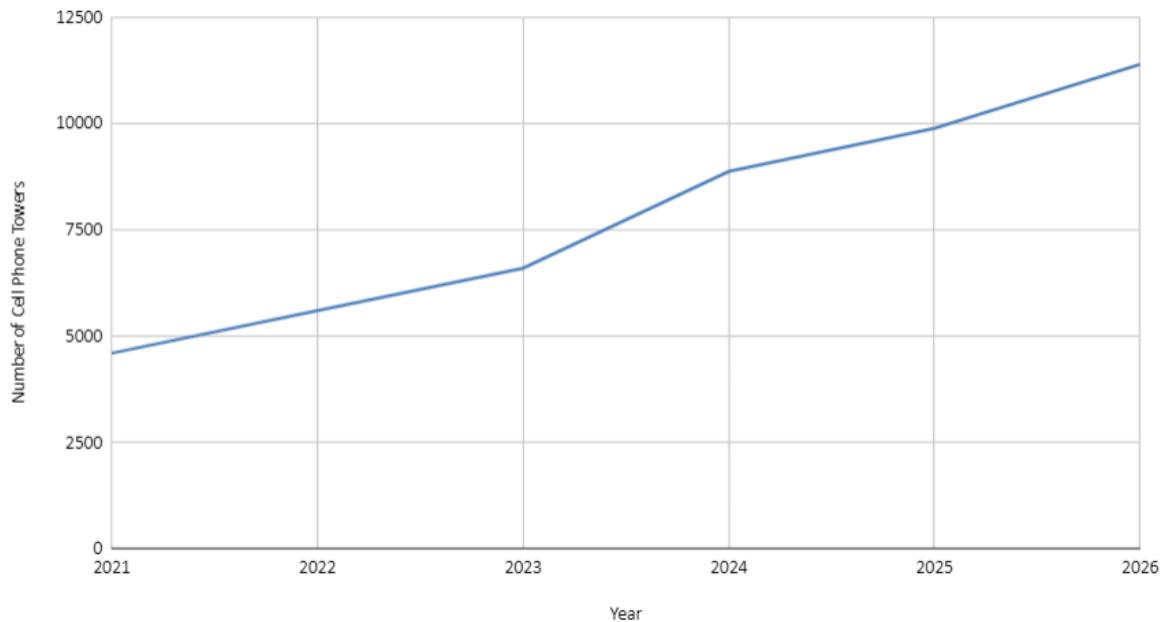
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3. Manoj V, Naveen Kumar A, Revanasiddappa M, "EMF Pollution – Causes, Effects and Protection (Case study)", Recent Innovations in Science and Engineering - RISE 2016, Conference Proceedings. 30th April 2016
4. Telecom Regulatory Authority of India (TRAI) on Effects of Electromagnetic Field Radiation from Mobile Towers and Handsets" - Information paper No: 01/2014 – QoS

Predicted Values and Statistics :

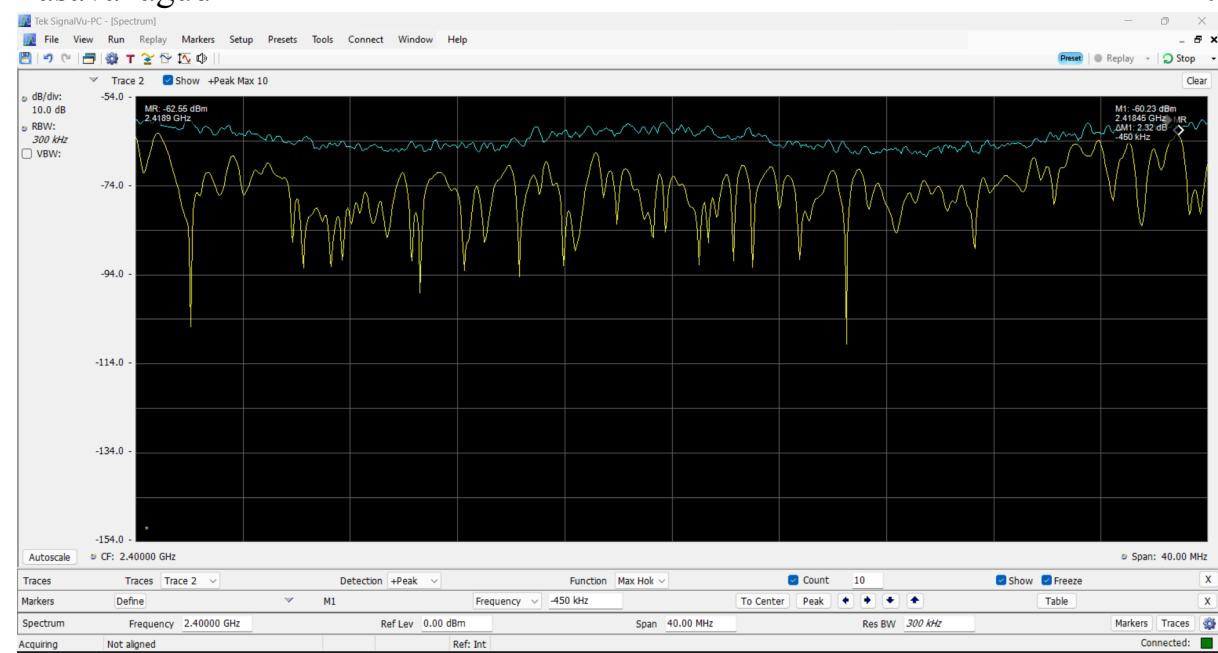


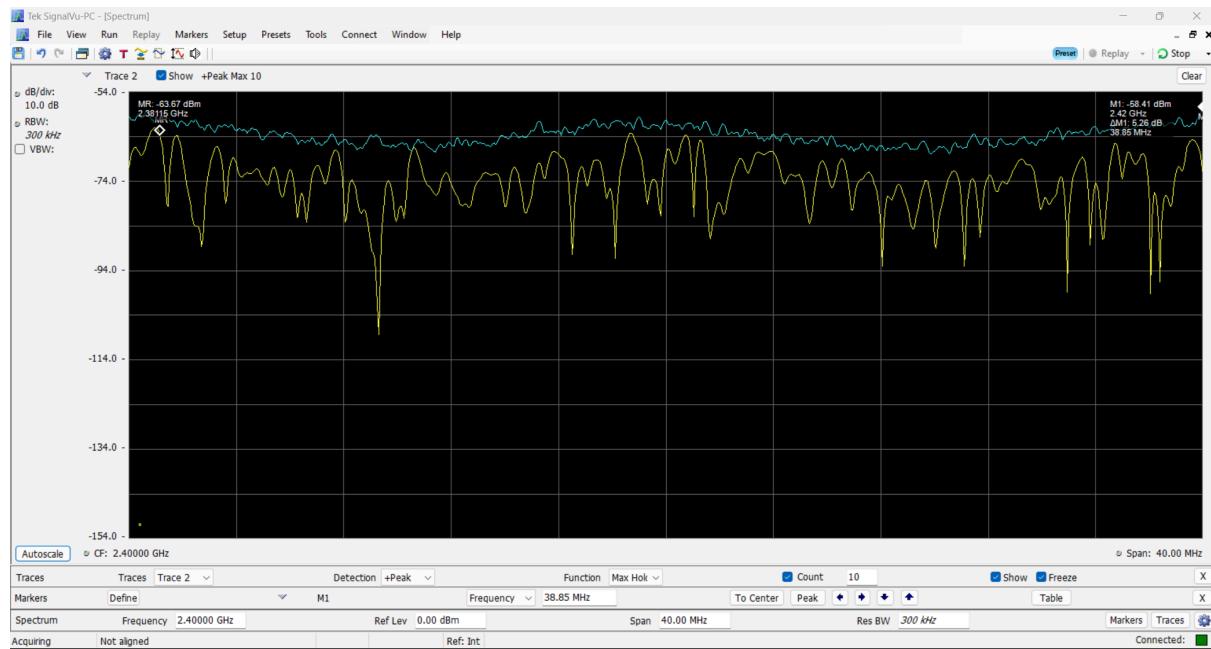
Number of Cell Phone Towers vs. Year



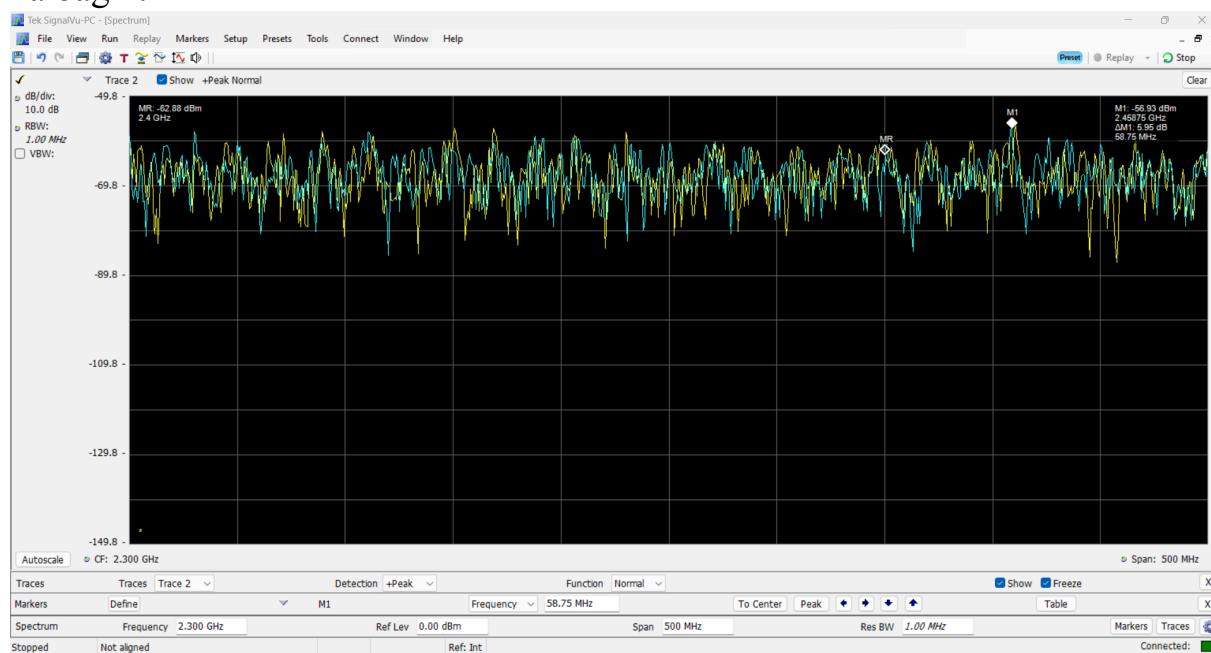
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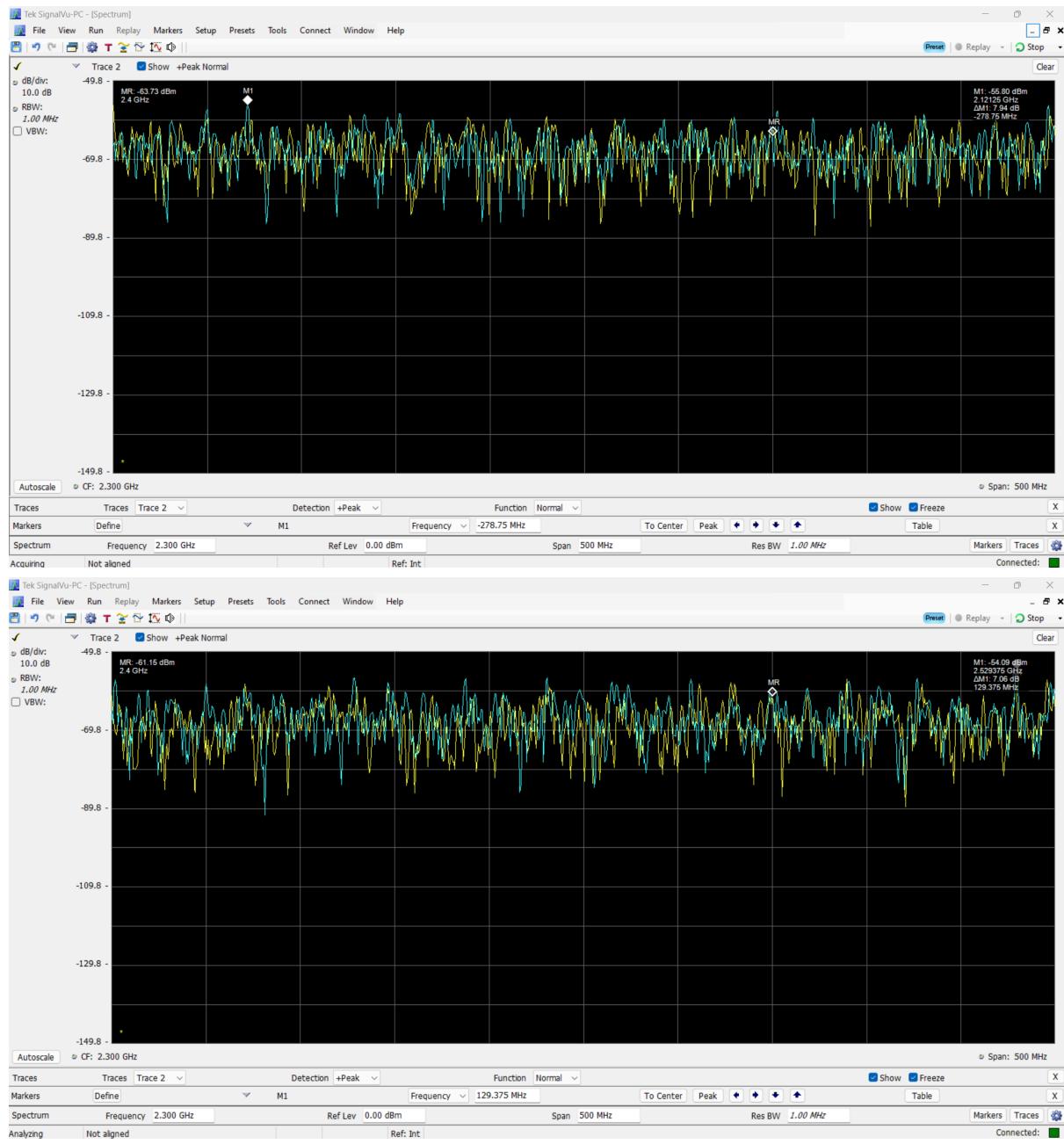
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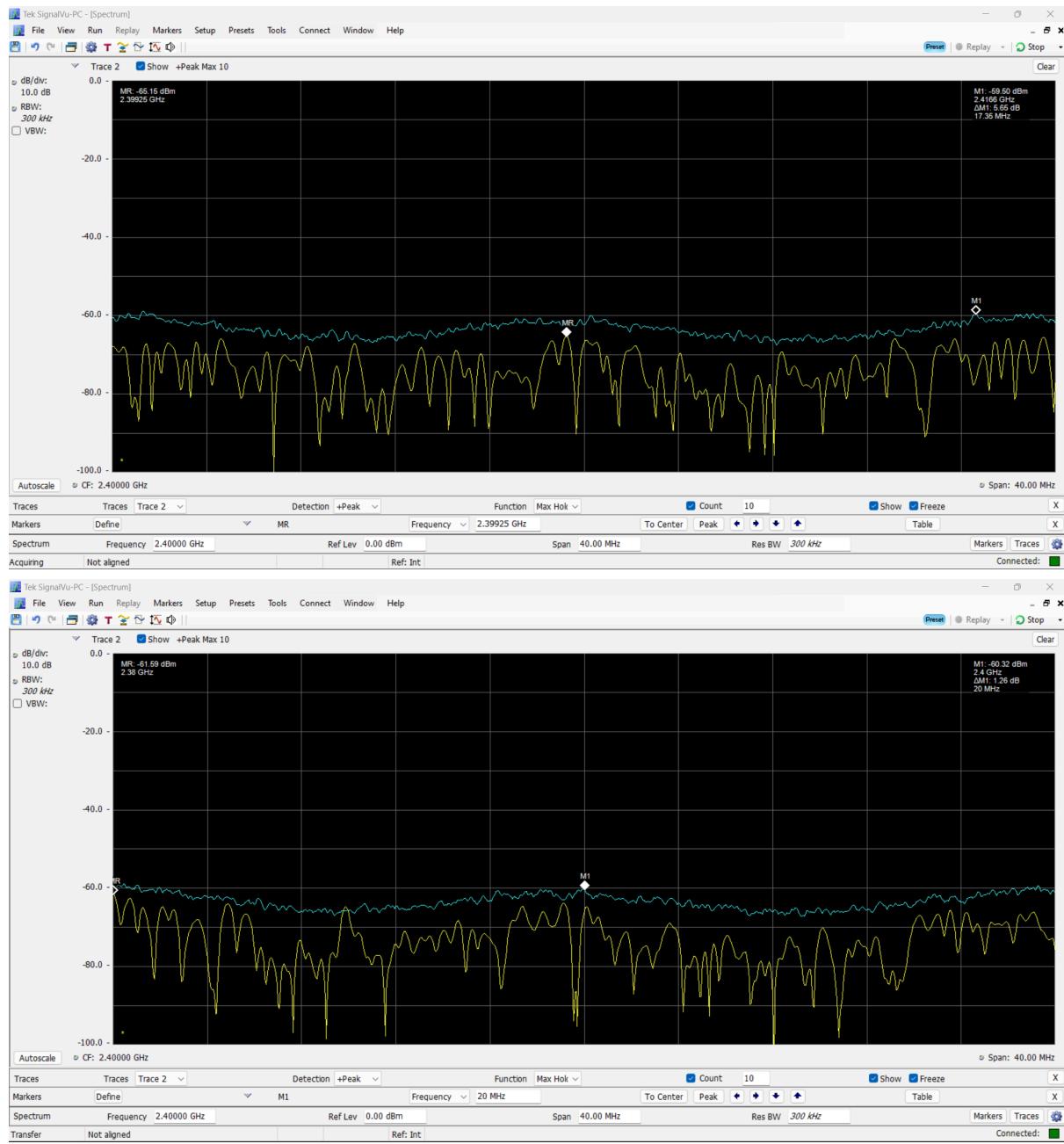


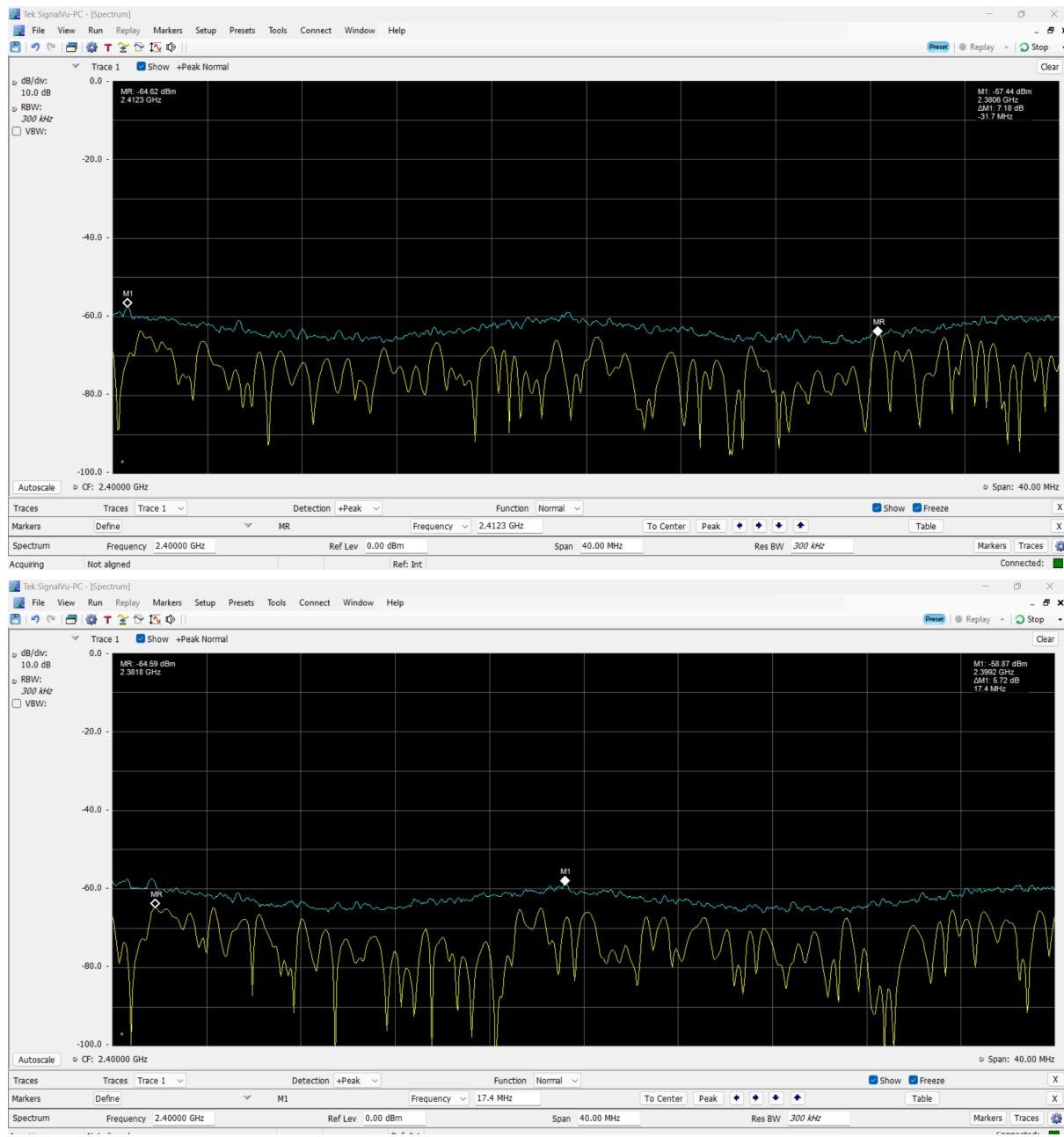


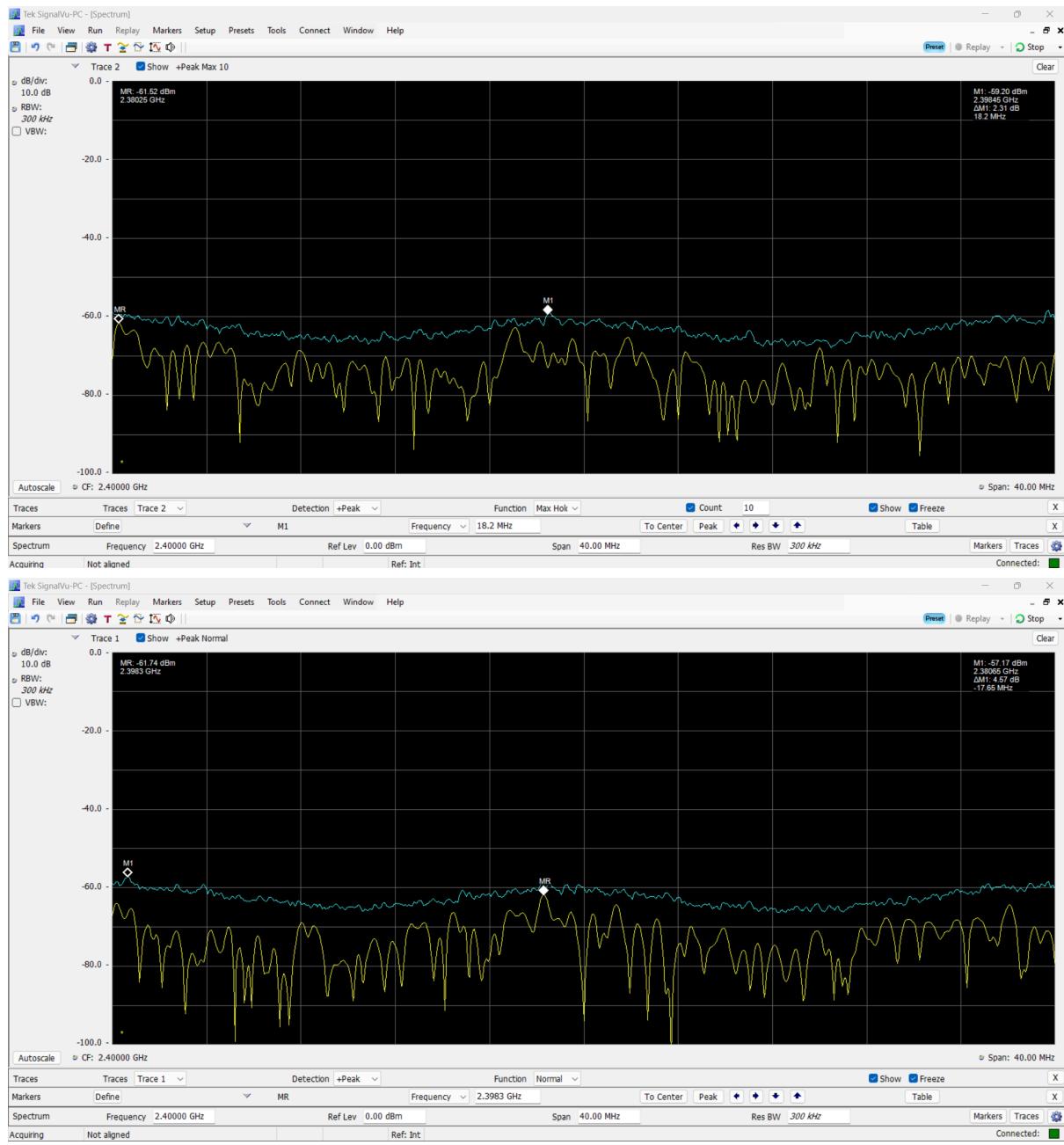
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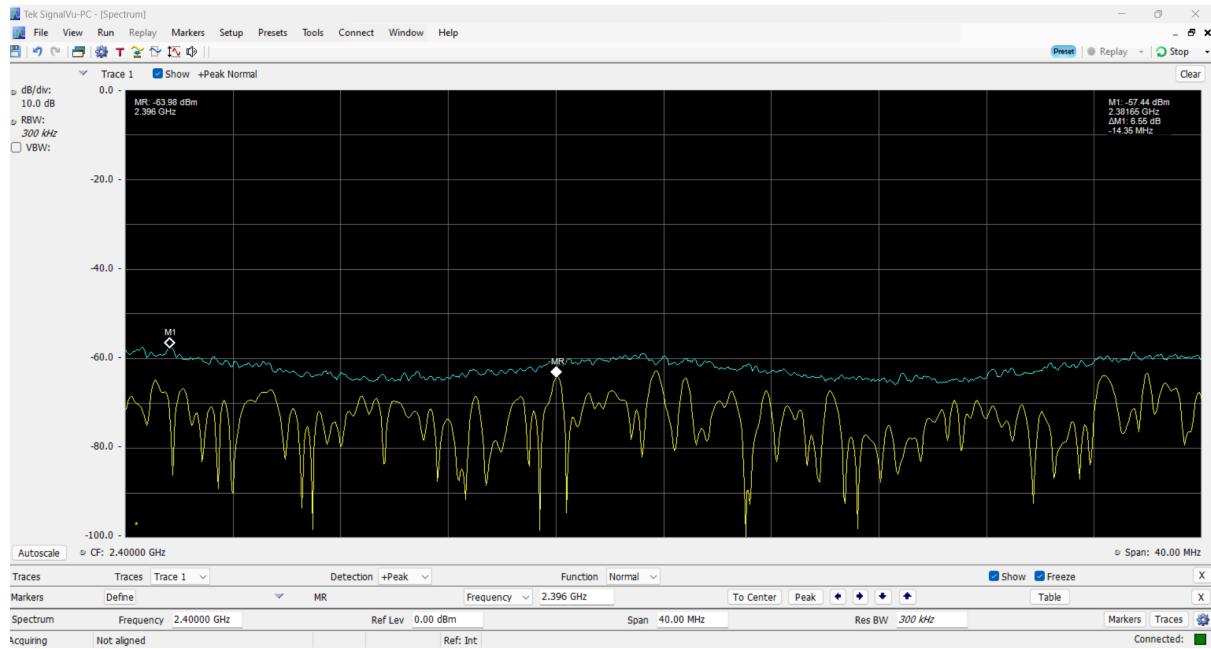




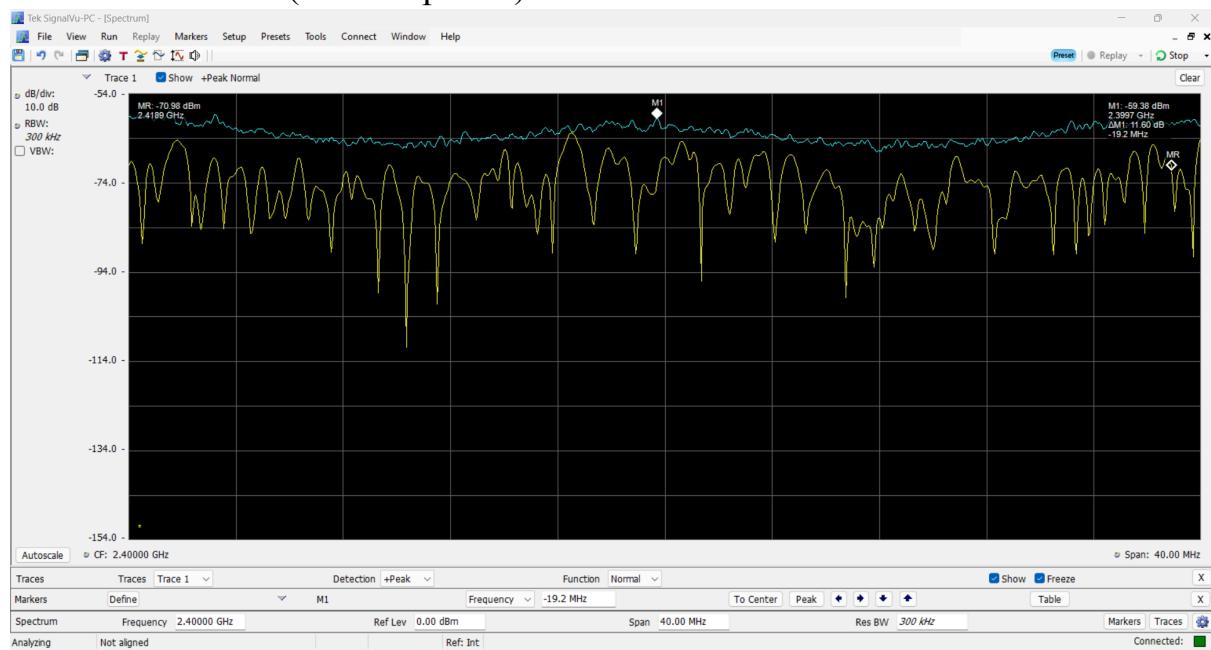


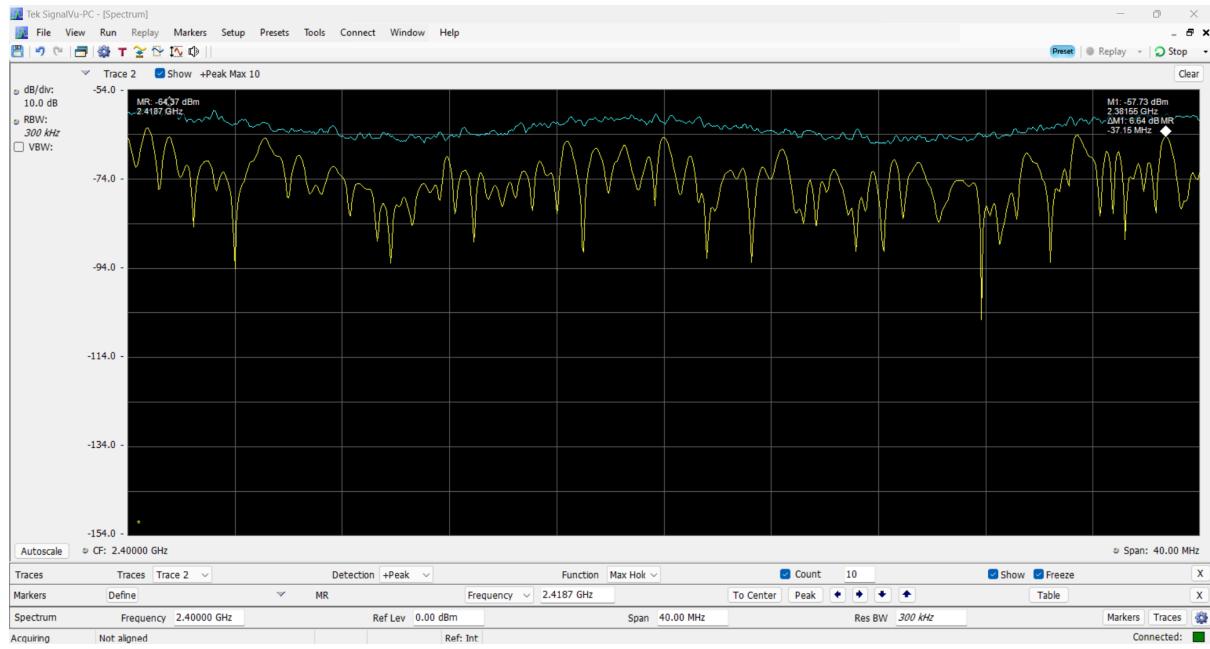




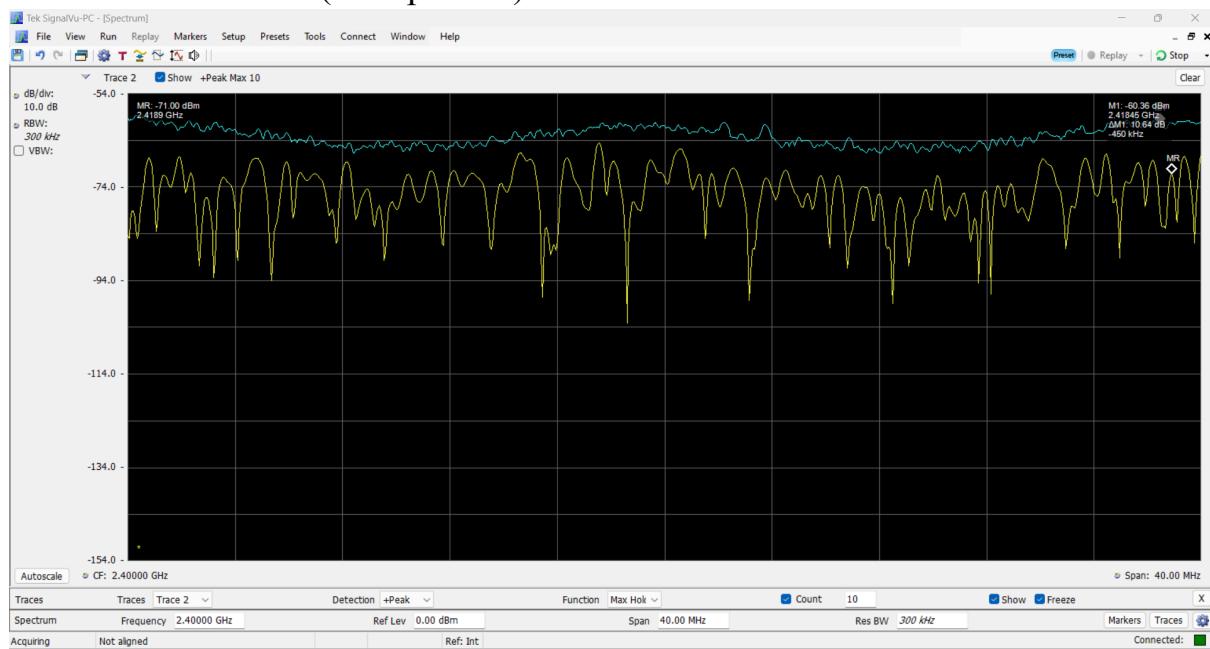


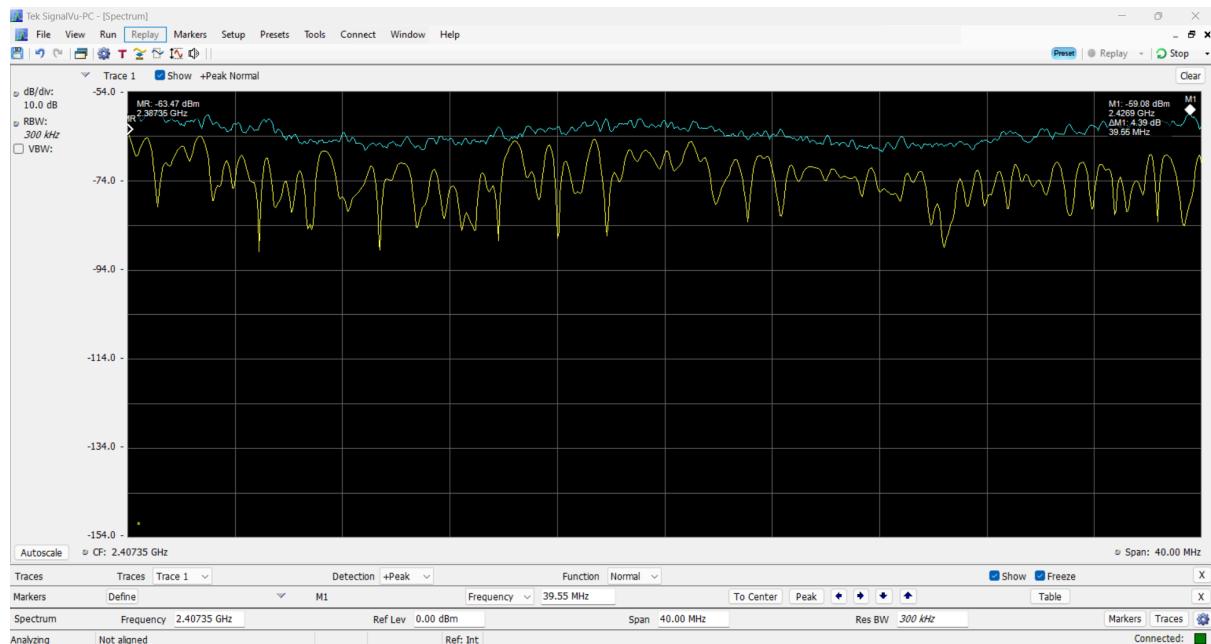
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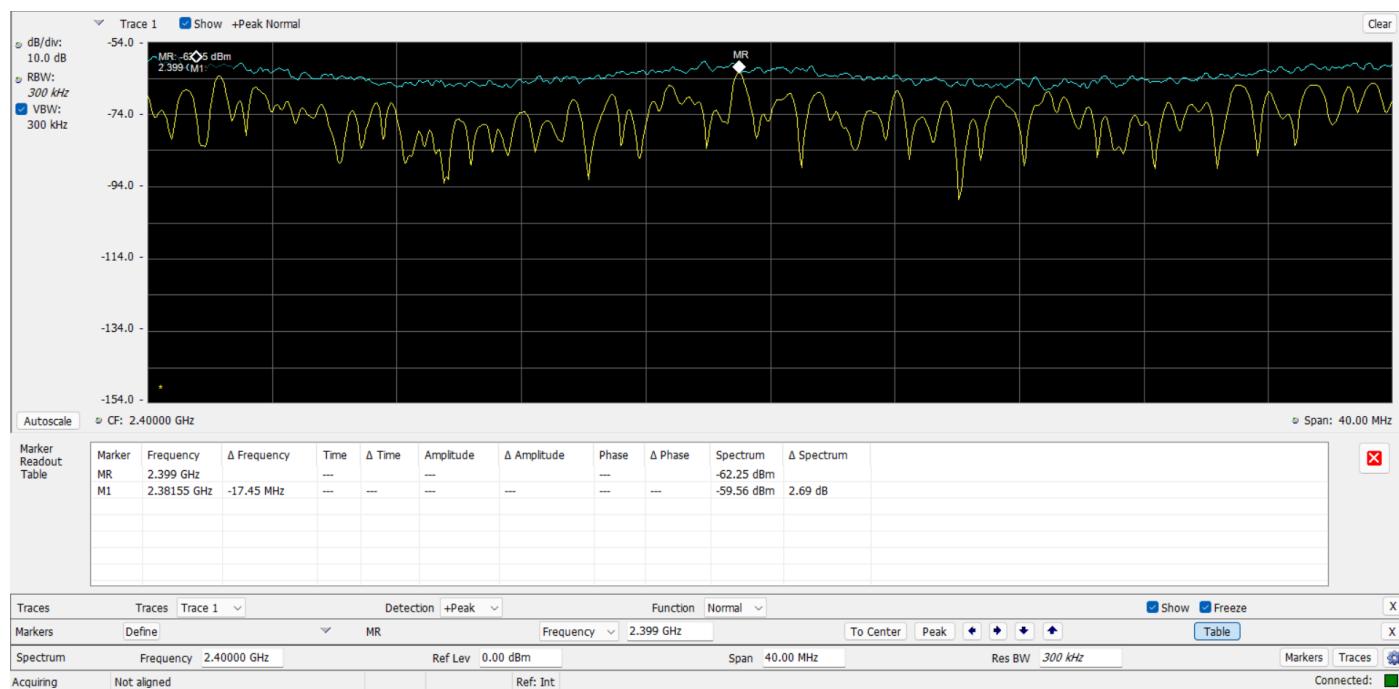


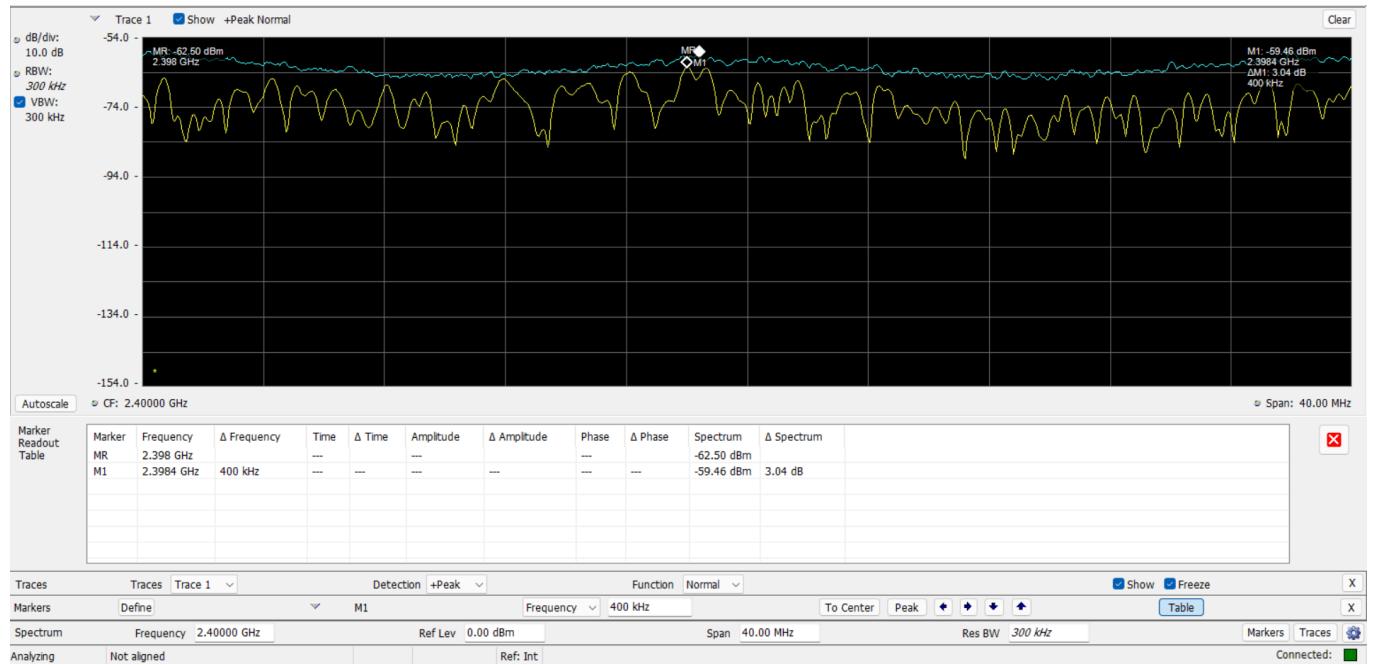
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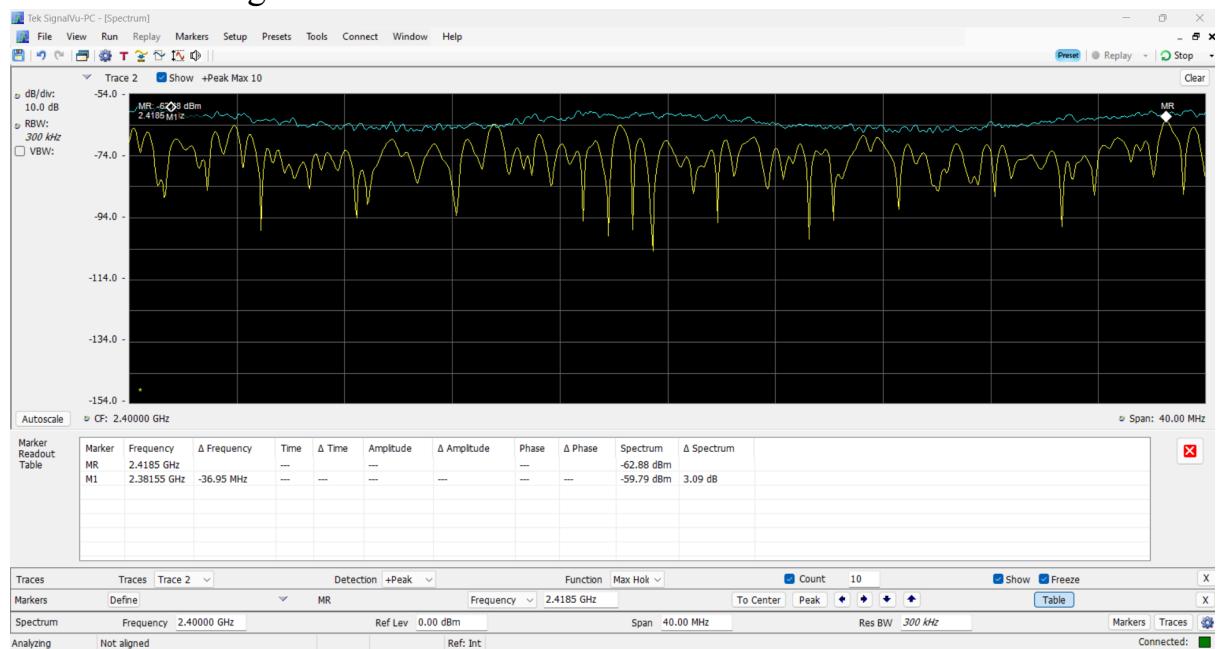


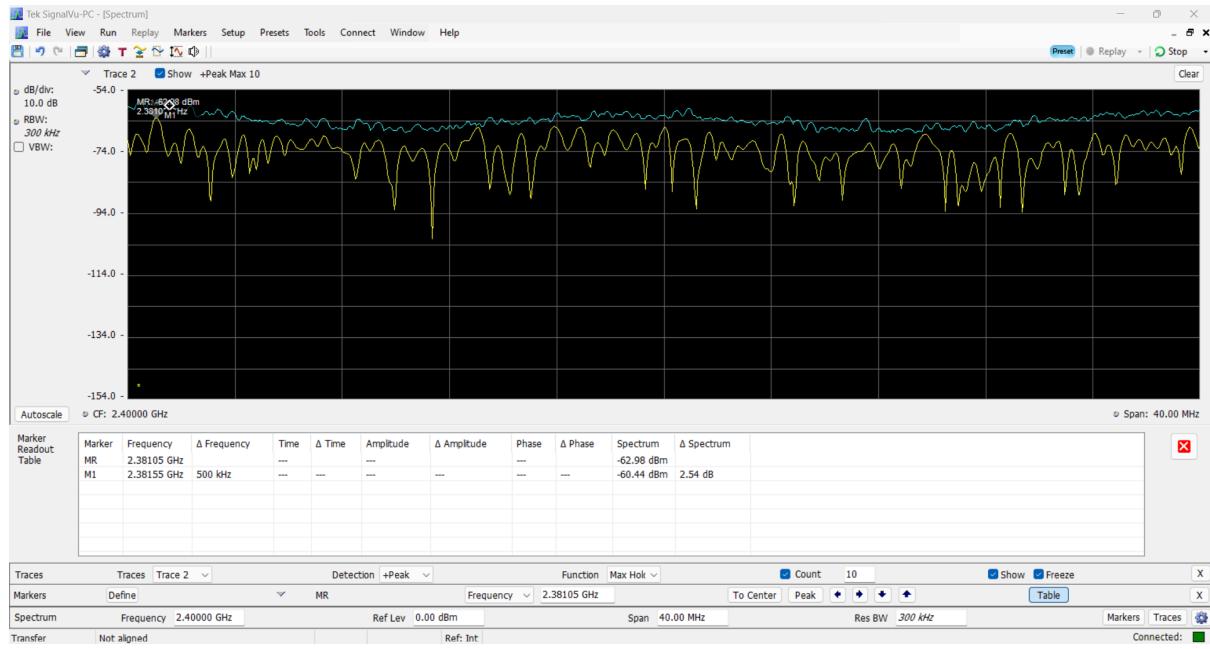
Vega City Mall :





PES EC cricket ground :





MODELLING FOR THE PLOT :

1. Tool used to plot the predictions :
 - a. Google Forecast

2. Working of Google Forecast :
 - a. Linear-Regression:

<https://coefficient.io/how-to-do-a-sales-forecast-with-exponential-smoothing-in-google-sheets#:~:text=The%20FORECAST%20function%20in%20Google,inventory%20requirements%2C%20and%20sales%20growth.>
 - b. .

Simple Linear Regression

Given the observations $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$, we can write the regression line as

$$\hat{y} = \beta_0 + \beta_1 x.$$

We can estimate β_0 and β_1 as

$$\begin{aligned}\hat{\beta}_1 &= \frac{s_{xy}}{s_{xx}}, \\ \hat{\beta}_0 &= \bar{y} - \hat{\beta}_1 \bar{x},\end{aligned}$$

where

$$\begin{aligned}s_{xx} &= \sum_{i=1}^n (x_i - \bar{x})^2, \\ s_{xy} &= \sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y}).\end{aligned}$$

For each x_i , the **fitted value** \hat{y}_i is obtained by

$$\hat{y}_i = \hat{\beta}_0 + \hat{\beta}_1 x_i.$$

- c. <https://blog.golayer.io/google-sheets/google-sheets-forecast>

Radiation pollution and its impact on living creatures in and around Bangalore

1 Prathamesh Devadiga 1 P Chirag Reddy D R 2 Revanasiddappa M, 3 Bhavi Prashanth 3 Abhishek P 3 G Srujana 3 Aadi Sirurmath

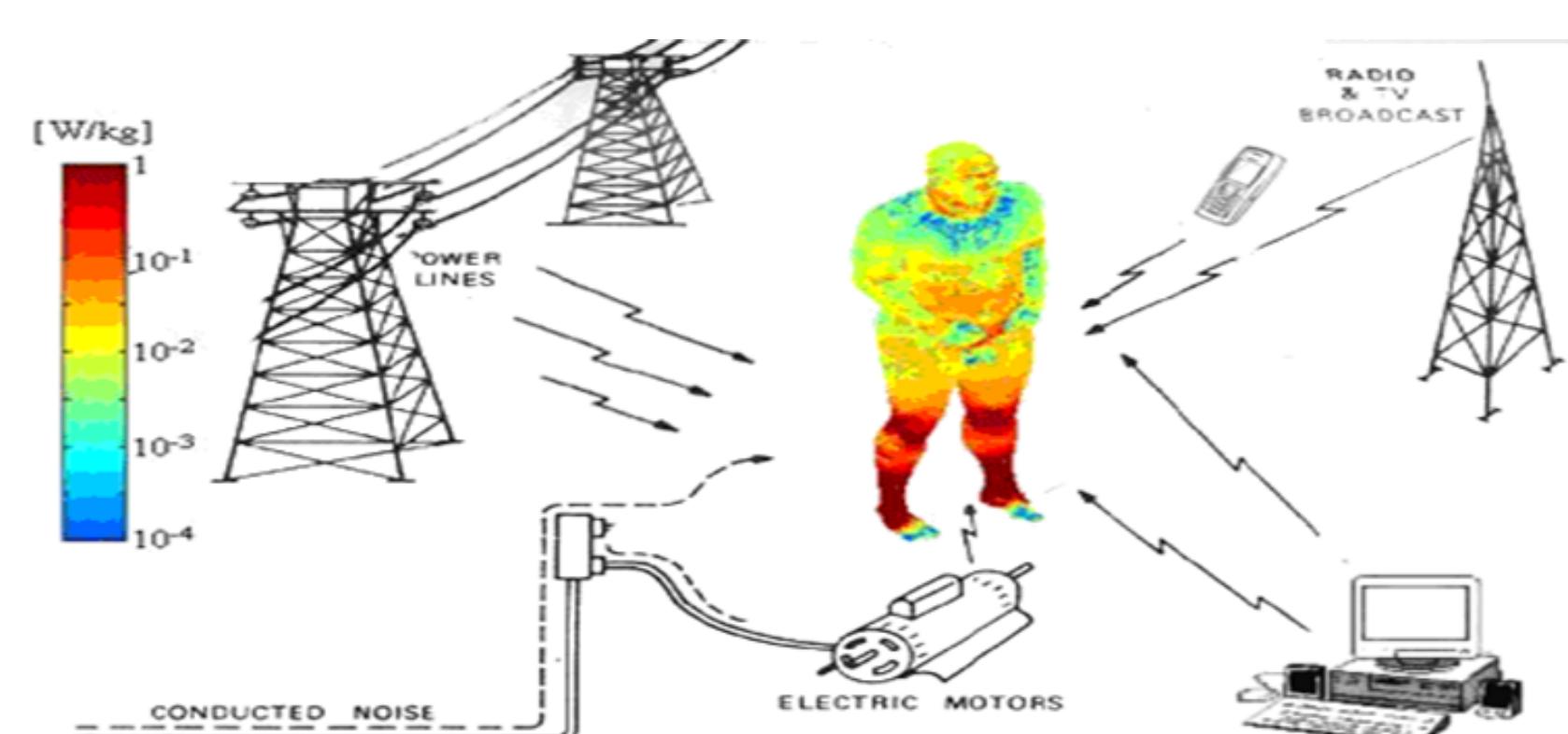
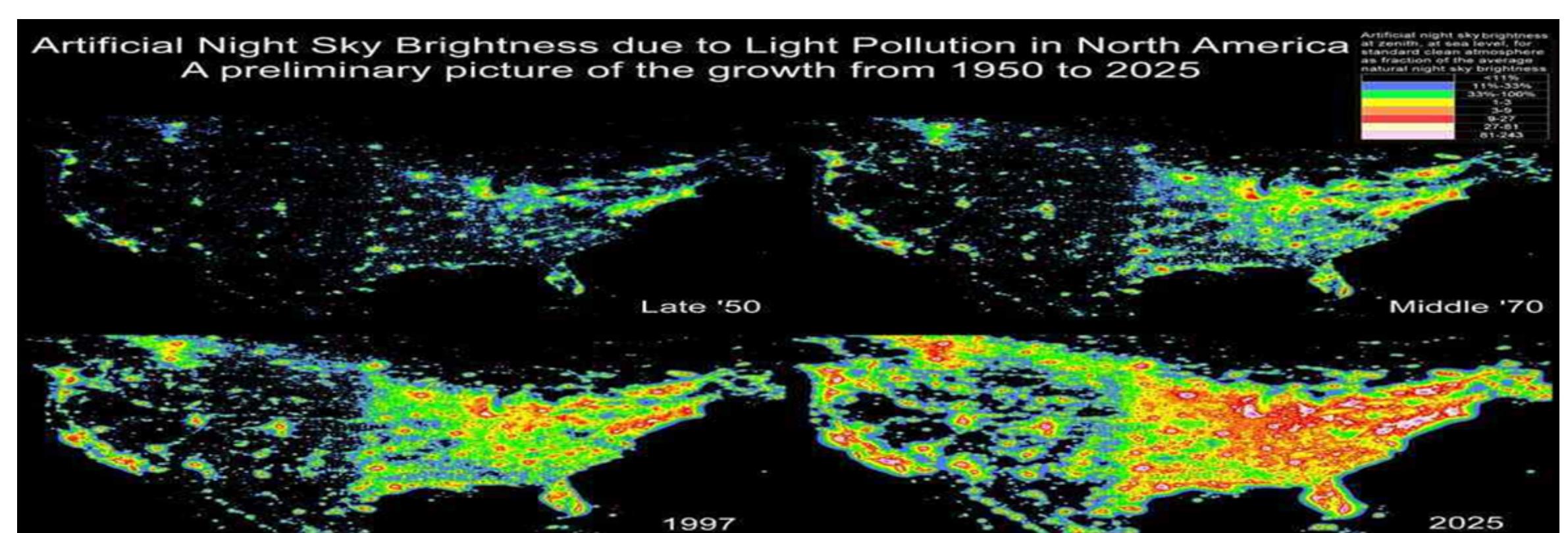
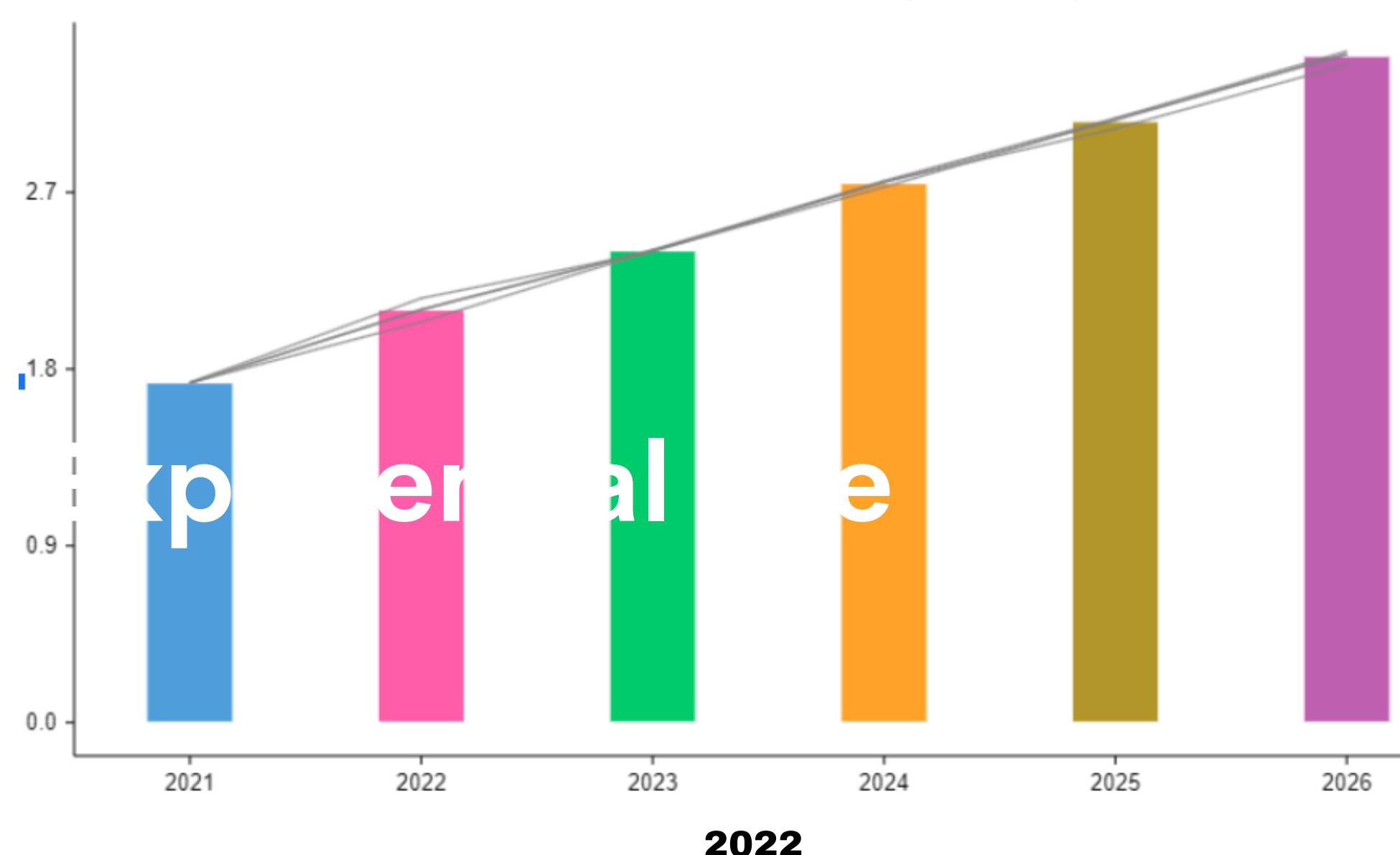
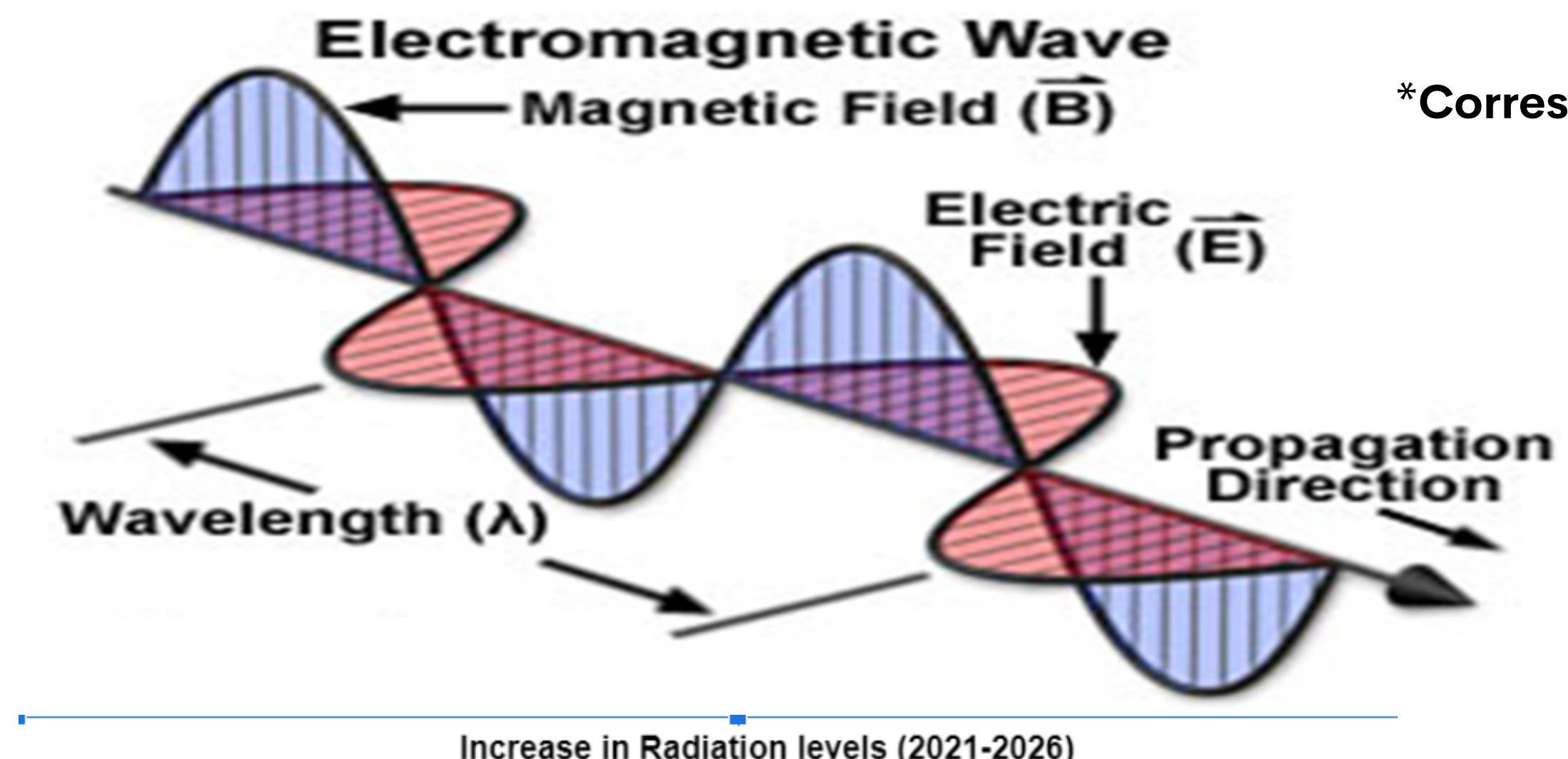
1 Department of Computer Science and Engineering, 2 Department of Science and Humanities, PES University,

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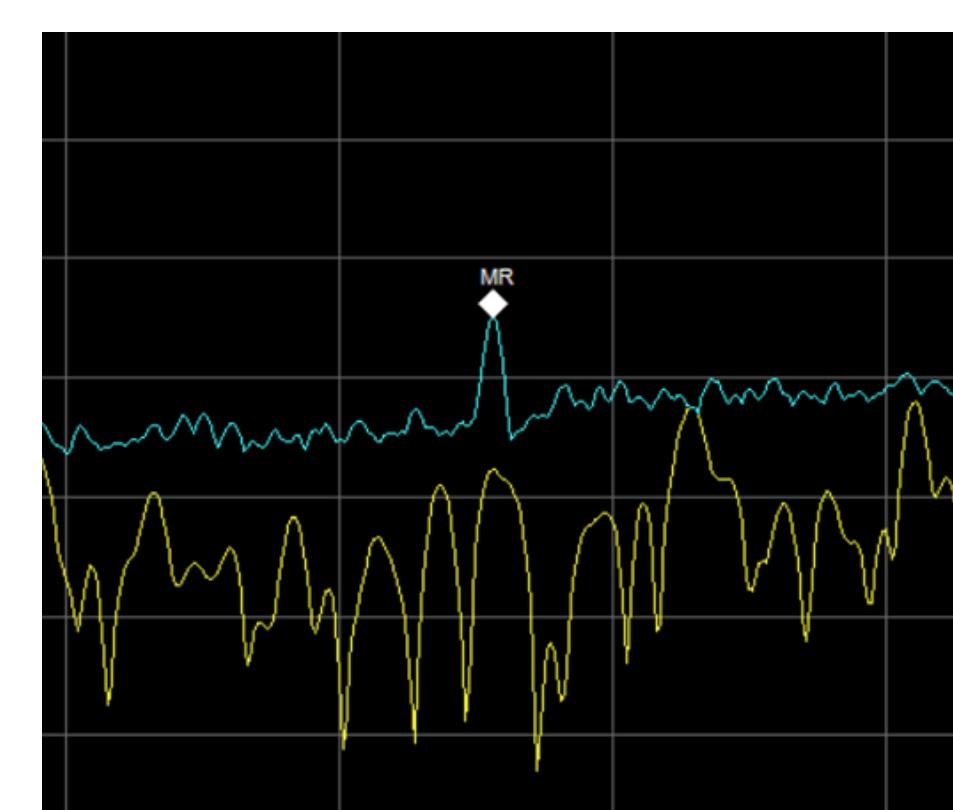
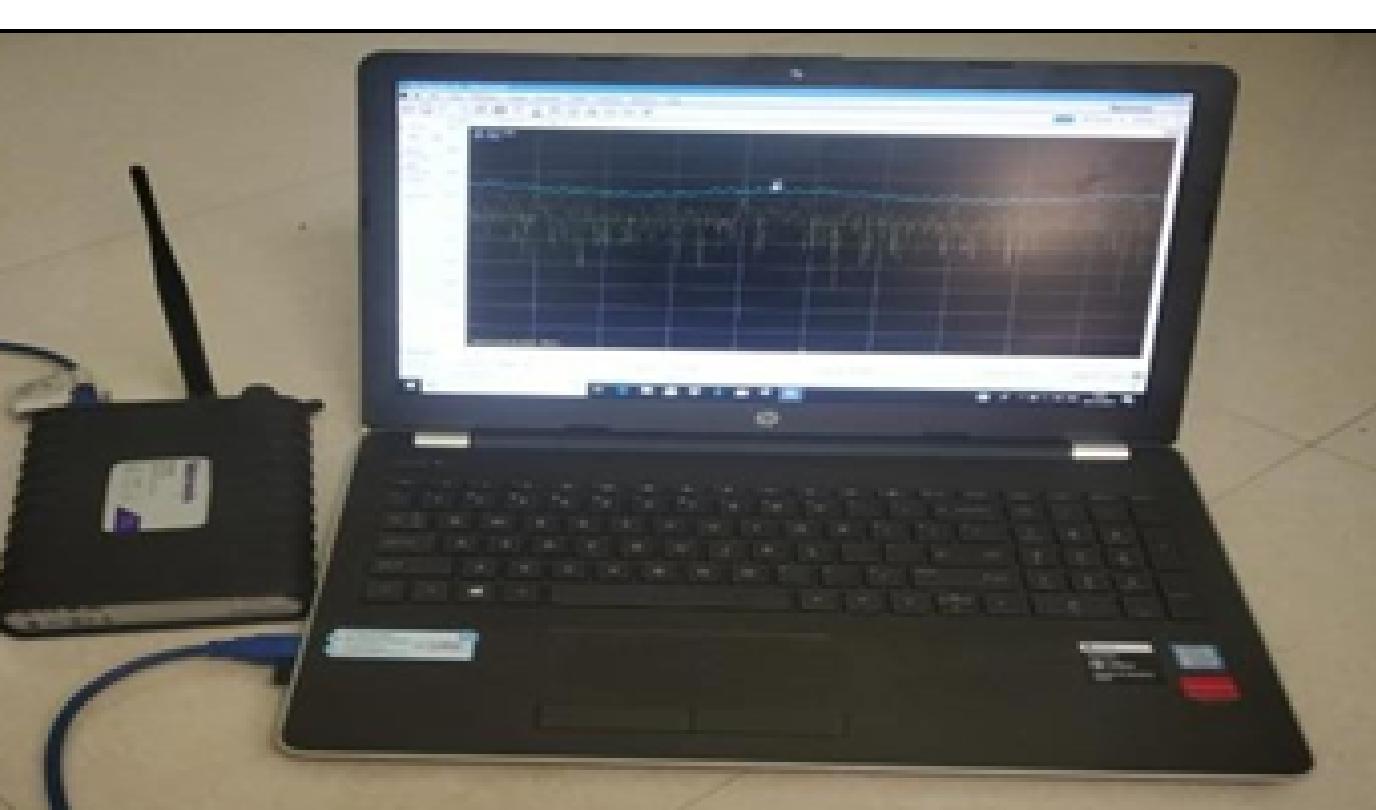
3 Department of Science and Humanities, PES University,

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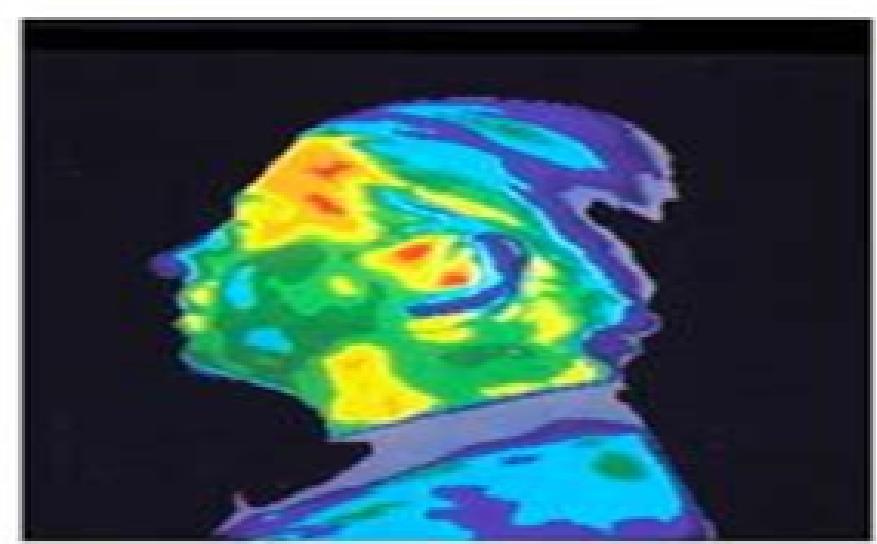


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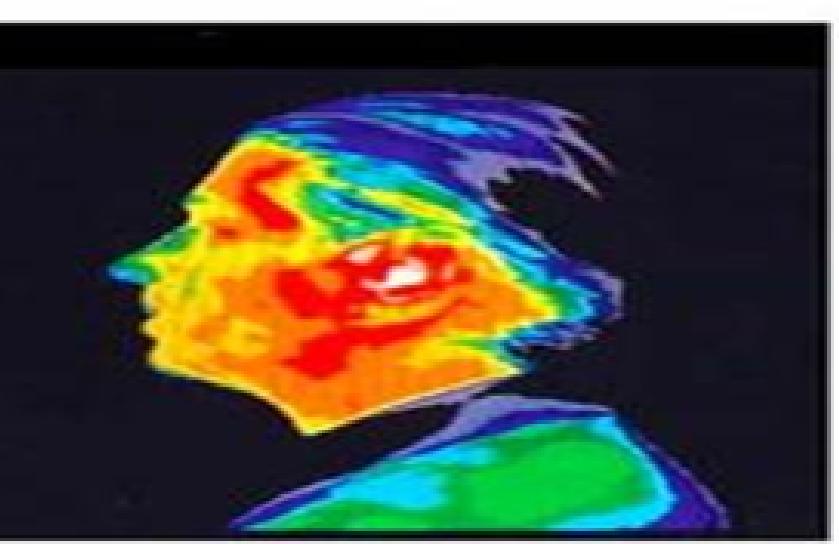


Types of EMI

Intra EMI

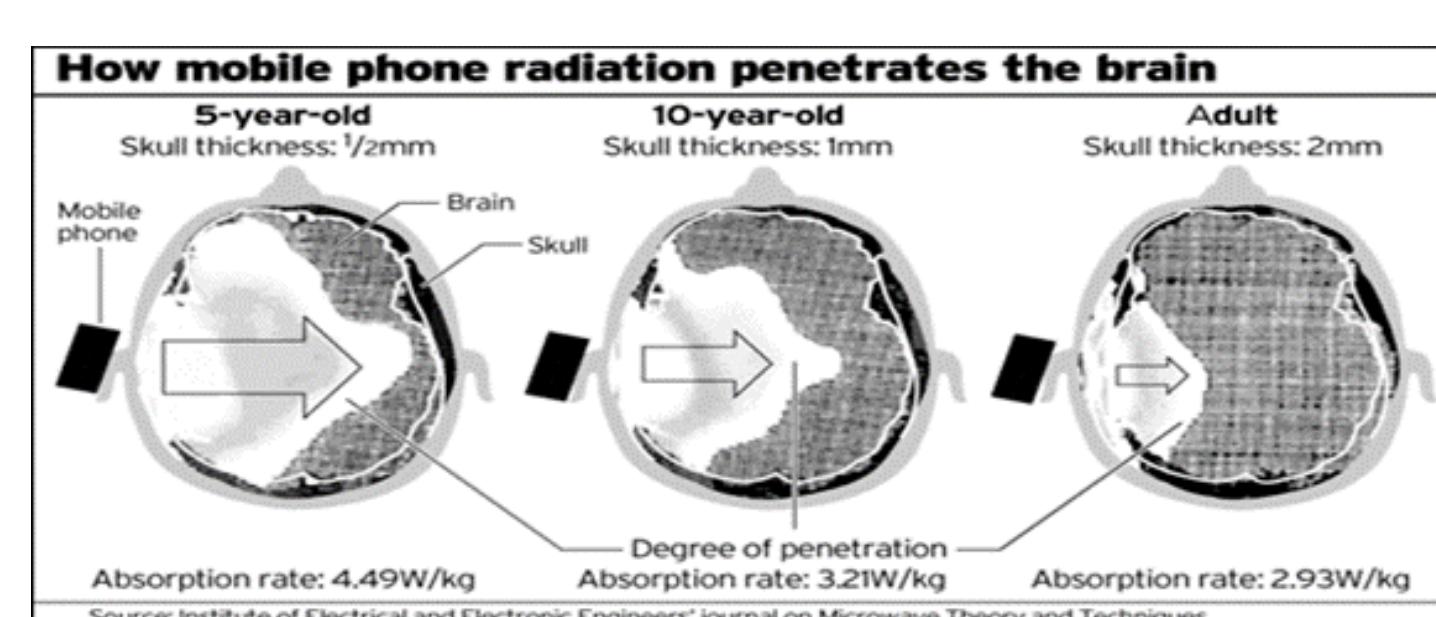
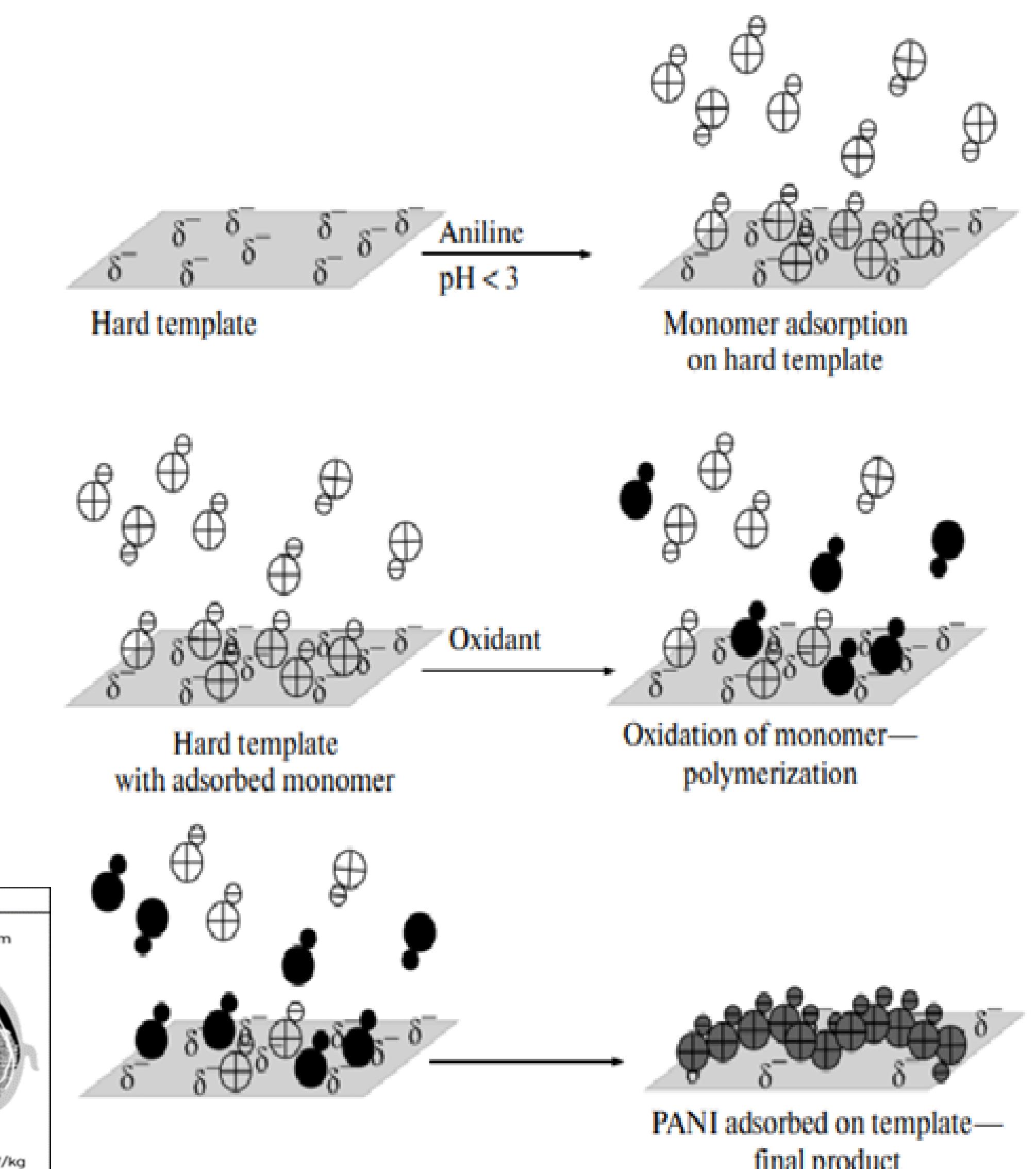
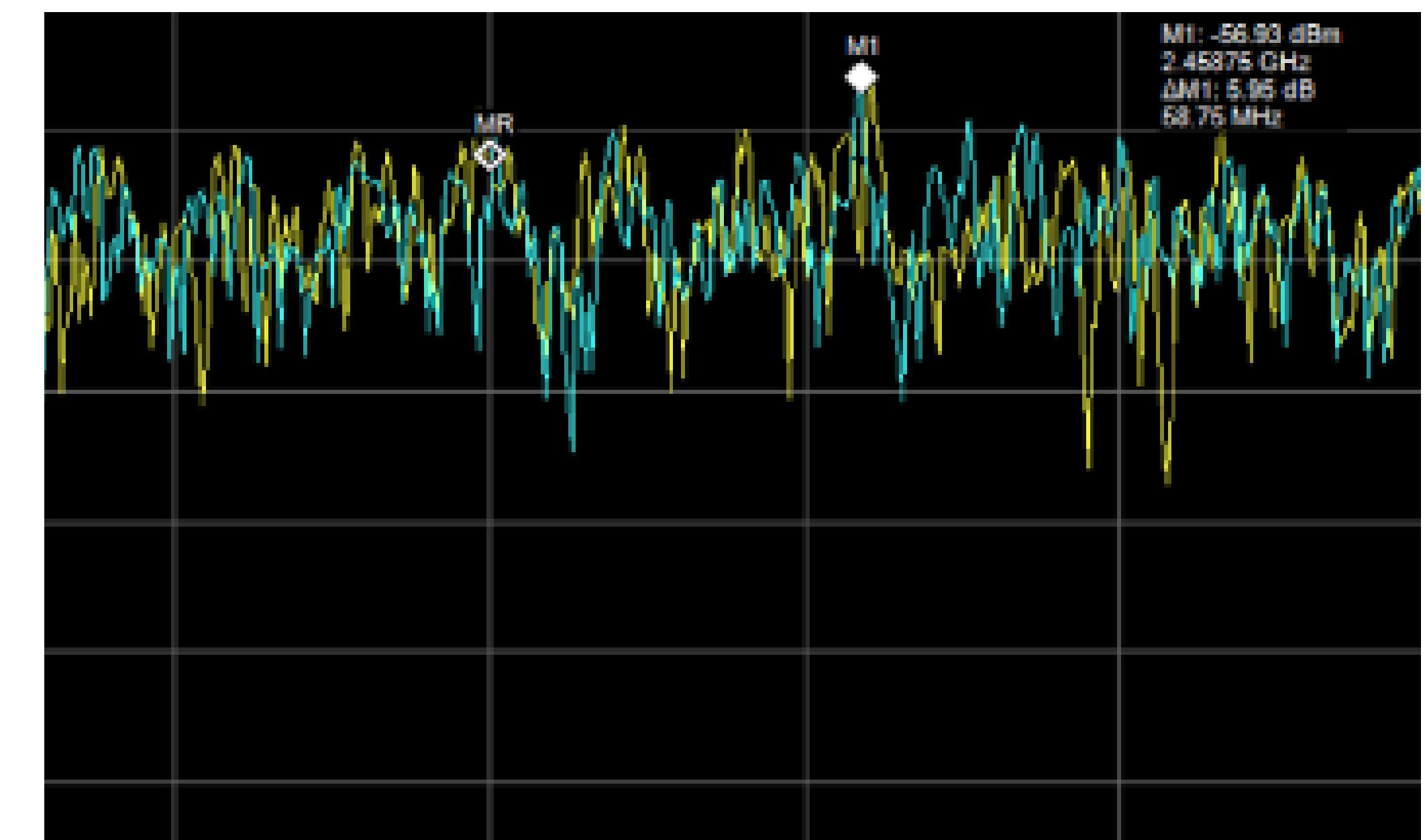


Thermographic Image of the head with no exposure to harmful cell phone radiation.



Thermographic Image of the head after a 15-minute phone call. Yellow and red areas indicate thermal (heating) effects that can cause negative health effects.

Inter EMI



Conclusion

We have also made use of USB-based battery powered RTSAs like Tektronix RSA306 which serves as a fruitful device to measure the radiations emitted in a given region ranging from 9 kHz to 6.2 GHz. This device was beneficial in our radiation hunting applications. We have gathered radiation statistics across eleven locations in Bangalore which could be used to examine and analyze the radiation pollution levels in diverse environments. Based on our research data input, it reveals that the radiation pollution strength (on average across 11 observations is 1.72 GHz) in and around Bangalore is lower than the threshold limit as per the World Health Organization (WHO) that ranges from 900 MHz- 1800 MHz. As of now there are no side effects from the signal to the human beings in and around Bangalore.