International Conference on
Intelligent and Innovative Technologies in
Computing, Electrical and Electronics
27-28 January 2023
BNM Institute of Technology, Bangalore -70

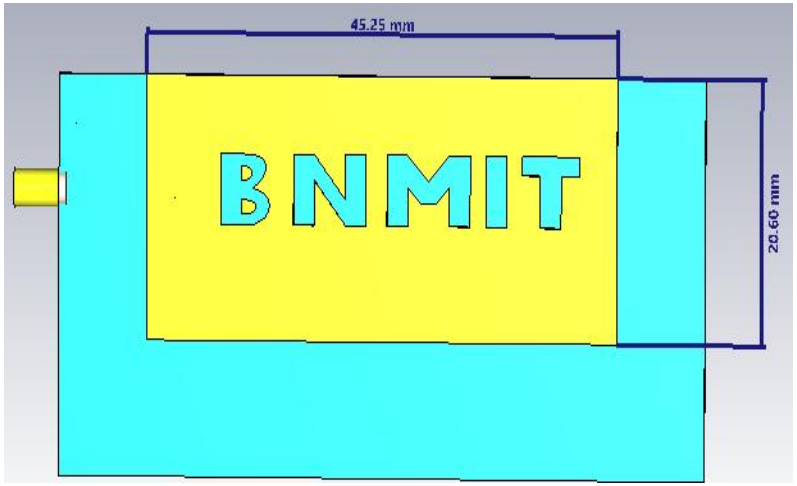
Vidyayāmruthamashnuthe

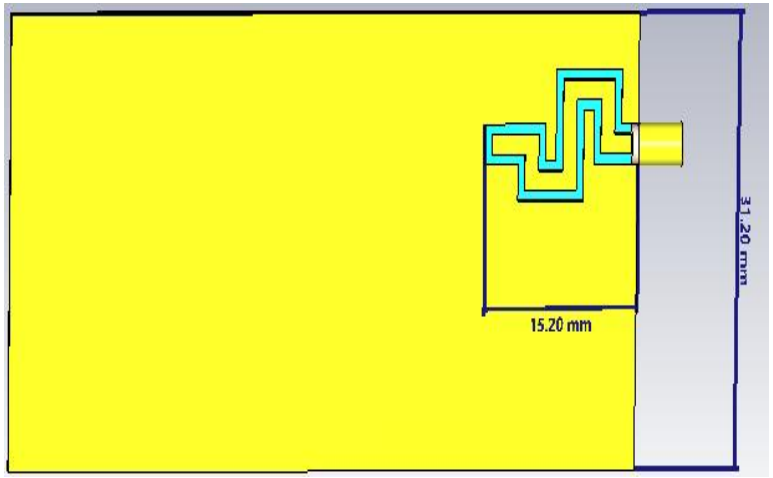
[1236]-Wearable Antenna For Remote Health Monitoring

Authors:

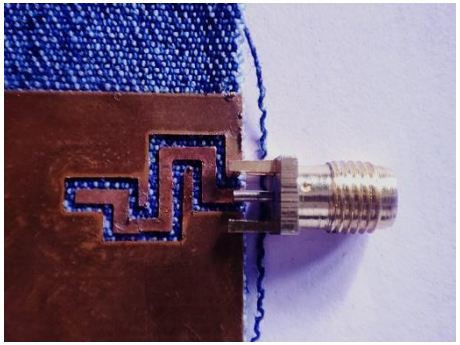
Dr. RekhaP
Prof. Sumathi A
Shisheer S Kaushik
Kiran B
Chidananda S P

Proposed Antenna Design {Denim & FR4 Material}

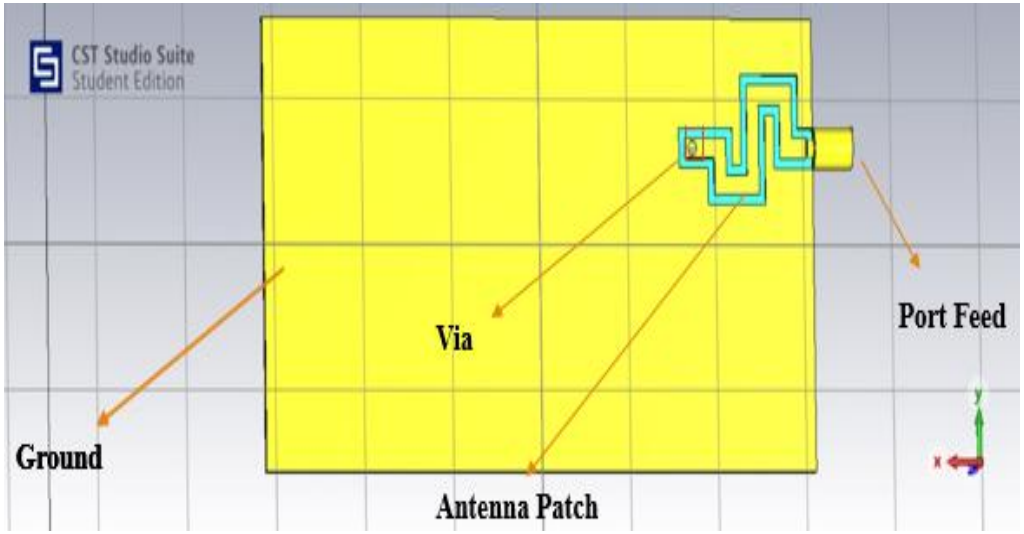


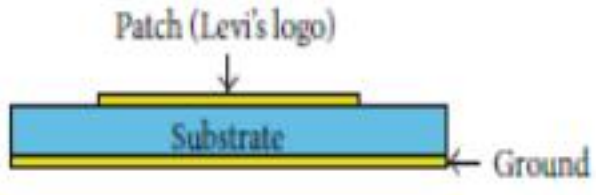


Fabricated Antenna [Denim]



Construction of the proposed Antenna





Physical parameters of the proposed Antenna

Parameters	Denim	FR4 (lossy)
Operating Frequency (f) (GHz)	2.66	2.3
Dielectric Constant (€r)	1.57	4.3
Height of Substrate (h) (mm)	0.5	1.67
Width of Patch (Wp)(mm)	45.25	45.25
Length of patch (Lp) (mm)	20.60	20.60
Width of Ground (Wg) (mm)	60.45	60.45
Length of Ground (Lg) (mm)	31.20	31.20

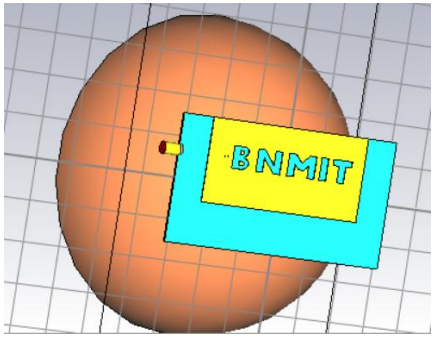
Dimension (mm)	
Denim	Fr4 (lossy)
61 x 31 x 0.8	61 x 31 x 1.97

Phantom Model for SAR Analysis

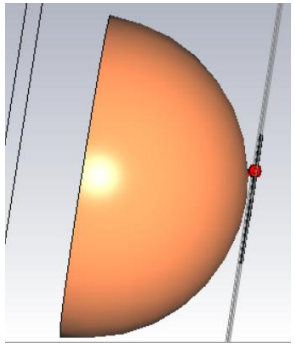
Parameters	Skin	Fat	Muscle	Bone
Dielectric Constant (€r)	34.683	4.9087	47.801	32
Density [Kg/m^3]	1109	911	1022	1058
Thickness [mm]	2.0	6.50	4.0	16.50
Conductivity [S/m]	0.3424	0.32677	5.5818	0.30315

FCC Standard: 1.6 W/ Kg [1g]
2 W/Kg [10g]

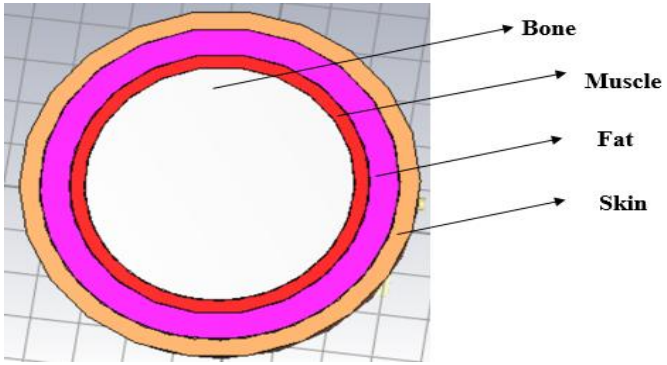
Front View



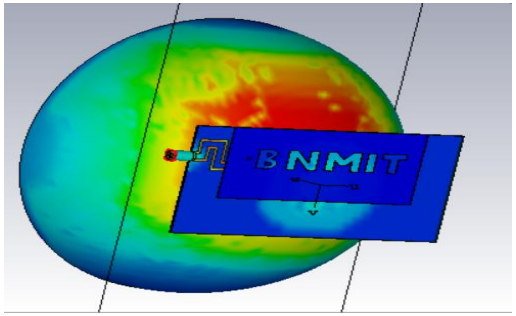
Side View

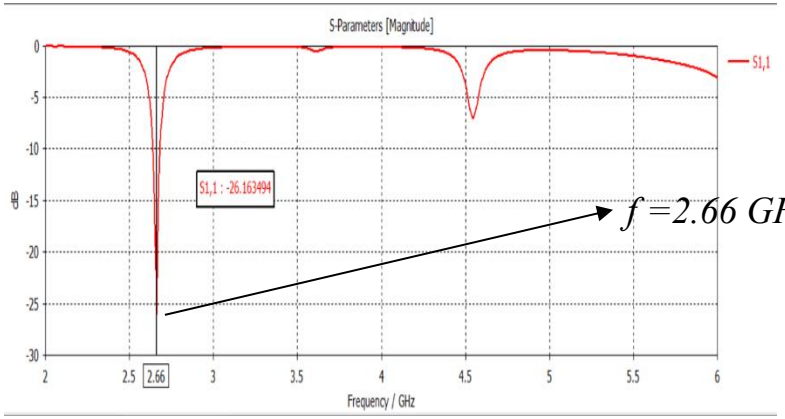


Back View

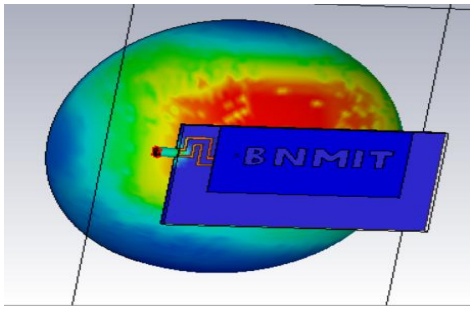


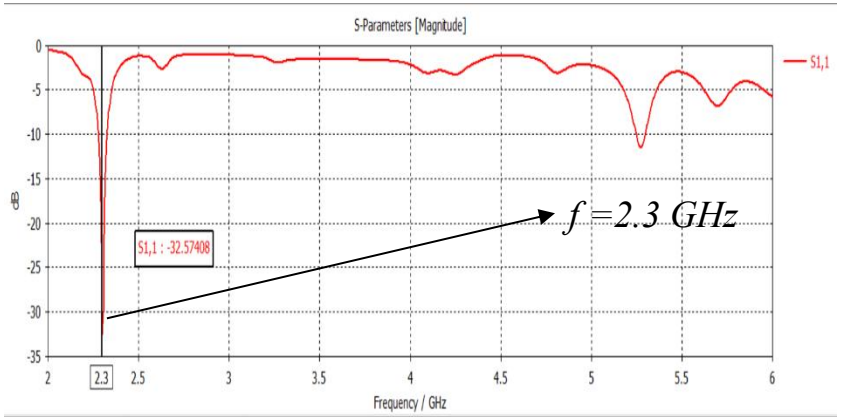
SAR Analysis Results {Denim & FR4}





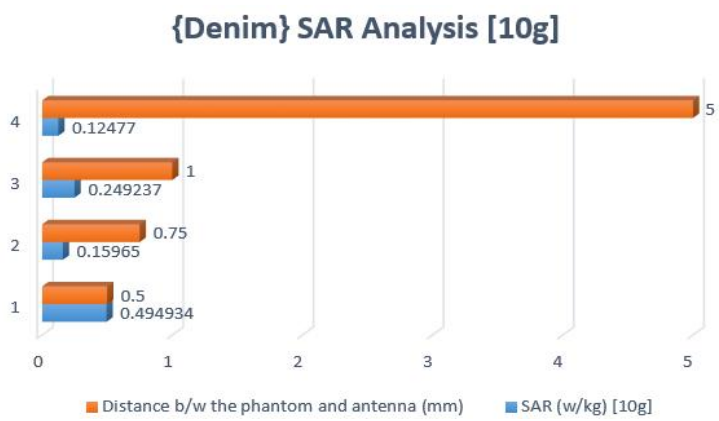
SAR distribution on human voxel model (10 g) in distance 0.75 mm from antenna at f =2.66 GHz.

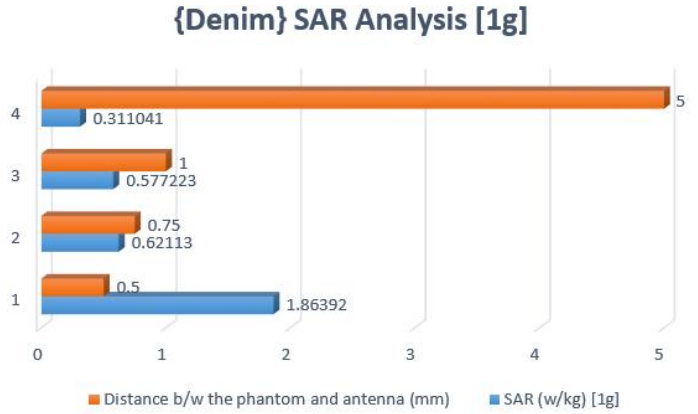


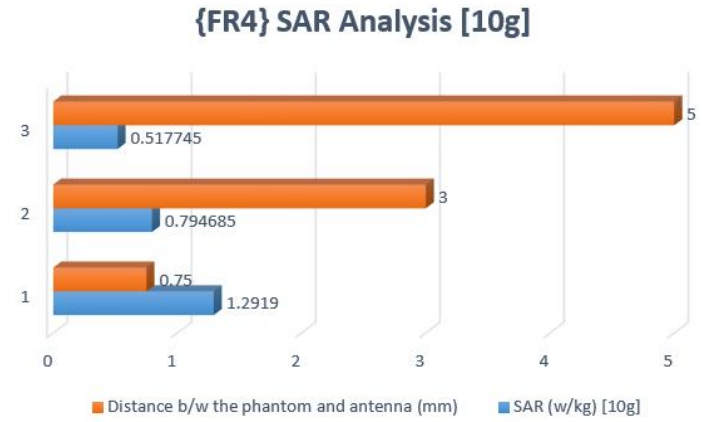


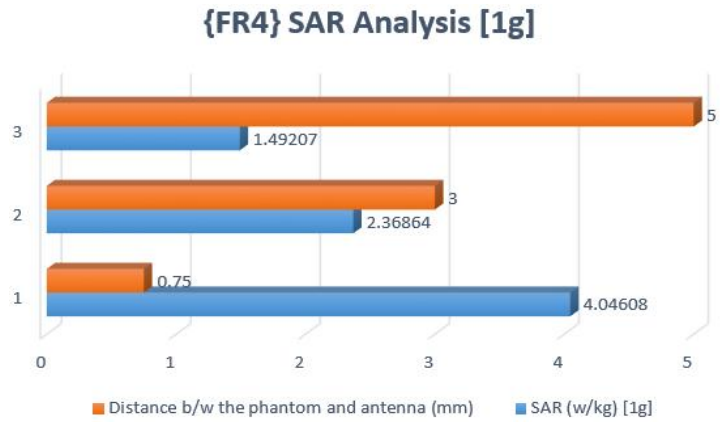
SAR distribution on human voxel model (10 g) in distance 3 mm from antenna at f= 2.3 GHz

Comparison results between SAR distribution and the separation distance from antenna on Phantom model









Conclusion

- Results demonstrated that the presented manufacturing methods are very flexible and can be effectively used to obtain a low-cost wearable antenna with performance tailored for the specific application at hand.

Antenna performance results

Parameters	Denim		FR4 (lossy)	
Operating Frequency (f_o) (GHz)	2.66		2.3	
Antenna Gain (dbi)	4.084		2.398	
Directivity (dbi)	7.062		4..098	
Return Loss (S11)(db)	-32.57		-26.16	
VSWR (Lp) (mm)	1.0415		1.084	
SAR (W/Kg)	0.75 mm		5 mm	
	0.62113 [1g]	0.1596 [10g]	0.1492 [1g]	0.511 [10g]
Impedance (Zo) (ohm)	30.18		18.21	

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Thank you

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