BOSTON UNIVERSITY

Wireless Power Transfer System

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Background

- Energy can be obtained directly without wires as a link

Methods

- HFSS for antenna simulation
- Inductive Coupling for Short range WPT
- Radiative Technology for Long range WPT

Result & Conclusion

- The range of Inductive coupling is still limited
- Antenna is good in simulation but has no real test data
- High frequency waves can cause health side-problems

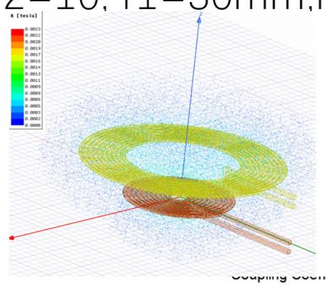
Acknowledgments

Thank Professor Osama for his encouragement and advice on doing a research.

Simulation & Models

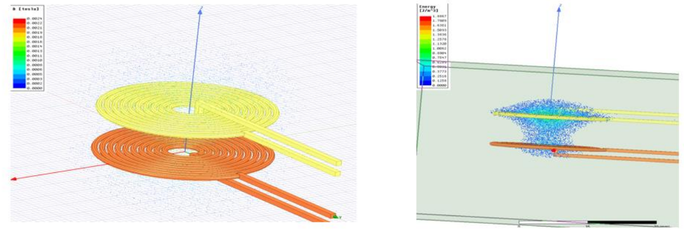
Coils

N1=10,N2=10, r1=30mm,r2=5mm



	distance1 [mm]	Matrix1.CplCoef(R1,R1) Setup1 : LastAdaptive	Matrix1.CplCoef(T1,R1) Setup1 : LastAdaptive	Matrix1.CplCoef(T1,T1) Setup1 : LastAdaptive	Matrix1.L(R1,R1) [uH] Setup1 : LastAdaptive	Matrix1.L(T1,R1) [uH] Setup1 : LastAdaptive	Matrix1.L(T1,T1) [uH] Setup1 : LastAdaptive
1	5.000000	1.000000	0.314615	1.000000	9.736289	1.646425	2.812760
2	10.000000	1.000000	0.268298	1.000000	9.679794	1.400264	2.813963
3	15.000000	1.000000	0.220705	1.000000	9.572954	1.145574	2.814333
4	20.000000	1.000000	0.177206	1.000000	9.390861	0.911164	2.815337
5	25.000000	1.000000	0.139418	1.000000	9.092036	0.705394	2.815549
6	30.000000	1.000000	0.107257	1.000000	8.609178	0.528044	2.815293

N1=10,N2=10,r1=5mm,r2=5mm



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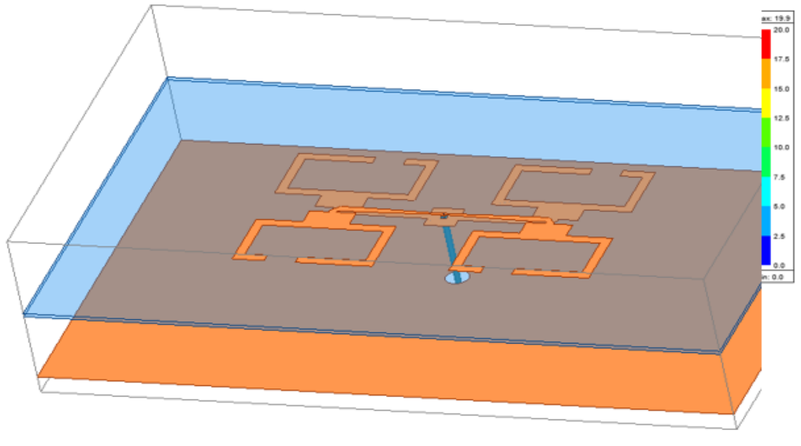
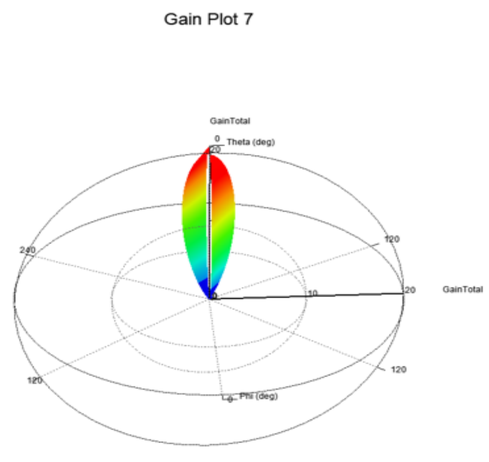
1	5.000000	1.000000	0.661923	1.000000	2.812068	1.862110	2.814297
2	10.000000	1.000000	0.440152	1.000000	2.806727	1.237144	2.814719
3	15.000000	1.000000	0.299211	1.000000	2.794792	0.839207	2.814704
4	20.000000	1.000000	0.206605	1.000000	2.773530	0.577220	2.814275
5	25.000000	1.000000	0.143846	1.000000	2.734927	0.399167	2.815570
6	30.000000	1.000000	0.100116	1.000000	2.661534	0.274066	2.815619

Antenna array





Power supply model