



**10<sup>th</sup> Academic Sessions**  
**University of Ruhuna, Matara, Sri Lanka**

**P22 Design of hybrid RF energy harvester with spiral antenna technology**

Pirapaharan K.,<sup>1</sup> Gunawickrama S.H.K.K.,<sup>2</sup> De Silva D.S.,<sup>2</sup> De Silva M.S.S.R.,<sup>3</sup>  
Dharmawardhana T.L.K.C.,<sup>3</sup> Indunil W.G.D.C.,<sup>3</sup> Wickramasinghe C.B.<sup>3</sup>

*<sup>1</sup>School of Engineering, Taylor's University, Malaysia, <sup>2</sup>Department of Electrical and Information Engineering, Faculty of Engineering, <sup>3</sup>Graduate, Faculty of Engineering*

There is an innumerable amount of energy all around us at all the time. We are being assaulted with energy waves every second of the day. Radio and television towers, satellites orbiting earth and even the cellular phone antennas are constantly transmitting energy while being absorbed by all the moving and fixed things and finally results the heat which has some role on global warming. What if there was a way we could harvest the energy that is being transmitted and use it as a source of power. If it could be possible to gather the energy and store it effectively, we could potentially use it to power other circuits. RF energy harvesting is a green technology which will reduce the increment of global warming by utilizing the RF energy in effective manner. This paper presents an implementation of a micro scale RF energy harvesting unit, based on the associated power of the frequency channels in the RF spectrum. This work includes antenna designing and measurement, implementing stage and testing procedures. The performance of the unit is studied with simulations. Mainly the work focused on designing of a suitable antenna which is capable of capturing the RF energy from different frequency bands of the spectrum. Antenna design was focused on to harvest energy from either GSM band or FM band due to power availability. The designed antenna was improved and testing was carried on. The captured RF energy from different bands was simultaneously used to convert in to electrical energy and an application is selected to be powered. Harvested energy can be used for applications as power source where the power requirement is W or mW level.

*Keywords:* RF energy harvesting, spectrum utilization, spiral antenna.