Cognitive Radio with Fast Sensing Technique Using Autocorrelation Approach

A.Lebda*, E. Gemeay*, S. Khamis*, and M. Khder**
**Faculty of Engineering -Tanta University, Tanta- Egypt*
*** Faculty of Engineering -Arab Academy of Science, Alexandria-Egypt*
hatlar_13@yahoo.com, entessar_gemeay@yahoo.com

Abstract **— the dynamic spectrum allocation is important to improve spectrum efficiency usage of available radio spectrum. Cognitive radio has emerged as a solution to dynamic spectrum access, due to its adaptability and re-configurability. The main problem of cognitive radio is how the secondary users can detect the holes in the frequency band of the primary users. Spectrum sensing is the main feature of cognitive radio technology. Finding a more accurate and efficient spectrum sensing technique is the core of cognitive radio technology to develop dynamic resource management in future wireless networks. A spectrum sensing based on the auto correlation technique provides performance improvement at very low SNR over the energy detection technique. In this paper, we show the autocorrelation spectrum sensing features over energy detection spectrum sensing technique. Analytical and Simulation results are performed in a non-fading and a fading environment as well. The results show that the autocorrelation technique has enormous superiority in performance over that of the energy technique.**

Keywords **— Cognitive radio, Spectrum sensing, Energy detection, Autocorrelation.**

A.Lebda, Damanhur, Al-Behera, Egypt. September 20th 1986. B.SC. in electronics and communication Engineering – Alexandria Higher Institute of Engineering & Technology. Alexandria, Egypt, (2008) with grade Very Good – GPA: 3. 07

He is Exempted from military and he is shift operator engineer at Damanhur combined cycle in west delta for electricity production company.

Mr. Lebda.

E. S. Gemeay Associate Professor, Department of Electronics & Communications Engineering, Tanta University, Obtained his Ph.D. degree from Tanta Univeresity 2010. Obtained his M.Sc. degree from Tanta Univeresity 2002. His area of interest is in wireless Communications.

Salah El Deen A. Khamis received his Ph.D. in Wireless Communications Engineering from Moscow Academy in 1992 and his M.Sc. in Communications Engineering from Menoufia University in 1985 and B.Sc. (honors) in Electrical Engineering from Cairo University in 1977. He is currently an associate professor of Wireless Communications department in Faculty of Engineering Tanta University.

M. E. Khedr Associate Professor, Department of Electronics and Communications Engineering Arab Academy for Science and Technology. Ph.D. degree from Ottawa University, Ottawa, Canada in 2004, in Electrical Engineering. Adjunct Professor in the ECE department at Virginia Tech. USA