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| **1.** | **Authors:** | **First Author Name, Second Author Name, Third Author Name** | |
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| **Abstract:** Nowadays, the usage of non-linear loads in power system is more sufficient. For example, UPS, inverters, converters, etc. These loads make the supply current as non-sinusoidal and distorted form, which is called harmonics. At this time Active power filters have been developed to improve power quality. In this Paper, a Shunt Active Power Filter (SAPF) control scheme has proposed to eliminate the current harmonics and improve the power quality. The shunt active power filter controlled by using the different controllers such as (PI, PID, Fuzzy logic, Pq Theory and hysteresis controller). In our proposed system, Hysteresis controller and Instantaneous power theory were used to reduce the harmonics current using the shunt active power filter. And both controllers’ results are compared, and then find which controller is most suitable to control the shunt active power filter in term of total harmonic reduction. MATLAB/SIMULINK power system toolbox is used to simulate the proposed system.  **Keywords:** Power Quality, Shunt Active Power Filter (SAPF), Hysteresis Current Controller, Harmonics, MATLAB/Simulink.  **References:**   1. Qian Liu, Li Peng, Yong Kang, Shiying Tang, Deliang Wu, and Yu Qi “A Novel Design and Optimization Method of anLCL Filter for a Shunt Active Power Filter” IEEE Transactions on industrial electronics, vol. 61, No. 8, pp:4000-4010,august 2014. 2. Anand Singh, Dr. Prashant Baredar,“Power Quality Analysis of Shunt Active Power Filter Based On Renewable Energy Source” IEEE International Conference on Advances in Engineering & Technology Research (ICAETR - 2014). 3. Jeevananthan.K.S, “Designing of Single Phase Shunt Active Filter Using Instantaneous Power Theory” International journel on Electric Engineering & Research ,Vol. 2, Issue 2, pp: (1-10), Month: April - June 2014. 4. Quoc-Nam Trinh and Hong-Hee Lee, Senior Member, IEEE “An Advanced Current Control Strategy for Three-Phase Shunt Active Power Filters” IEEE Transactions on industrial electronics, vol. 60, no. 12,pp:5400-5411 December 2013. 5. H. Sasaki and T. Machida, "A New Method to Eliminate AC Harmonic by Magnetic Compensation Consideration on Basic Design," IEEE Trans. on Power Apparatus and Syst., vol. 90, no. 5, pp. 2009-2019. 6. H. Akagi, Y. Kanazawa, K. Fujita And A. Nabae “Generalized Theory of Instantaneous Reactive Power and Its Application” Electrical Engineering in Japan, Vol. 103, No. 4 *,* 1983 7. H. Akagi “Control Strategy and Site Selection of a Shunt Active Filter for Damping of Harmonic propagation in Power Distribution Systems” IEEE Transactions on Power Delivery, Vol. 12, No 1, 1997 8. T. Narongrit, K-L. Areerak and K-N. Areerak “The Comparison Study of Current Control Techniques for Active Power Filters” 2011 9. H. Akagi “New Trends in Active Filter for Power Conditioing” IEEE Transactions On Industry Applications, Vol 32, No 6, 1996 10. H. Akagi, E. H. Watanabe, M. Aredes “Instantaneous Power Theory and Application to Power Conditioning” IEEE Press, 2007. | | **1-3** |