

In this paper, an adaptive monitoring scheme with Fuzzy Logic Filter (FLF) is developed and applied to monitor a Grid-Connected Photovoltaic System (GCPVS). This method is based on Principal Component Analysis (PCA) and Moving Window Principal Component Analysis (MWPCA). It is designed to generate adaptive thresholds for its monitoring indices. The FLF filters the monitoring indices to reduce the number of False Alarms (FA) and increase the Fault Detection Rate (FDR). The application is carried out on the GCPVS of the [Power Electronics](#) and Renewable Energy Research Laboratory (PEARL) of Malaya University. The proposed technique is compared against PCA method in terms of FAR reduction. The detection ability of the adaptive thresholding with FLF monitoring scheme is tested first on simulated faults then it is applied to detect a real abnormal behaviour. The results show that the proposed method is effective in reducing the number of false alarms and in detecting different types of faults with high accuracy