

# Comparative Analysis of Various Methodologies for Voltage Swell and Sag Detection in Online and Offline Conditions

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**Abstract:** *The fundamental voltage, current, and phase angle are required for a wide variety of power system applications. While detecting the sag and swell the important parameters required to be considered are their Magnitude, Duration and Phase Angle Jump. Various techniques use to detect voltage sag include: Root Mean Square (RMS), Fourier transform, Peak voltage detection and Missing voltage method. The problem with these methods is that they use a windowing technique and can therefore be too slow when applied to detect and mitigate voltage sags and swells since they use historical data. In this paper, the voltage sag and swell is detected using wavelet transform method, Root Mean Square (RMS), Fourier transform, Peak voltage detection and Missing voltage method. All these methods are compared on the basis of their, detection time, depth of the sag and sampling frequency. It is found that the wavelet transform is very powerful tool to detect voltage sag and swell. It gives accurate start and end detection time and duration of sag. All these methods are tested under offline and online conditions..*

**Keywords:** Power Quality (PQ), Fourier Transform (FT), Wavelet Transform.

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