Denoising solar radiation data using meyer wavelets

Abstract

Signal processing is important in solar energy data analysis since the received solar radiation data fluctuates continuously. Some of the fluctuations can be considered as noise, and need to be filtered out before the signal will be used for other analysis. There exist various methods in order to filter the noise and one of the promising methods iswavelets transform. This paper utilized the use of wavelet transformmethod for solar radiation denoising. The Meyer wavelets have been utilized, instead of the usual sinusoidal or Gaussian type functions. Since Meyer wavelets are obtained directly from its Fourier transform which is in terms of sinusoidal functions, optimized Meyer wavelets may give a good indication of the solar radiation data. Results showed Heuristic Stein Unbiased Estimate of Risk (SURE) and SURE gave better denoised results as compared to Minimax and Fixed Form methods.