On the different derivatives of the half spectral density

The half spectral density is normally used as primary data by frequency-domain output-only identification techniques. It is defined as the Fourier transform of the half (positive part) of the correlation function. The classical way of computing the half spectral density consists of disregarding the negative part of the correlation function. It turns out, however, that when the negative part is neglected, a discontinuity is created around zero. It is well known that this discontinuity introduces increasing constant noise levels in the frequency domain, which is normally reduced by dividing the initial value of the correlation function by a factor of two. In this paper, different ways of reducing the discontinuity are considered, and the effect of these modifications on the increased noise in the frequency domain is studied.

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