
Subject: Re: bug in IDL's hanning() window-generating function

Posted by [bennetsc](#) on Tue, 07 Aug 2001 06:33:57 GMT

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In article <9kg7jb\$bbt\$1@news.orst.edu>, I, <bennetsc@NOSPAMucs.orst.edu>, wrote:

> I have not filtered the data before applying the window and
> taking the transform because I want to see all of the resolvable
> spectrum. A data window is still necessary to prevent generation
> of spurious spectral power that would result from the break in
> "continuity" at the data segment boundaries.

I see I forgot to mention the other big reason for using a data window, which is to reduce leakage. Not using a data window is the same thing as using a rectangle (i.e. boxcar) window, which results in no leakage at all *iff* the only signals in the data are exactly at one or more of the Fourier frequencies for the time period being transformed and there is no noise in the data. In the real world, however, that is virtually never the case. Energy in any frequency band in a spectrum may lose and/or gain energy to/from any other band in that spectrum by leakage, which kind of runs counter to the whole point of analyzing a spectrum. The amplitude of leakage is worst for the rectangle window (i.e. no window) and is typically very much reduced for other windows.

Scott Bennett, Comm. ASME LG, CFIAG
College of Oceanic and Atmospheric

Sciences

Oregon State University
Corvallis, Oregon 97331

* Internet: sbennett at oce.orst.edu *

* "Lay then the axe to the root, and teach governments humanity. *

* It is their sanguinary punishments which corrupt mankind." *

* -- _The_Rights_of_Man_ by Tom Paine (1791.) *
