

Re: Fourier analysis Q

Source: <http://sci.tech-archive.net/Archive/sci.physics/2005-11/msg00245.html>

- *From:* "Randy Poe" <poespam-trap@xxxxxxxxxx>
 - *Date:* 4 Nov 2005 11:10:04 -0800
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bill wrote:

> I have some data that, when I histogram it, shows some degree of
> quantization (i.e. the histogram has definite spikes at regular
> intervals, and this is not an artifact of the histogramming
> procedure). The spikes decay in magnitude roughly exponentially.
> (In between the spikes the hits are few but not zero.)

As I read this, what you are really asking is whether there's a good statistical test for the question "is my data from a quantized source?" and wondering whether the tools of Fourier analysis or time-series analysis could be brought to bear to answer that question.

Also I gather these are to be regarded as random samples from some unknown distribution rather than having any particular order.

I'd be inclined to do a (nonlinear) least squares fit to the histogram itself, of a model that included evenly spaced discrete values, plus gaussian noise (I suspect that's what your "exponential" decay between the spikes is).

Free parameters: spacing (approximately 42)
probability data value = $k \cdot \text{spacing}$, $k=1, \dots, \text{maxspike}$
sigma of additive gaussian noise

– Randy

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• *References:*

◆ *Fourier analysis Q*

◇ *From:* bill

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Re: Fourier analysis Q

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