
Subject: Different FFT-results on vector and array?!

Posted by [jan](#) on Tue, 30 May 1995 07:00:00 GMT

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When checking out amplitude and phase of a given frequency in several subwindows of a given timewindow I ran into the following problem:

I have to FFT the array "data(dim,3)" where dim is a given long integer. In the first step I perform the FFT on the whole array at once and in the second try I perform the FFTs on data(*,0), data(*,1) and data(*,2).

The results are stored in both cases in temp(*,*).

My problem is: these two strategies yield different results...

Following I attached the relevant code of both cases...

(variables n1, n2, k, freq and delta are predefined in the code before)

---FFT on the array at once:

REPEAT BEGIN

dim = LONG(N_ELEMENTS(data(n1:n2,0)))

ff = FLTARR(dim/2+1,3)

pp = FLTARR(dim/2+1,3)

temp = COMPLEXARR(n2-n1+1,3)

temp2 = 1000.*data(n1:n2,*)

temp = FFT(temp2,-1)

ff = FLOAT(temp(0:dim/2,*))

pp = IMAGINARY(temp(0:dim/2,*))

k = k + 1

a(k,freq,*) = ff(freq,*) ;a is FLTARR(k_max,freq_max,3)

p(k,freq,*) = pp(freq,*) ;p is FLTARR(k_max,freq_max,3)

n1 = n1 + delta

n2 = n2 + delta

ENDREP UNTIL (<certain condition is true>)

---FFT on vectors containing the array-columns:

REPEAT BEGIN

dim = LONG(N_ELEMENTS(data(n1:n2,0)))

ff = FLTARR(dim/2+1,3)

pp = FLTARR(dim/2+1,3)

temp = COMPLEXARR(n2-n1+1,3)

temp2 = 1000.*data(n1:n2,0)

temp(*,0) = FFT(temp2,-1)

temp2 = 1000.*data(n1:n2,1)

temp(*,1) = FFT(temp2,-1)

temp2 = 1000.*data(n1:n2,2)

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temp(*,2) = FFT(temp2,-1)
ff = FLOAT(temp(0:dim/2,*))
pp = IMAGINARY(temp(0:dim/2,*))
k = k + 1
a(k,freq,*) = ff(freq,*) ;a is FLTARR(k_max,freq_max,3)
p(k,freq,*) = pp(freq,*) ;p is FLTARR(k_max,freq_max,3)
n1 = n1 + delta
n2 = n2 + delta
ENDREP UNTIL (<certain condition is true>)
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When plotting a(i,freq,[0,1,2]) over i I get different results for the above two cases. All surrounding code, including the stop-repeat-condition is exactly the same for both routines. I'm sure there must be a pretty silly mistake - however, I can't figure out where it is ...

Any hints?

Thanks in advance,

Jan

(e-mail is welcome, too)

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