Subject: Re: Coadd images that contain no stars
Posted by Helder Marchetto on Wed, 30 May 2012 08:58:53 GMT
View Forum Message <> Reply to Message

> http://en.wikipedia.org/wiki/Phase_correlation

Hi Russel and IDLers,
the phase correlation method basically calculates the correlation by using FFT() operations:
FFT_ImgA = FFT(ImgA,-1)
FFT_ImgB = FFT(ImgB,-1)
FFT_ImgA*CONJ(FFT_ImgB) / ABS(FFT_ImgA*CONJ(FFT_ImgB))
and then locating the maximum (with an appropriate function for higher accuracy).

On the other hand the Astro-Library Correl_Images function "computes the 2-D cross-correlation function of two images for a range of (x,y) shifting by pixels of one image relative to the other".
This is done using FOR loops for the pixel shifting.
This is generally speaking not the "IDL-way", but I guess there is no direct way around this. As far as I could see, the Astro I've looked a bit into this and found that the IDL CORREL() function is quite similar but not identical (but maybe I used the wrong keywords...).

Now the question: how do these two methods compare? FFT procedures will perform well for images with sizes of 2^n, whereas the Astro-Library uses a recursive method to "zoom" in and this might give better accuracy.

Does anybody have a better idea about how these two methods? When should they be used and when should they not be used?

To make things more complicated I actually have to calculate the rotation and scaling for a given pivot point. If I can get the rotation and scaling, then I find the pivot point by testing the image drift/shift on a grid of pivot points and the one with the lowest drift/shift I then consider to be the pivot point.
This method is not very efficient when the drift/shift evaluation is unstable...

Cheers,
Helder

PS: Sorry for the bunch of questions, but I couldn't find any relevant literature that does not involve going through a full book and making use of half a paragraph to solve the problem.