
Subject: Re: Image analysis and ring identification
Posted by [Paul Van Delst\[1\]](#) on Thu, 18 Apr 2002 13:44:37 GMT
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David Fanning wrote:

>
> Rachel Pepper (Rachel_Pepper@brown.edu) writes:
>
>> Actually, the rings often have a bright spot that is not in the center of
>> the ring, so I don't think the centroiding technique will work. Do you have
>> any other suggestions?
>
> I think Paul's suggestions are right on the money,
> but I wouldn't give up on the centroid theory too
> quickly. The wonderful thing about centroids is that
> they are really center of mass calculations. So if
> the values you total are actual image values,
> then the centroid will naturally zero in on
> bright spots, since they are "heavier" in the
> calculations.

Personally I prefer the centroid method. I think its more accurate than simple peak-finding. If the bright spot is a nice gaussian shape, then determining the maximum will probably do the job. In the real world nice smooth shapes are rare, so the centroid method is the way to go.

My experience in this area is with finding the centroid of a satellite instrument channel spectral response function (SRF). An SRF is determined by the detector response, properties of optical components directing the radiation onto the detector, the instrument field of view etc. etc. The resultant SRF is replete with bumps, wiggles, and shimmies. Calculating the first moment of the SRF (the frequency centroid) is really the only way to do it accurately. If it's not done accurately, then any calculated Planck function radiances will be slightly incorrect and this will introduce a frequency dependent bias in any comparison of satellite observations with calculations. That is not a Good Thing (tm).

If the OP's particles are "macroscopic" (i.e. she's not searching for Higg's bosons amidst a slurry of those pesky W and Z particles :o) and have a shape to them, then the centroid method is recommended.

paulv

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