
Subject: Re: phase unwrapping
Posted by [Clay Kirkendall](#) on Tue, 18 Sep 2001 18:36:35 GMT
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Alexander Rauscher wrote:

> hi everybody
>
> i need a phase unwrapping algorithm (MRI, buti think it doenst really
> matter what type of data it is. does anyone have experience with
> this? it turnded out to be quite a tough problem...
> alex

Alex,

Here is a routine that I have been using for several years without problems.

It defaults to 2pi phase resets but by using thresh and step it will correct

for any step size. Depending on your data you may need to manually set thresh and step.

Good luck,
Clay

Function unwrap, x, thresh, step

```
;  
;  
; This routine removes resets from data vectors that have a  
; modulus reset of size step. The data record is scanned for  
; |resets| > |thresh| and adjusts the x by multiples of step  
;  
;  
;  
;  
; MODIFICATIONS: 2/99 - added defaults for thresh and step  
; 000831 - let x be an array  
;  
;
```

```
if n_params() eq 1 then $  
  Begin  
    thresh = !pi * 1.5  
    step = 2 * !pi  
  EndIf
```

```
  sx=size(x)  
  if sx(0) EQ 0 then $  
    BEGIN  
      print, 'X must be a vector for this routine'
```

```

        return, NaN
    ENDIF

if sx[0] EQ 2 then $ ;Input is a two dimensional array
    Begin
        lx = length(x)

        ;get the derivative
        dt=x(*, 0:lx-2) - x(*, 1:lx-1)

        ;search for steps greater then thresh
        ddt=float(dt ge thresh) - (dt le (-thresh))

        iddt=[ [replicate(0.0, sx[1])], [total(ddt, 2,
/CUMULATIVE))] * step

        return, x + iddt

    EndIf Else $
    Begin
        lx = max(sx(1:sx(0)), dim)

        ;get the derivative
        dt=x(0:lx-2) - x(1:lx-1)

        ;search for steps greater then thresh
        ddt=(dt ge thresh)*1. - (dt le (-thresh))

        iddt=[0, total(ddt, /CUMULATIVE)] * step

        return, x + iddt

    EndElse

END

```
