
Subject: Re: Voigt function in mpfit

Posted by [Markus Schmassmann](#) on Wed, 25 Oct 2017 13:37:18 GMT

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On 10/25/2017 01:15 PM, abc wrote:

> HI, I have set of data of an absorption spectra and I want to fit the voigt profile using mpfit. The function I am using is [http://www.heliodocs.com/php/xdoc_print.php?file=\\$SSW/yohkoh/lucon/idl/metcal/vsvoigt.pro](http://www.heliodocs.com/php/xdoc_print.php?file=$SSW/yohkoh/lucon/idl/metcal/vsvoigt.pro)

> But I am getting error as

> GDL> res=mpfit('voigt',p0,functargs=fa)

> % VOIGT: function VOIGT takes 2 params: 'Result = VOIGT(A,U)'

> % Execution halted at: MPFIT_CALL_FUNC_EXTRA 1396

/home/abc/Documents/gdl/pro/pro/mpfit.pro

> % MPFIT_CALL 1439 /home/abc/Documents/gdl/pro/pro/mpfit.pro

> % MPFIT 3185 /home/abc/Documents/gdl/pro/pro/mpfit.pro

> % \$MAIN\$

> Kindly help

>

I recommend looking at the documentation in MPFITFUN.pro & VOIGT.pro &

https://en.wikipedia.org/wiki/Voigt_profile#Relation_to_Voigt_profile

I'll probably end up with something like this, but check the derivatives

before using AUTODERIVATIVE=0 or PARINFO[i].MPSIDE = 3.

You can do this manually or using

```
; PARINFO[i].MPSIDE = 3 ; Enable explicit derivatives
; PARINFO[i].MPDERIV_DEBUG = 1 ; Enable derivative debugging mode
; PARINFO[i].MPDERIV_RELTOL = ?? ; Relative tolerance for comparison
; PARINFO[i].MPDERIV_ABSTOL = ?? ; Absolute tolerance for comparison
for more details see the documentation in MPFIT.pro
```

I hope this works, beyond compiling I have not debuged it.

Good luck, Markus

```
function voigt_wrapper, x, p, dp
  voigt, p[1]/(sqrt(2)*p[0]),x/(sqrt(2)*p[0]),h,f
  if n_params() gt 2 then begin
    requested=dp
    dp = make_array(n_elements(x), n_elements(p), value=x[0]*0)
    if requested[0] ne 0 then $
      dp[*,0]=-p[2]*(p[1]*f-x*h)/(sqrt(2!*dpi)*p[0]^3)
    if requested[1] ne 0 then $
      dp[*,1]=-p[2]*( (2*p[1]-h)/(sqrt(2!*dpi)*p[0]^2) $
        -(p[1]^2*h+2*x*f*p[0]-x^2*h)/p[0]^3 )
    if requested[2] then ne 0 dp[*,2]=-1/(sqrt(2!*dpi)*p[0])*h
    if requested[3] then ne 0 dp[*,3]=1d
  endif
```

```
    return, p[3] - p[2]/(sqrt(2*!dpi)*p[0])*h  
end
```

```
p0=[sigma0,gamma0,norm,cont]  
p_out = MPFITFUN('voigt_wraper', x, y, err, p0)
```
