Subject: Re: bessel
Posted by meron on Fri, 05 Nov 1999 08:00:00 GMT
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In article <3822F3E4.F6A4A8D3@phim.unibe.ch>, Michael Kueppers
<michael.kueppers@phim.unibe.ch> writes:
> enea wrote:
>
>> I have to calculate the modified Besell functions K(y).
>> I 'm not able to do it in idl.
>> Someone can help me?
>>
>> Excuse me for my bad english
>>
>> Claudia
>
> The IDL-functions below are the Bessel-functions
> K_0(y) and K_1(y) taken from "Numerical Recipes in C"
> (Press et al. 1992, Cambridge Univ. Press) and
> translated to the
> Interactive Data Language. Should your question refer
> to the other idl (I am sufficiently ignorant not to know if this
> is a possibility), please apologize for bothering.
> You can construct higher order bessel functions by
>
> -2n / x * K_n(x) = K_(n-1) (x) - K_(n+1) (x)
>
There is also my BESELK function, which'll calculate Bessel K
functions of any order (including fractional) as well as their
integrals (x to infinity)

Mati Meron | "When you argue with a fool,
meron@cars.uchicago.edu | chances are he is doing just the same"

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Best wishes,
Michael

```
FUNCTION beselk0,X,z
; Compute the modified Bessel-function of second kind and zeroth order
;                                       M.K., 1.5.97
; Completely changed: now taken from "Numerical recipes in C", Press et al.,
; 1992, and translated from C to IDL.
;                               M.K., 2.5.97
; Corection in case that X is a vector. Also, dummy variable z added to allow
function for INT_2d
;                               M.K., 14.7.99


ans = X
FOR I =0,(N_ELEMENTS(X)-1) DO BEGIN
If X(I) LE 2. THEN BEGIN
    Y = X(I)*X(I)/4.
    ans(I) = (-alog(X(I)/2.)*BESELI(X(I),0)) + (-0.57721566 + Y*(0.42278420 +$
         Y*(0.23069756 + Y*(0.03488590 + Y*(0.262698e-2 +$
        Y*(0.10750e-3 + Y*0.74e-5))))))
ENDIF ELSE BEGIN
    Y = 2.0/X(I)
    ans(I) = (EXP(-X(I))/SQRT(X(I)))*(1.25331414 + Y*(-0.07832358 +$
         Y*(0.02189568 + Y*(-0.01062446 + Y*(0.587872e-2 +$
         Y*(-0.251540e-2 + Y*0.53208E-3))))))
ENDELSE
ENDFOR

RETURN, ans

END
```

```
 FUNCTION beselk1,X
; Compute the modified Bessel-function of second kind and first order
; Taken from "Numerical recipes in C", Press et al.,
; 1992, and translated from C to IDL.
;                              M.K., 14.7.99

ans = X
FOR I =0,(N_ELEMENTS(X)-1) DO BEGIN
If X(I) LE 2. THEN BEGIN
    Y = X(I)*X(I)/4.
    ans(I) = (alog(X(I)/2.)*BESELI(X(I),1))  + $
 (1./X(I))*(1.+Y*(0.15443144+Y*(-0.67278579+Y*(-0.18156897+Y* (-0.01919402+Y*$
       (-0.00110404+Y*(4.686e-5)))))))
ENDIF ELSE BEGIN
    Y = 2.0/X(I)
    ans(I) = (EXP(-X(I))/SQRT(X(I)))*(1.25331414 +
 Y*(0.23498619+Y*(-0.03655620+Y*(0.01504268+Y*(-0.00780353+y* (0.00325614+Y*$
       (-0.00068245)))))))
ENDELSE
ENDFOR

RETURN, ans

END
```

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