Subject: Quaternion spherical interpolation in PV-Wave
Posted by ez569x on Tue, 11 Nov 2008 22:18:00 GMT
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I have been been a user of PV-Wave for the last seven years. Let me say here that without this newsgroup's help, I probably wouldn't have lasted seven months. I've learned a great deal from all the valuable posts and been inspired to implement many routines. It's time to donate back.
PV-Wave doesn't have any quaternion routines. Craig Markwardt does. I've implemented his routines, but the only one that needed some tweaking was QTERP. Thanks to Craig for validating my results.

```
function qterp, t0,q0,t1,qdiff=qdiff,reset=reset,slerp=slerp
; This function has been modified for implementation
; in PV-Wave from the original written by Craig Markwardt.
; Many thanks to him for his help verifying this implementation.
; All other quaternion routines are as originally written.
nq=n_elements(q0)/4
if nq eq 0 then begin
  print,'no q input, stopping...'
  return, -1
endif
if nq eq 1 then return,rebin(reform(q0,4,1),4,n_elements(t1))
if keyword_set(slerp) then begin
  if n_elements(qdiff)/4 ne nq-1 or keyword_set(reset) then begin
    qdiff=qtmult(q0(*,0:nq-2),/inv,q0(*,1:*))
    wh=where(qdiff(3,*) lt 0,ct)
    if ct gt 0 then qdiff(*,wh)=qdiff(*,wh)
  endif
  ii=floor(mgh_locate(t0,xout=t1)) < (nq-2) > 0 ; mark hadfield
  hh=(t1-t0(ii)/(t0(ii+1)-t0(ii))
  return,qtmult(q0(*,ii),qtpow(qdiff(*,ii),hh))
endif
q1=(q0(*,0)#t1)*0
for i=0,3 do q1(i,*)=spline(t0,q0(i,*),t1)
tot=sqrt(total(q1^2,d=0))
for i=0,3 do q1(i,*)=q1(i,*)/tot
return,q1
end
```

Regards,
SpinMan