Subject: Ternary diagrams
Posted by hunter on Thu, 17 Jun 2004 14:43:04 GMT
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Hi there,

Hope you're all having a good day. I'm trying to generate a ternary diagram (Triangular coordinates) in IDL and can't seem to find much on the subject in the IDL help. I assume its something I'll have to built from scratch. However, I'd rather not reinvent the wheel. Has anybody had some experince in this area? or can someone please provide me with a good reference on the subject?

Any help would be appreciated.

Thanks,
Eli

Subject: Re: Ternary diagram
Posted by Wox on Mon, 03 Sep 2007 13:13:54 GMT
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On Sat, 01 Sep 2007 18:23:07 -0000, robinson.inj@gmail.com wrote:

> Dear all,
> Does someone can show me (or point me out a link) how to generate
> ternary diagrams/plots in IDL?
> I will really appreciate your assistance.
> Robinson

There is nothing out there that I know of that generates ternary diagrams. I tried to make something myself ones. Maybe it'll get you started:

```
function NormToTriangle,Anorm,Bnorm,Cnorm,AP,BP,CP

; equation line : y=(x-x1).(y2-y1)/(x2-x1)+y1 (2 points)
;      y=(x-x1).r+y1 (rico+point)

sqrt3=sqrt(3)
n=n_elements(Anorm)

PAx=CP[0]-0.5*Anorm
```

```
PAy=CP[1]+(sqrt3*0.5)*Anorm
;rC = 0

PBx=AP[0]-0.5*Bnorm
PBy=AP[1]-(sqrt3*0.5)*Bnorm
;rA = -sqrt3

PCx=BP[0]+Cnorm
PCy=BP[1]*replicate(1,n)
;rB = sqrt3

; find point where these three lines cross
; (bad code, just checked two lines)
Px=(-PAy+sqrt3*PBx+PBy)/sqrt3
Py=(PBx-Px)*sqrt3+PBy

return,{x:Px,y:Py}
end;function NormToTriangle

;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%

pro  TriangleConstr,AP,BP,CP,pfree,R=R,GAP=GAP,ArrowCoord=ArrowCo ord

; AP,BP,CP: corner coordinates
; pfree: procent of window size to leave free on one side of the
triangle
; R: vertex length
; GAP: scale the trangle and leave gaps
; ArrowCoord: ArrowCoord


;     A
;        / \
;       /   \
;      /     \
;     /       \
;    /         \
;   B___________C

XS=!d.x_size
YS=!d.y_size

X0=XS/2.
Y0=YS/2.
XY0=X0<Y0
R0=(1-pfree)*XY0
R=R0*sqrt(3)
```

```
Y0=Y0-0.25*R0

dX=R*0.5
dY=R0*0.5
AP=[X0,Y0+R0]
BP=[X0-dX,Y0-dY]
CP=[X0+dX,Y0-dY]

if keyword_set(GAP) then begin
 ct=sqrt(3)*0.5

 DR=(1-GAP)*XY0-R0
 dX=dR*ct
 dY=dR*0.5
 dZ=dY*[ct,0.5]
 dU=dY*[-ct,0.5]
 dV=[0,-dY]

 ArrowCoord=[[BP+dV],[CP+dV],[CP+dZ],$
 [AP+dZ],[AP+dU],[BP+dU]]
endif

end;pro TriangleConstr

;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%%

pro
 TernaryDiagram,Ain,Bin,Cin,ATitle=ATitle,BTitle=BTitle,CTitl e=CTitle

; ----Check primary parameters----
if not keyword_set(ATitle) then ATitle='A'
if not keyword_set(BTitle) then BTitle='B'
if not keyword_set(CTitle) then CTitle='C'

nA=n_elements(Ain)
nB=n_elements(Bin)
nC=n_elements(Cin)

if (nA eq 0) or (nB eq 0) or (nC eq 0) or (nA ne nB) or (nA ne nC)
then $
 message,'A,B,C dimensions are wrong.'

; ----Construct diagram----
pfree=0.02
gap=-0.1
gap2=-0.2
TriangleConstr,AP,BP,CP,pfree,R=R,GAP=gap,ArrowCoord=AC
```

```
TriangleConstr,APl,BPl,CPl,gap,GAP=gap2,ArrowCoord=AC2

plots,[BP[0],CP[0]],[BP[1],CP[1]],/device,thick=2
plots,[CP[0],AP[0]],[CP[1],AP[1]],/device,thick=2
plots,[AP[0],BP[0]],[AP[1],BP[1]],/device,thick=2
xyouts,BPl[0],BPl[1],BTitle,/device
xyouts,CPl[0],CPl[1],CTitle,/device
xyouts,APl[0],APl[1],ATitle,/device
arrow,AC[0,0],AC[1,0],AC[0,1],AC[1,1]
arrow,AC[0,2],AC[1,2],AC[0,3],AC[1,3]
arrow,AC[0,4],AC[1,4],AC[0,5],AC[1,5]

xyouts,(AC2[0,4]+AC2[0,5])/2,(AC2[1,4]+AC2[1,5])/2,BTitle+'
%',/device,ORIENTATION=60
xyouts,(AC2[0,0]+AC2[0,1])/2,(AC2[1,0]+AC2[1,1])/2,CTitle+'
%',/device,ORIENTATION=0
xyouts,(AC2[0,2]+AC2[0,3])/2,(AC2[1,2]+AC2[1,3])/2,ATitle+'
%',/device,ORIENTATION=-60

; ----Derive coordinates----

; sum must be 1, then scale between 0-R
sum=float(Ain+Bin+Cin)
Anorm=Ain/sum*R
Bnorm=Bin/sum*R
Cnorm=Cin/sum*R

data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
plots,data.x,data.y,psym=2,/device

; ----Grid----
n=10
m=n-1
ind=(indgen(1,m)+1.)/n
rind=reverse(ind,2)
zero=replicate(0.,1,m)

;CA
Anorm=[zero,ind]*R
Bnorm=[ind,zero]*R
Cnorm=[rind,rind]*R
data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
for i=0,m-1 do $
 plots,data.x[*,i],data.y[*,i],linestyle=1,/device

;AB
Anorm=[ind,ind]*R
Bnorm=[zero,rind]*R
```

```
Cnorm=[rind,zero]*R
data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
for i=0,m-1 do $
 plots,data.x[*,i],data.y[*,i],linestyle=1,/device

;BC
Anorm=[rind,zero]*R
Bnorm=[ind,ind]*R
Cnorm=[zero,rind]*R
data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
for i=0,m-1 do $
 plots,data.x[*,i],data.y[*,i],linestyle=1,/device


end;pro TernaryDiagram

;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%

pro example

window
A=[20,50,25,20]
B=[30,0,25,70]
C=[50,50,50,10]

TernaryDiagram,A,B,C

end;pro example
```

Subject: Re: Ternary diagram
Posted by robinson.inj on Mon, 03 Sep 2007 15:51:19 GMT
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On Sep 3, 6:13 am, Wox <nom...@hotmail.com> wrote:
> On Sat, 01 Sep 2007 18:23:07 -0000, robinson....@gmail.com wrote:
>> Dear all,
>> Does someone can show me (or point me out a link) how to generate
>> ternary diagrams/plots in IDL?
>> I will really appreciate your assistance.
>> Robinson
>
> There is nothing out there that I know of that generates ternary
> diagrams. I tried to make something myself ones. Maybe it'll get you
> started:
>
> function NormToTriangle,Anorm,Bnorm,Cnorm,AP,BP,CP

```
>
> ; equation line : y=(x-x1).(y2-y1)/(x2-x1)+y1 (2 points)
> ;                           y=(x-x1).r+y1 (rico+point)
>
> sqrt3=sqrt(3)
> n=n_elements(Anorm)
>
> PAx=CP[0]-0.5*Anorm
> PAy=CP[1]+(sqrt3*0.5)*Anorm
> ;rC = 0
>
> PBx=AP[0]-0.5*Bnorm
> PBy=AP[1]-(sqrt3*0.5)*Bnorm
> ;rA = -sqrt3
>
> PCx=BP[0]+Cnorm
> PCy=BP[1]*replicate(1,n)
> ;rB = sqrt3
>
> ; find point where these three lines cross
> ; (bad code, just checked two lines)
> Px=(-PAy+sqrt3*PBx+PBy)/sqrt3
> Py=(PBx-Px)*sqrt3+PBy
>
> return,{x:Px,y:Py}
> end;function NormToTriangle
>
;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%
>
> pro  TriangleConstr,AP,BP,CP,pfree,R=R,GAP=GAP,ArrowCoord=ArrowCo ord
>
> ; AP,BP,CP: corner coordinates
> ; pfree: procent of window size to leave free on one side of the
> triangle
> ; R: vertex length
> ; GAP: scale the trangle and leave gaps
> ; ArrowCoord: ArrowCoord
>
> ;                A
> ;        / \
> ;       /   \
> ;      /     \
> ;     /       \
> ;    /         \
> ;    B___________C
>
> XS=!d.x_size
```

```
> YS=!d.y_size
>
> X0=XS/2.
> Y0=YS/2.
> XY0=X0<Y0
> R0=(1-pfree)*XY0
> R=R0*sqrt(3)
> Y0=Y0-0.25*R0
>
> dX=R*0.5
> dY=R0*0.5
> AP=[X0,Y0+R0]
> BP=[X0-dX,Y0-dY]
> CP=[X0+dX,Y0-dY]
>
> if keyword_set(GAP) then begin
>       ct=sqrt(3)*0.5
>
>       DR=(1-GAP)*XY0-R0
>       dX=dR*ct
>       dY=dR*0.5
>       dZ=dY*[ct,0.5]
>       dU=dY*[-ct,0.5]
>       dV=[0,-dY]
>
>       ArrowCoord=[[BP+dV],[CP+dV],[CP+dZ],$
>       [AP+dZ],[AP+dU],[BP+dU]]
> endif
>
> end;pro TriangleConstr
>
;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%
>
> pro
>  TernaryDiagram,Ain,Bin,Cin,ATitle=ATitle,BTitle=BTitle,CTitl e=CTitle
>
> ; ----Check primary parameters----
> if not keyword_set(ATitle) then ATitle='A'
> if not keyword_set(BTitle) then BTitle='B'
> if not keyword_set(CTitle) then CTitle='C'
>
> nA=n_elements(Ain)
> nB=n_elements(Bin)
> nC=n_elements(Cin)
>
> if (nA eq 0) or (nB eq 0) or (nC eq 0) or (nA ne nB) or (nA ne nC)
> then $
```

```
>         message,'A,B,C dimensions are wrong.'
>
>  ; ----Construct diagram----
>  pfree=0.02
>  gap=-0.1
>  gap2=-0.2
>  TriangleConstr,AP,BP,CP,pfree,R=R,GAP=gap,ArrowCoord=AC
>  TriangleConstr,APl,BPl,CPl,gap,GAP=gap2,ArrowCoord=AC2
>
>  plots,[BP[0],CP[0]],[BP[1],CP[1]],/device,thick=2
>  plots,[CP[0],AP[0]],[CP[1],AP[1]],/device,thick=2
>  plots,[AP[0],BP[0]],[AP[1],BP[1]],/device,thick=2
>  xyouts,BPl[0],BPl[1],BTitle,/device
>  xyouts,CPl[0],CPl[1],CTitle,/device
>  xyouts,APl[0],APl[1],ATitle,/device
>  arrow,AC[0,0],AC[1,0],AC[0,1],AC[1,1]
>  arrow,AC[0,2],AC[1,2],AC[0,3],AC[1,3]
>  arrow,AC[0,4],AC[1,4],AC[0,5],AC[1,5]
>
>  xyouts,(AC2[0,4]+AC2[0,5])/2,(AC2[1,4]+AC2[1,5])/2,BTitle+'
>  %',/device,ORIENTATION=60
>  xyouts,(AC2[0,0]+AC2[0,1])/2,(AC2[1,0]+AC2[1,1])/2,CTitle+'
>  %',/device,ORIENTATION=0
>  xyouts,(AC2[0,2]+AC2[0,3])/2,(AC2[1,2]+AC2[1,3])/2,ATitle+'
>  %',/device,ORIENTATION=-60
>
>  ; ----Derive coordinates----
>
>  ; sum must be 1, then scale between 0-R
>  sum=float(Ain+Bin+Cin)
>  Anorm=Ain/sum*R
>  Bnorm=Bin/sum*R
>  Cnorm=Cin/sum*R
>
>  data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
>  plots,data.x,data.y,psym=2,/device
>
>  ; ----Grid----
>  n=10
>  m=n-1
>  ind=(indgen(1,m)+1.)/n
>  rind=reverse(ind,2)
>  zero=replicate(0.,1,m)
>
>  ;CA
>  Anorm=[zero,ind]*R
>  Bnorm=[ind,zero]*R
>  Cnorm=[rind,rind]*R
```

> data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
> for i=0,m-1 do $
>   plots,data.x[*,i],data.y[*,i],linestyle=1,/device
>
> ;AB
> Anorm=[ind,ind]*R
> Bnorm=[zero,rind]*R
> Cnorm=[rind,zero]*R
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> for i=0,m-1 do $
>   plots,data.x[*,i],data.y[*,i],linestyle=1,/device
>
> ;BC
> Anorm=[rind,zero]*R
> Bnorm=[ind,ind]*R
> Cnorm=[zero,rind]*R
> data=NormToTriangle(Anorm,Bnorm,Cnorm,AP,BP,CP)
> for i=0,m-1 do $
>   plots,data.x[*,i],data.y[*,i],linestyle=1,/device
>
> end;pro TernaryDiagram
>
;%%
%%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%
>
> pro example
>
> window
> A=[20,50,25,20]
> B=[30,0,25,70]
> C=[50,50,50,10]
>
> TernaryDiagram,A,B,C
>
> end;pro example

Dear Wox, I knew that wouldnt be easy. As you showed :-O Thank you very much.
Robinson

Subject: Re: Ternary diagrams
Posted by nicholasehamilton on Thu, 19 Dec 2013 14:49:01 GMT
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Dear Eli,

I wanted to mention that I have just published on CRAN, a package for R, for the plotting of ternary diagrams.

It is based off ggplot2, which is highly regarded, and, my website can be viewed at www.ggtern.com, including many examples, specifically including a case study at the following address:

http://ggtern.com/case-study-zirconia-alumina-silica/

Hope you find it of value.

Best Regards,

Nicholas Hamilton
School of Materials Science and Engineering
Univesity of New South Wales
Sydney Australia
--
www.ggtern.com

On Friday, June 18, 2004 12:43:04 AM UTC+10, hunter wrote:
> Hi there,
>
> Hope you're all having a good day. I'm trying to generate a ternary diagram
> (Triangular coordinates) in IDL and can't seem to find much on the subject
> in the IDL help. I assume its something I'll have to built from scratch.
> However, I'd rather not reinvent the wheel. Has anybody had some experince
> in this area? or can someone please provide me with a good reference on the
> subject?
>
> Any help would be appreciated.
>
> Thanks,
> Eli