### 地球科学学院大气科学系《诊断分析与绘图实验》报告

### 实验五 绘制单线图

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| 姓名 | 学号 | 成绩 |
| 马群 | 20201170333 |  |

1. **目的：**

掌握单线图和散点图的绘制；练习各种相关资源的使用。

1. **方法：（见实验指导书）**
2. **回答习题（可逐题回答，也可以把执行的命令或脚本一次写完，把要说明的内容加成注释或在最后说明）：**

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| 使用uv300.nc数据，绘制1月45E、90E和135E的纬向风随纬度的变化图，对线型、颜色、粗细等图形属性进行设置，其中135E的纬向风变化用散点表示，并在图片右上角标注图例。 |
| begin  ;read data and process  f = addfile("nc/uv300.nc","r")  u = f->U  data1=u(0,:,{(/45,90,135/)})  data1!0 = "lat"  data1!1 = "lon"  data = data1(lon|:,lat|:)  x = u&lat  ;open workstation  wks = gsn\_open\_wks("eps","question1")  ;set plot  res = True  res@xyDashPatterns = (/0,5,1,3,4,17/);line patterns  res@xyLineThicknesses = (/1,2,3/);line thinknesses  ;res@xyLineColor = "blue";all line colors  res@xyLineColors = (/"red","grey","green","PapayaWhip","Khaki","HotPink","Orchid"/);not colormaps,just colors;and the color numbers are more than the data is fine; the colors can appear one more time.  res@xyMarkLineModes = (/"MarkLines","Lines","Markers"/);if you choose "Markers" to one line,the line color will be disable  res@xyMarkers = (/8,6,1/);types of markers  res@xyMarkerColors = (/"blue","yellow","red"/);markercolors  ;res@xyMarkerSizeF = 0.02;set all markersizes  res@xyMarkerSizes = (/0.01,0.015,0.02/);set every line's markersizes  ;legend  res@pmLegendDisplayMode = True  ;title  res@lgTitleOn = True  res@lgTitleString = "Different Longitude"  ;size  res@pmLegendWidthF = 0.16  res@pmLegendHeightF = 0.08  ;position  res@pmLegendOrthogonalPosF = -1.07  res@pmLegendParallelPosF = 0.845  res@xyExplicitLegendLabels = (/"45~F0~~S~o~N~E","90~F0~~S~o~N~E","135~F0~~S~o~N~E"/)  plot = gsn\_csm\_xy(wks,x,data,res)  end |
| 结果：  这一问主要都是相关参数的设置、例如线形、点形、点线结合、颜色、大小、粗细、图例等，主要是做到知道什么可以进行修改即可，现用现查。具体内容看注释即可、不再赘述。值得一说的是关于特殊符号的运用，像摄氏度、角度符号或者要更换新罗马字体等，都可以采用~F0~~S~o~N~C这类进行设置（具体的我忘了XD） |
| 用0710.grib数据绘制某格点的时间序列单线图，练习X轴为时间时的处理。 |
| begin  ;read data and process  f = addfile("nc/0404/0710.grib","r")  T = f->T\_GDS0\_ISBL(:,3,0,0)  ;printVarSummary(T)  T!0 = "time"  x = T&time  utc\_time = cd\_calendar(x, 4)  ;printVarSummary(x)  ;print(utc\_time)  ;time = utc\_time(:,0) \* 10000 + 10 \* (utc\_time(:,1)\*10 + utc\_time(:,2))  wks = gsn\_open\_wks("png","question2")  res = True  res@tmXBMode = "explicit"  res@tmXBLabelsOn = True  res@tmXBValues = (/2007,2008,2009,2010,2011,2012/)  res@tmXBLabels = (/2007.01,2008.01,2009.01,2010.01,2011.01,2012.01/)  res@xyLineThicknessF = 2  res@xyLineColor = "blue"  res@xyDashPattern = 9  res@pmLegendDisplayMode = True  ;title  res@lgTitleOn = True  res@lgTitleString = "Temperature"  res@lgTitleFontHeightF = 0.02  ;size  res@pmLegendWidthF = 0.1  res@pmLegendHeightF = 0.05  ;position  res@pmLegendOrthogonalPosF = -1.13  res@pmLegendParallelPosF = 0.9  res@xyExplicitLegendLabels = (/"T/K"/)  plot = gsn\_csm\_xy(wks,utc\_time,T,res)  end |
| 结果：  这一问重点在于时间维的处理，这里选择的数据是700hPa处北纬45°东经90°的07年至12年的温度。时间同样是标准时，没有采用实验三的结果进行分析，而是尝试使用cd\_calendar()函数进行时间转换，感觉不如直接使用文件中的initial\_time0\_encoded变量更为方便。  值得一说的是图例中的字体大小，找了许久也没有找到相关的属性，最多只能改图例标题，故只得让它这样。PS:看起来很丑（ |

1. **实验小结（本次实验收获的经验、教训、感受等）：**

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| 这个周末好忙，故本次实验只是跑了一遍常见的参数，没有去深究。第二问在解决时间维度处理的问题后也没有做过多的设置，希望以后不要这么忙啦（ |