程序源代码：

clc

% set constant number%

a=3.893

b=11.688

c=3.820

CuLambda=1.54178

h=0:1:7

k=h

l=h

% calculate d theta%

d=zeros(1,512)

hre=zeros(1,512)

kre=zeros(1,512)

lre=zeros(1,512)

for i1=1:8

for i2=1:8

for i3=1:8

intermid=h(1,i1)^2/a^2+k(1,i2)^2/b^2+l(1,i3)^2/c^2

d(64\*(i1-1)+8\*(i2-1)+i3)=sqrt(1/intermid)

hre(1,64\*(i1-1)+8\*(i2-1)+i3)=h(1,i1)

kre(1,(64\*(i1-1)+8\*(i2-1)+i3))=k(1,i2)

lre(1,(64\*(i1-1)+8\*(i2-1)+i3))=l(1,i3)

end

end

end

dd=d

%按照d顺序进行排序%

d=sort(d,'descend')

%将不满足theta角要求的d值去除%

for i1=1:512

if d(1,i1)<CuLambda/2

d(1,i1)=0

end

end

d(d==0)=[]

d(d==inf)=[]

%计算得到此时hkl值,并将其与排序后的d值进行一一对应%

hhh=zeros(1,178)

kkk=zeros(1,178)

lll=zeros(1,178)

for i1=1:178

for i2=1:512

if d(1,i1)==dd(1,i2)

hhh(1,i1)=hre(1,i2)

kkk(1,i1)=kre(1,i2)

lll(1,i1)=lre(1,i2)

end

end

end

hkl=[hhh;kkk;lll]

%计算得到衍射theta值,以弧度制rad表示（其实主要是我忘了角度值怎么表达）%

theta=asin(CuLambda/2./d)

theta\_deree=rad2deg(theta)

%由theta计算角因子LP%

syms jiaodu

LP(jiaodu)=(1+(cos(2\*jiaodu))^2)/(cos(jiaodu)\*sin(jiaodu)\*sin(jiaodu))

LP\_theta=zeros(1,178)

for i1=1:178

LP\_theta(1,i1)=eval(LP(theta(1,i1)))

end

%计算原子散射因子f%

%输入查阅的a，b，c常数%

%参阅了国际晶体学手册，但是未能成功找到f因子常数%

%在国外的一个晶体学教学网站ruppweb上找到了查阅方法%

%如下将Y的参数列入下，假定B=100（Debye factor)，occupancy=1.0%

%将网站网址提供如下http://www.ruppweb.org/new\_comp/scattering\_factors.htm%

%a1 b1 a2 b2 a3 b3 a4 b4 c%

fi\_const=[17.9268,1.35417,9.15310,11.2145,1.76795,22.6599,-33.108,-0.01319,40.2602;

20.1807,3.21367,19.1136,0.283310,10.9054,20.0558,0.77634,51.7460,3.0292;

11.8168,3.37484,7.11181,0.244078,5.78135,7.98760,1.14523,19.8970,1.14431;

4.19160,12.8573,1.63969,4.17236,1.52673,47.0179,-20.307,-0.01404,21.9412]

%计算结构因子F\_hkl的平方，（变量名未显示平方符号）%

%f%

%此处的uvw为Ba面缺氧时候的情况，Cu面缺氧只需要将uvw换为Cu面缺氧数据，即将表单中1改为2%

%表单已经在作业压缩包中上传，运行时可能需要改一下路径%

uvw=xlsread('D:\all study and no paly make Jack a dull boy\2020 秋\X光衍射\ITC\原子位置.xlsx',1)

F\_hkl=zeros(1,178)

for inter\_i=1:178

f\_Y=0

f\_Ba=0

f\_Cu=0

f\_O=0

theL=sin(theta(1,inter\_i))/CuLambda

for i=1:2:7

f\_Y=f\_Y+fi\_const(1,i)\*exp(-(theL^2)\*fi\_const(1,i+1))+fi\_const(1,9)/4

f\_Ba=f\_Ba+fi\_const(2,i)\*exp(-theL^2\*fi\_const(2,1+i))+fi\_const(2,9)/4

f\_Cu=f\_Cu+fi\_const(3,i)\*exp(-theL^2\*fi\_const(3,1+i))+fi\_const(3,9)/4

f\_O=f\_O+fi\_const(4,i)\*exp(-theL^2\*fi\_const(4,1+i))+fi\_const(4,9)/4

end

f\_hkl=[f\_Y,f\_Ba,f\_Ba,f\_Cu,f\_Cu,f\_Cu,f\_O,f\_O,f\_O,f\_O,f\_O,f\_O,f\_O]

inter\_hkl=hkl(:,inter\_i)'

mid=0

endo=0

for i=1:13

for j=1:13

mid=cos(2\*pi()\*sum((uvw(i,:)-uvw(j,:)).\*inter\_hkl))

endo=endo+f\_hkl(1,i)\*f\_hkl(1,j)\*(mid)

sum((uvw(i,:)-uvw(j,:)).\*inter\_hkl)

end

end

F\_hkl(1,inter\_i)=endo

end

%该部分输出较多，故未在实时演示区展示%

%输入多重因子P，（正交晶系）%

%以逻辑判断方法输入多重因子P%

P=zeros(1,178)

for inter\_i=1:178

P(1,inter\_i)=P\_function(hkl(1,inter\_i),hkl(2,inter\_i),hkl(3,inter\_i))

end

%计算I值%

I\_result=(LP\_theta.\*F\_hkl.\*P)

%考虑角度分辨率为0.05，合并相邻比较近的theta角%

for i=1:173

j=1

if theta\_deree(1,i+j)-theta\_deree(1,i)<=0.025

I\_result(1,i)=I\_result(1,i)+I\_result(1,i+j)

I\_result(1,i+j)=-1

j=j+1;

end

if theta\_deree(1,i+j)-theta\_deree(1,i)<=0.025

I\_result(1,i)=I\_result(1,i)+I\_result(1,i+j)

I\_result(1,i+j)=-1

j=j+1;

end

if theta\_deree(1,i+j)-theta\_deree(1,i)<=0.025

I\_result(1,i)=I\_result(1,i)+I\_result(1,i+j)

I\_result(1,i+j)=-1

j=j+1;

end

end

%计算I最大值，计算I相对强度，取Imax为100作为参比%

I\_max=max(I\_result)

I\_rel=I\_result/I\_max\*100

I\_rel=I\_rel'

theta\_deree=theta\_deree'\*2

F\_hkl=F\_hkl'

P=P'

LP\_theta=LP\_theta'

hkl=hkl'

Ba面缺O计算结果：

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| h | k | l | 2\theta(°） | LP | F^2 | P | I\_相对 |
| 0 | 1 | 0 | 7.56345 | 456.7660489 | 80.29665713 | 2 | 1.324785438 |
| 0 | 2 | 0 | 15.16011 | 111.9867127 | 77.69450968 | 2 | 0.314275909 |
| 0 | 3 | 0 | 22.82451 | 48.19322505 | 402.0754667 | 2 | 9.068827082 |
| 1 | 0 | 0 | 22.84234 | 48.11475577 | 2407.721484 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 0 | 1 | 23.28490 | 46.22413647 | 2392.431518 | 4 | 7.989002967 |
| 1 | 1 | 0 | 24.09410 | 43.0336959 | 518.7285334 | 4 | 1.612623724 |
| 0 | 1 | 1 | 24.51533 | 41.49693794 | 513.5946374 | 4 | 1.539645696 |
| 1 | 2 | 0 | 27.52921 | 32.48742875 | 477.7140273 | 4 | 1.121159999 |
| 0 | 2 | 1 | 27.90199 | 31.5722186 | 473.4014607 | 4 | 1.079739415 |
| 0 | 4 | 0 | 30.59402 | 25.93177067 | 70.15289513 | 2 | 0.065710086 |
| 1 | 3 | 0 | 32.51254 | 22.74503371 | 35541.97611 | 4 | 58.39994203 |
| 0 | 3 | 1 | 32.83370 | 22.26605463 | 35379.84654 | 4 | 100 |
| 1 | 0 | 1 | 32.84646 | 22.24732433 | 26811.50521 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 1 | 33.75442 | 20.96885647 | 68.72873108 | 8 | 0.208222343 |
| 1 | 2 | 1 | 36.35826 | 17.82629316 | 67.66632319 | 8 | 0.174280132 |
| 0 | 5 | 0 | 38.51065 | 15.70366649 | 66.87399541 | 2 | 0.453153571 |
| 1 | 4 | 0 | 38.52176 | 15.6936473 | 366.2445173 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 4 | 1 | 38.79929 | 15.44617394 | 363.8820245 | 4 | 0.406037162 |
| 1 | 3 | 1 | 40.37471 | 14.13926659 | 7329.510754 | 8 | 14.97325172 |
| 1 | 5 | 0 | 45.24563 | 10.95113571 | 315.0100598 | 4 | 0.249211365 |
| 0 | 5 | 1 | 45.48926 | 10.81908547 | 313.375985 | 4 | 0.346265767 |
| 1 | 4 | 1 | 45.49896 | 10.81387457 | 64.8590673 | 8 | 小于角分辨度合并至上一栏 |
| 0 | 6 | 0 | 46.62353 | 10.23271429 | 43044.20424 | 2 | 47.64712269 |
| 2 | 0 | 0 | 46.66158 | 10.21382032 | 43013.05425 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 0 | 47.34316 | 9.883544371 | 64.46013697 | 4 | 0.046024407 |
| 0 | 0 | 2 | 47.60777 | 9.759357012 | 42247.2133 | 4 | 29.78540663 |
| 0 | 1 | 2 | 48.27916 | 9.453941252 | 64.27600598 | 4 | 0.043898132 |
| 2 | 2 | 0 | 49.34484 | 8.996182978 | 64.08010602 | 4 | 0.041645278 |
| 0 | 2 | 2 | 50.25283 | 8.630533386 | 63.92384565 | 4 | 0.039855182 |
| 1 | 5 | 1 | 51.49232 | 8.164671562 | 63.72480753 | 8 | 0.075172935 |
| 1 | 6 | 0 | 52.52858 | 7.802374713 | 1643.430882 | 4 | 1.237457067 |
| 2 | 3 | 0 | 52.55472 | 7.79353674 | 552.6224676 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 6 | 1 | 52.74671 | 7.729071501 | 1640.451957 | 4 | 1.830278071 |
| 2 | 0 | 1 | 52.78147 | 7.717484788 | 1639.980448 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 1 | 53.40489 | 7.513846966 | 267.475488 | 8 | 1.477380408 |
| 0 | 3 | 2 | 53.42322 | 7.5079779 | 557.7794147 | 4 | -3.61E-05 |
| 1 | 0 | 2 | 53.43183 | 7.505222498 | 1631.312045 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 2 | 54.05004 | 7.311241511 | 264.2825826 | 8 | 0.279173331 |
| 0 | 7 | 0 | 54.99240 | 7.029396066 | 63.23366941 | 2 | 0.016055383 |
| 2 | 2 | 1 | 55.24590 | 6.956310044 | 258.5541167 | 8 | 0.259863117 |
| 1 | 2 | 2 | 55.87657 | 6.779306025 | 255.6289046 | 8 | 0.250385661 |
| 2 | 4 | 0 | 56.83162 | 6.523799433 | 63.00470698 | 4 | 0.029693258 |
| 0 | 4 | 2 | 57.65627 | 6.314686327 | 62.90585824 | 4 | 0.028696381 |
| 1 | 6 | 1 | 58.20267 | 6.181701184 | 19608.28913 | 8 | 39.08254907 |
| 2 | 3 | 1 | 58.22708 | 6.175860001 | 24172.86994 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 3 | 2 | 58.83690 | 6.032670351 | 23957.54442 | 8 | 20.88171445 |
| 1 | 7 | 0 | 60.31299 | 5.706745981 | 236.7542405 | 4 | 0.097604663 |
| 0 | 7 | 1 | 60.51237 | 5.664859944 | 235.970566 | 4 | 0.096567563 |
| 2 | 5 | 0 | 62.04366 | 5.358994609 | 62.38883072 | 4 | 0.024153186 |
| 2 | 4 | 1 | 62.24758 | 5.320295706 | 229.3620567 | 8 | 0.176307831 |
| 0 | 5 | 2 | 62.82598 | 5.213010067 | 62.29389532 | 4 | 0.194546286 |
| 1 | 4 | 2 | 62.83375 | 5.211592424 | 227.2122953 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 7 | 1 | 65.55546 | 4.752897688 | 61.9441465 | 8 | 0.042537601 |
| 2 | 5 | 1 | 67.21035 | 4.507666182 | 212.3498034 | 8 | 0.138298626 |
| 1 | 5 | 2 | 67.77336 | 4.429520785 | 210.5774332 | 8 | 0.134766772 |
| 2 | 6 | 0 | 68.09337 | 4.386246902 | 29388.58155 | 4 | 9.312278595 |
| 0 | 6 | 2 | 68.83891 | 4.288544697 | 29037.25038 | 4 | 17.97975742 |
| 2 | 0 | 2 | 68.86858 | 4.284745458 | 29023.41318 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 2 | 69.40205 | 4.217556319 | 61.37877848 | 8 | 0.037401876 |
| 2 | 2 | 2 | 70.99158 | 4.029593377 | 61.11335639 | 8 | 0.035580465 |
| 3 | 0 | 0 | 72.89110 | 3.827420625 | 1470.615196 | 4 | 0.406620718 |
| 2 | 6 | 1 | 73.04349 | 3.812198003 | 1469.843579 | 8 | 0.809581966 |
| 3 | 1 | 0 | 73.41195 | 3.775980118 | 194.3197335 | 4 | 0.053006712 |
| 1 | 6 | 2 | 73.58648 | 3.75911179 | 1467.127235 | 8 | 1.164698831 |
| 2 | 3 | 2 | 73.60811 | 3.757033799 | 677.6885816 | 8 | 小于角分辨度合并至上一栏 |
| 0 | 0 | 3 | 74.51685 | 3.672237003 | 1462.586488 | 4 | 0.388004283 |
| 2 | 7 | 0 | 74.93046 | 3.635223352 | 60.36278715 | 4 | 0.065774163 |
| 3 | 2 | 0 | 74.96627 | 3.63206388 | 190.2634964 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 1 | 3 | 75.03347 | 3.626155304 | 190.0918563 | 4 | 0.049795967 |
| 0 | 7 | 2 | 75.64747 | 3.573330591 | 60.21125833 | 4 | 0.015543011 |
| 0 | 2 | 3 | 76.57609 | 3.497323616 | 186.2329101 | 4 | 0.047051829 |
| 2 | 4 | 2 | 77.21439 | 3.447706026 | 59.86391812 | 8 | 0.029820136 |
| 3 | 3 | 0 | 77.53248 | 3.423757152 | 18523.19113 | 4 | 4.581450734 |
| 3 | 0 | 1 | 77.71706 | 3.41009325 | 15452.55774 | 4 | 3.806719623 |
| 3 | 1 | 1 | 78.22675 | 3.373240116 | 59.6277673 | 8 | 0.029060967 |
| 0 | 3 | 3 | 79.12585 | 3.31129822 | 18152.26882 | 4 | 7.978132173 |
| 1 | 0 | 3 | 79.13290 | 3.310828129 | 15201.64267 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 3 | 79.64007 | 3.277587534 | 59.28293411 | 8 | 0.028073609 |
| 2 | 7 | 1 | 79.71516 | 3.272766714 | 178.8318719 | 8 | 0.112561813 |
| 3 | 2 | 1 | 79.75031 | 3.270519185 | 59.25530559 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 7 | 2 | 80.24335 | 3.239585263 | 177.6421826 | 8 | 0.08314761 |
| 3 | 4 | 0 | 81.08413 | 3.189337826 | 175.7796411 | 4 | 0.040499845 |
| 1 | 2 | 3 | 81.15683 | 3.185138844 | 58.89377283 | 8 | 0.027102665 |
| 2 | 5 | 2 | 81.77847 | 3.150160731 | 58.72875514 | 8 | 0.026729927 |
| 3 | 3 | 1 | 82.27395 | 3.123453378 | 3578.803619 | 8 | 1.615054387 |
| 0 | 4 | 3 | 82.66040 | 3.103331554 | 172.3877133 | 4 | 0.038647263 |
| 1 | 3 | 3 | 83.67149 | 3.053553078 | 3528.743541 | 8 | 1.556825104 |
| 3 | 5 | 0 | 85.60217 | 2.969586234 | 166.3854403 | 4 | 0.035694025 |
| 3 | 4 | 1 | 85.78297 | 2.962441592 | 57.59476149 | 8 | 0.024651709 |
| 0 | 5 | 3 | 87.16571 | 2.911716538 | 163.35821 | 4 | 0.058412867 |
| 1 | 4 | 3 | 87.17264 | 2.911479611 | 57.17532106 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 6 | 2 | 87.28904 | 2.907522602 | 22220.94054 | 8 | 9.334687702 |
| 3 | 5 | 1 | 90.27320 | 2.821804133 | 56.1997445 | 8 | 0.022912657 |
| 3 | 6 | 0 | 91.08995 | 2.803424708 | 1394.332105 | 4 | 0.282383544 |
| 1 | 5 | 3 | 91.66043 | 2.791831804 | 55.74831227 | 8 | 0.022487192 |
| 3 | 0 | 2 | 91.81136 | 2.788933846 | 1391.563956 | 4 | 0.280366193 |
| 3 | 1 | 2 | 92.31017 | 2.779853881 | 154.1253603 | 8 | 0.061902805 |
| 0 | 6 | 3 | 92.65121 | 2.774082494 | 1388.34111 | 4 | 0.556387931 |
| 2 | 0 | 3 | 92.67891 | 2.773629205 | 1388.234797 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 3 | 93.17806 | 2.765856137 | 152.6706719 | 8 | 0.06100978 |
| 2 | 7 | 2 | 93.77316 | 2.757559296 | 55.04692578 | 8 | 0.082335038 |
| 3 | 2 | 2 | 93.80782 | 2.757108304 | 151.632709 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 2 | 3 | 94.67709 | 2.746946815 | 150.2239043 | 8 | 0.05962159 |
| 3 | 6 | 1 | 95.76632 | 2.737289577 | 12692.13462 | 8 | 5.019606462 |
| 3 | 3 | 2 | 96.31022 | 2.733726816 | 14867.01153 | 8 | 5.872094652 |
| 1 | 6 | 3 | 97.16224 | 2.729806303 | 12515.29643 | 8 | 10.74590136 |
| 2 | 3 | 3 | 97.18315 | 2.729735341 | 14730.71067 | 8 | 小于角分辨度合并至上一栏 |
| 3 | 7 | 0 | 97.59247 | 2.728588678 | 145.6949705 | 4 | 0.02871884 |
| 0 | 7 | 3 | 99.16974 | 2.728431821 | 143.3659512 | 4 | 0.028258128 |
| 3 | 4 | 2 | 99.83514 | 2.730369027 | 142.4080778 | 8 | 0.056178512 |
| 2 | 4 | 3 | 100.71615 | 2.734737856 | 141.1618701 | 8 | 0.055776 |
| 3 | 7 | 1 | 102.33197 | 2.74802873 | 52.12062598 | 8 | 0.020694034 |
| 1 | 7 | 3 | 103.75575 | 2.765333127 | 51.63325302 | 8 | 0.020629619 |
| 3 | 5 | 2 | 104.42524 | 2.775264785 | 136.1822235 | 8 | 0.054605841 |
| 4 | 0 | 0 | 104.76028 | 2.780664018 | 18171.33097 | 4 | 3.650224002 |
| 4 | 1 | 0 | 105.27640 | 2.789540277 | 51.11594425 | 4 | 0.064743494 |
| 2 | 5 | 3 | 105.32218 | 2.79036028 | 135.0406831 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 2 | 0 | 106.83261 | 2.820397046 | 50.59122799 | 4 | 0.010307889 |
| 0 | 0 | 4 | 107.64936 | 2.839048238 | 17658.34642 | 4 | 3.621654899 |
| 0 | 1 | 4 | 108.17325 | 2.851901843 | 50.14391614 | 4 | 0.010330874 |
| 4 | 3 | 0 | 109.45571 | 2.886309651 | 765.2880111 | 4 | 0.159570311 |
| 4 | 0 | 1 | 109.64704 | 2.891801727 | 1322.150803 | 4 | 0.276206419 |
| 0 | 2 | 4 | 109.75460 | 2.894930322 | 49.6229149 | 4 | 0.010377784 |
| 3 | 6 | 2 | 110.17080 | 2.907314897 | 1320.093229 | 8 | 0.60881296 |
| 4 | 1 | 1 | 110.17723 | 2.907509615 | 129.2624116 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 6 | 3 | 111.09711 | 2.936472001 | 1316.457322 | 8 | 0.558530514 |
| 4 | 2 | 1 | 111.77891 | 2.959344824 | 127.4984899 | 8 | 0.054514856 |
| 0 | 3 | 4 | 112.42624 | 2.982176375 | 764.8310395 | 4 | 0.447281141 |
| 1 | 0 | 4 | 112.43372 | 2.982446697 | 1311.220535 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 4 | 112.97409 | 3.002353178 | 126.2263065 | 8 | 0.054755268 |
| 4 | 4 | 0 | 113.20239 | 3.010993721 | 48.51661778 | 4 | 0.010553211 |
| 4 | 3 | 1 | 114.48957 | 3.062288587 | 12513.30366 | 8 | 5.536462413 |
| 1 | 2 | 4 | 114.60850 | 3.06725085 | 124.5460396 | 8 | 0.055194204 |
| 3 | 0 | 3 | 116.03092 | 3.129560683 | 10560.91993 | 4 | 2.387642978 |
| 0 | 4 | 4 | 116.25685 | 3.139965572 | 47.57633906 | 4 | 0.010791956 |
| 3 | 1 | 3 | 116.58701 | 3.155424347 | 47.47717649 | 8 | 0.021644966 |
| 3 | 7 | 2 | 117.25321 | 3.187539662 | 121.9682187 | 8 | 0.056171566 |
| 1 | 3 | 4 | 117.38177 | 3.193879746 | 12221.71947 | 8 | 5.639818495 |
| 4 | 5 | 0 | 118.18259 | 3.234430316 | 47.00515244 | 4 | 0.010983165 |
| 2 | 7 | 3 | 118.23270 | 3.237028369 | 121.0564696 | 8 | 0.07860288 |
| 3 | 2 | 3 | 118.27196 | 3.239069197 | 46.97907282 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 4 | 1 | 118.38733 | 3.245091317 | 120.9146099 | 8 | 0.056691762 |
| 3 | 3 | 3 | 121.14186 | 3.400507633 | 2715.174436 | 8 | 1.333999744 |
| 0 | 5 | 4 | 121.37912 | 3.414966571 | 46.09699685 | 4 | 0.069736263 |
| 1 | 4 | 4 | 121.38723 | 3.415463441 | 118.2719726 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 5 | 1 | 123.62345 | 3.560576067 | 116.4334377 | 8 | 0.059897989 |
| 4 | 6 | 0 | 124.60993 | 3.629821576 | 15304.19214 | 4 | 4.013099685 |
| 3 | 4 | 3 | 125.31428 | 3.681310782 | 45.05152203 | 8 | 0.023962173 |
| 4 | 0 | 2 | 125.49087 | 3.694493098 | 15208.12079 | 4 | 4.058959082 |
| 4 | 1 | 2 | 126.10547 | 3.741243537 | 44.85131575 | 8 | 0.024244064 |
| 1 | 5 | 4 | 126.80705 | 3.796294562 | 114.0004187 | 8 | 0.062528874 |
| 4 | 2 | 2 | 127.97913 | 3.892404239 | 44.39077002 | 8 | 0.024964615 |
| 0 | 6 | 4 | 128.05386 | 3.898712503 | 14941.28514 | 4 | 8.418558136 |
| 2 | 0 | 4 | 128.08901 | 3.901686926 | 14937.75406 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 4 | 128.72515 | 3.956373261 | 44.21273831 | 8 | 0.025273124 |
| 4 | 6 | 1 | 130.49907 | 4.117694852 | 1244.017046 | 8 | 0.740107401 |
| 2 | 2 | 4 | 130.66885 | 4.133842165 | 43.76323656 | 8 | 0.026138315 |
| 3 | 5 | 3 | 131.02313 | 4.167952321 | 43.68353945 | 8 | 0.026306 |
| 4 | 3 | 2 | 131.21420 | 4.186582012 | 749.6601058 | 8 | 0.453459244 |
| 4 | 7 | 0 | 132.92890 | 4.361408177 | 43.26665835 | 4 | 0.01363215 |
| 1 | 6 | 4 | 134.01331 | 4.479435113 | 1232.297866 | 8 | 1.280980028 |
| 2 | 3 | 4 | 134.04217 | 4.482659457 | 746.4339791 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 4 | 2 | 136.03616 | 4.716461185 | 42.6295193 | 8 | 0.029049653 |
| 0 | 7 | 4 | 136.84499 | 4.8178526 | 42.47225951 | 4 | 0.014782338 |
| 3 | 6 | 3 | 138.76975 | 5.075856023 | 9093.314944 | 8 | 6.668770687 |
| 2 | 4 | 4 | 139.12068 | 5.125604199 | 42.04862157 | 8 | 0.031139461 |
| 4 | 7 | 1 | 139.68861 | 5.207996421 | 106.1453695 | 8 | 0.079870423 |
| 4 | 5 | 2 | 142.94722 | 5.730305888 | 41.39786269 | 8 | 0.03427441 |
| 1 | 7 | 4 | 143.89411 | 5.899839113 | 104.1939293 | 8 | 0.088817152 |
| 2 | 5 | 4 | 146.55263 | 6.426766132 | 40.85345359 | 8 | 0.037934602 |
| 3 | 7 | 3 | 149.90224 | 7.22113526 | 40.40538036 | 8 | 0.042155955 |
| 4 | 6 | 2 | 153.35267 | 8.243557704 | 13160.71878 | 8 | 15.67503602 |
| 2 | 6 | 4 | 158.44975 | 10.33740493 | 12959.46262 | 8 | 19.35587362 |
| 5 | 0 | 0 | 163.86026 | 13.97186294 | 1163.056454 | 4 | 1.173922354 |
| 5 | 1 | 0 | 165.76303 | 15.89525556 | 97.97262149 | 4 | 0.112501031 |
| 4 | 0 | 3 | 171.04848 | 25.47363385 | 1155.966852 | 4 | 2.12725985 |
| 5 | 2 | 0 | 174.49497 | 41.55175103 | 97.0634445 | 4 | 0.291359571 |
| 4 | 1 | 3 | 175.21906 | 47.86751192 | 97.02455802 | 8 | 0.671022038 |

Cu面缺O计算结果

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| h | k | l | 2\theta(°） | LP | F^2 | P | I\_相对 |
| 0 | 1 | 0 | 7.563454787 | 456.7660489 | 0.042009474 | 2 | 0.00064998 |
| 0 | 2 | 0 | 15.16011322 | 111.9867127 | 1100.489217 | 2 | 4.174561734 |
| 0 | 3 | 0 | 22.82451432 | 48.19322505 | 2408.33713 | 2 | 7.825088332 |
| 1 | 0 | 0 | 22.84233984 | 48.11475577 | 1194.481765 | 4 | 小于角分辨度 合并至上一栏 |
| 0 | 0 | 1 | 23.2849046 | 46.22413647 | 1190.969387 | 4 | 3.729563456 |
| 1 | 1 | 0 | 24.09409805 | 43.0336959 | 245.5786075 | 4 | 0.715958377 |
| 0 | 1 | 1 | 24.51533352 | 41.49693794 | 243.6152511 | 4 | 0.684871541 |
| 1 | 2 | 0 | 27.52920886 | 32.48742875 | 229.8383028 | 4 | 0.505855343 |
| 0 | 2 | 1 | 27.90199375 | 31.5722186 | 228.1761263 | 4 | 0.488049531 |
| 0 | 4 | 0 | 30.59402123 | 25.93177067 | 750.352591 | 2 | 0.659107356 |
| 1 | 3 | 0 | 32.51254275 | 22.74503371 | 31075.75899 | 4 | 47.88471701 |
| 0 | 3 | 1 | 32.83370108 | 22.26605463 | 30949.41701 | 4 | 100 |
| 1 | 0 | 1 | 32.84645657 | 22.24732433 | 35373.40964 | 4 | 小于角分辨度 合并至上一栏 |
| 1 | 1 | 1 | 33.75441542 | 20.96885647 | 688.5760942 | 8 | 1.956344254 |
| 1 | 2 | 1 | 36.35826051 | 17.82629316 | 6.364109248 | 8 | 0.015371536 |
| 0 | 5 | 0 | 38.51065229 | 15.70366649 | 7.270999636 | 2 | 0.202181404 |
| 1 | 4 | 0 | 38.52176014 | 15.6936473 | 186.5263637 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 4 | 1 | 38.79929252 | 15.44617394 | 185.602781 | 4 | 0.194220021 |
| 1 | 3 | 1 | 40.37470502 | 14.13926659 | 7329.510754 | 8 | 14.04172492 |
| 1 | 5 | 0 | 45.24562551 | 10.95113571 | 166.4833276 | 4 | 0.123514659 |
| 0 | 5 | 1 | 45.48925848 | 10.81908547 | 165.8439154 | 4 | 0.13684274 |
| 1 | 4 | 1 | 45.49895767 | 10.81387457 | 10.43270115 | 8 | 小于角分辨度合并至上一栏 |
| 0 | 6 | 0 | 46.62353001 | 10.23271429 | 43044.20424 | 2 | 44.68286532 |
| 2 | 0 | 0 | 46.66158474 | 10.21382032 | 43013.05425 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 0 | 47.34316243 | 9.883544371 | 11.30653788 | 4 | 0.007570611 |
| 0 | 0 | 2 | 47.60776933 | 9.759357012 | 42247.2133 | 4 | 27.9323753 |
| 0 | 1 | 2 | 48.27915539 | 9.453941252 | 11.75376082 | 4 | 0.007527978 |
| 2 | 2 | 0 | 49.3448361 | 8.996182978 | 462.8339752 | 4 | 0.282079878 |
| 0 | 2 | 2 | 50.25282957 | 8.630533386 | 453.2254257 | 4 | 0.26499672 |
| 1 | 5 | 1 | 51.49232195 | 8.164671562 | 440.6222327 | 8 | 0.487442865 |
| 1 | 6 | 0 | 52.52858094 | 7.802374713 | 1025.404932 | 4 | 1.409534983 |
| 2 | 3 | 0 | 52.55472339 | 7.79353674 | 1643.072095 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 6 | 1 | 52.74671482 | 7.729071501 | 1025.106278 | 4 | 1.072702641 |
| 2 | 0 | 1 | 52.7814683 | 7.717484788 | 1025.059931 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 1 | 53.40488619 | 7.513846966 | 147.8648261 | 8 | 1.501134702 |
| 0 | 3 | 2 | 53.42321706 | 7.5079779 | 1631.424938 | 4 | -3.39E-05 |
| 1 | 0 | 2 | 53.43183021 | 7.505222498 | 1024.254289 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 2 | 54.05003875 | 7.311241511 | 146.6098056 | 8 | 0.145235485 |
| 0 | 7 | 0 | 54.99239791 | 7.029396066 | 14.97368989 | 2 | 0.003565377 |
| 2 | 2 | 1 | 55.24590416 | 6.956310044 | 144.3546697 | 8 | 0.13605934 |
| 1 | 2 | 2 | 55.87656983 | 6.779306025 | 143.2010038 | 8 | 0.131537594 |
| 2 | 4 | 0 | 56.8316242 | 6.523799433 | 392.4691281 | 4 | 0.173458145 |
| 0 | 4 | 2 | 57.65626579 | 6.314686327 | 385.8337967 | 4 | 0.165059545 |
| 1 | 6 | 1 | 58.20267165 | 6.181701184 | 24181.54514 | 8 | 38.51919904 |
| 2 | 3 | 1 | 58.22708464 | 6.175860001 | 21827.7289 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 3 | 2 | 58.83689826 | 6.032670351 | 21645.84806 | 8 | 17.69305353 |
| 1 | 7 | 0 | 60.31299434 | 5.706745981 | 135.704471 | 4 | 0.052465195 |
| 0 | 7 | 1 | 60.5123675 | 5.664859944 | 135.3905237 | 4 | 0.051959629 |
| 2 | 5 | 0 | 62.04366347 | 5.358994609 | 18.17440835 | 4 | 0.006598302 |
| 2 | 4 | 1 | 62.24758301 | 5.320295706 | 132.7312305 | 8 | 0.095681392 |
| 0 | 5 | 2 | 62.82597566 | 5.213010067 | 18.50481491 | 4 | 0.099647204 |
| 1 | 4 | 2 | 62.83375088 | 5.211592424 | 131.8610184 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 7 | 1 | 65.55546163 | 4.752897688 | 331.1881548 | 8 | 0.213280845 |
| 2 | 5 | 1 | 67.21034591 | 4.507666182 | 125.7537319 | 8 | 0.076805305 |
| 1 | 5 | 2 | 67.7733627 | 4.429520785 | 125.0124598 | 8 | 0.07502891 |
| 2 | 6 | 0 | 68.09336558 | 4.386246902 | 29388.58155 | 4 | 8.732936362 |
| 0 | 6 | 2 | 68.8389116 | 4.288544697 | 29037.25038 | 4 | 16.86118771 |
| 2 | 0 | 2 | 68.86857829 | 4.284745458 | 29023.41318 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 2 | 69.40205387 | 4.217556319 | 20.99567491 | 8 | 0.011998013 |
| 2 | 2 | 2 | 70.99157509 | 4.029593377 | 301.2516135 | 8 | 0.164478523 |
| 3 | 0 | 0 | 72.89109702 | 3.827420625 | 1033.887572 | 4 | 0.268082277 |
| 2 | 6 | 1 | 73.04348792 | 3.812198003 | 1034.065574 | 8 | 0.534124035 |
| 3 | 1 | 0 | 73.41194712 | 3.775980118 | 118.0357562 | 4 | 0.030194781 |
| 1 | 6 | 2 | 73.58647801 | 3.75911179 | 1034.695766 | 8 | 1.2737993 |
| 2 | 3 | 2 | 73.60811019 | 3.757033799 | 1467.020062 | 8 | 小于角分辨度合并至上一栏 |
| 0 | 0 | 3 | 74.5168451 | 3.672237003 | 1035.757025 | 4 | 0.257677908 |
| 2 | 7 | 0 | 74.93045597 | 3.635223352 | 22.61537036 | 4 | 0.03417046 |
| 3 | 2 | 0 | 74.96627098 | 3.63206388 | 116.2350568 | 4 | 小于角分辨度合并至上一栏 |
| 0 | 1 | 3 | 75.03346958 | 3.626155304 | 116.158244 | 4 | 0.02853547 |
| 0 | 7 | 2 | 75.64746758 | 3.573330591 | 22.79050768 | 4 | 0.005517163 |
| 0 | 2 | 3 | 76.57608945 | 3.497323616 | 114.4173235 | 4 | 0.027109169 |
| 2 | 4 | 2 | 77.21439244 | 3.447706026 | 272.7776903 | 8 | 0.127425888 |
| 3 | 3 | 0 | 77.53248167 | 3.423757152 | 16970.48478 | 4 | 3.936278305 |
| 3 | 0 | 1 | 77.7170634 | 3.41009325 | 18479.57003 | 4 | 4.269202086 |
| 3 | 1 | 1 | 78.22674553 | 3.373240116 | 268.6351158 | 8 | 0.122780283 |
| 0 | 3 | 3 | 79.12585434 | 3.31129822 | 16644.90851 | 4 | 7.805102835 |
| 1 | 0 | 3 | 79.13289799 | 3.310828129 | 18150.65712 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 3 | 79.64006699 | 3.277587534 | 263.0556009 | 8 | 0.116820872 |
| 2 | 7 | 1 | 79.71516297 | 3.272766714 | 110.9980572 | 8 | 0.059694849 |
| 3 | 2 | 1 | 79.75031208 | 3.270519185 | 23.63620096 | 8 | 小于角分辨度合并至上一栏 |
| 1 | 7 | 2 | 80.24334935 | 3.239585263 | 110.4378378 | 8 | 0.048475902 |
| 3 | 4 | 0 | 81.0841329 | 3.189337826 | 109.5545624 | 4 | 0.023671163 |
| 1 | 2 | 3 | 81.15683026 | 3.185138844 | 23.86566704 | 8 | 0.010299604 |
| 2 | 5 | 2 | 81.77847273 | 3.150160731 | 23.95750178 | 8 | 0.010225695 |
| 3 | 3 | 1 | 82.27395366 | 3.123453378 | 3578.803619 | 8 | 1.514577452 |
| 0 | 4 | 3 | 82.66039602 | 3.103331554 | 107.9259376 | 4 | 0.022690424 |
| 1 | 3 | 3 | 83.67149155 | 3.053553078 | 3528.743541 | 8 | 1.459970771 |
| 3 | 5 | 0 | 85.60217117 | 2.969586234 | 104.9774832 | 4 | 0.021119357 |
| 3 | 4 | 1 | 85.78297485 | 2.962441592 | 24.41402156 | 8 | 0.009799586 |
| 0 | 5 | 3 | 87.16571334 | 2.911716538 | 103.4567966 | 4 | 0.03008088 |
| 1 | 4 | 3 | 87.17263904 | 2.911479611 | 24.52061183 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 6 | 2 | 87.28904358 | 2.907522602 | 22220.94054 | 8 | 8.753951337 |
| 3 | 5 | 1 | 90.27319835 | 2.821804133 | 227.5778139 | 8 | 0.087011244 |
| 3 | 6 | 0 | 91.08995151 | 2.803424708 | 1044.644036 | 4 | 0.198401898 |
| 1 | 5 | 3 | 91.66043495 | 2.791831804 | 223.6714373 | 8 | 0.084609352 |
| 3 | 0 | 2 | 91.81135912 | 2.788933846 | 1044.450525 | 4 | 0.197339799 |
| 3 | 1 | 2 | 92.31017398 | 2.779853881 | 98.67296489 | 8 | 0.037165394 |
| 0 | 6 | 3 | 92.65121265 | 2.774082494 | 1044.159196 | 4 | 0.39243429 |
| 2 | 0 | 3 | 92.67891163 | 2.773629205 | 1044.148382 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 3 | 93.17805573 | 2.765856137 | 97.89876435 | 8 | 0.036688114 |
| 2 | 7 | 2 | 93.77316049 | 2.757559296 | 24.71013141 | 8 | 0.045596907 |
| 3 | 2 | 2 | 93.80782259 | 2.757108304 | 97.34290305 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 2 | 3 | 94.67709102 | 2.746946815 | 96.58384644 | 8 | 0.035947885 |
| 3 | 6 | 1 | 95.76632412 | 2.737289577 | 14953.27078 | 8 | 5.545944673 |
| 3 | 3 | 2 | 96.3102225 | 2.733726816 | 13721.89081 | 8 | 5.082620263 |
| 1 | 6 | 3 | 97.16223854 | 2.729806303 | 14733.94586 | 8 | 10.47943984 |
| 2 | 3 | 3 | 97.18315398 | 2.729735341 | 13599.08691 | 8 | 小于角分辨度合并至上一栏 |
| 3 | 7 | 0 | 97.59246557 | 2.728588678 | 94.10781871 | 4 | 0.017396119 |
| 0 | 7 | 3 | 99.16974029 | 2.728431821 | 92.81329591 | 4 | 0.017155836 |
| 3 | 4 | 2 | 99.83513697 | 2.730369027 | 92.27673498 | 8 | 0.034137535 |
| 2 | 4 | 3 | 100.7161545 | 2.734737856 | 91.57506009 | 8 | 0.03393216 |
| 3 | 7 | 1 | 102.3319674 | 2.74802873 | 197.9990263 | 8 | 0.073722986 |
| 1 | 7 | 3 | 103.7557452 | 2.765333127 | 195.0891935 | 8 | 0.073096951 |
| 3 | 5 | 2 | 104.4252378 | 2.775264785 | 88.73115533 | 8 | 0.033365616 |
| 4 | 0 | 0 | 104.7602768 | 2.780664018 | 18171.33097 | 4 | 3.423133617 |
| 4 | 1 | 0 | 105.2763984 | 2.789540277 | 24.13482815 | 4 | 0.037858312 |
| 2 | 5 | 3 | 105.3221778 | 2.79036028 | 88.07031779 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 2 | 0 | 106.8326101 | 2.820397046 | 189.162065 | 4 | 0.036143724 |
| 0 | 0 | 4 | 107.649364 | 2.839048238 | 17658.34642 | 4 | 3.396341877 |
| 0 | 1 | 4 | 108.1732471 | 2.851901843 | 23.88001013 | 4 | 0.004613788 |
| 4 | 3 | 0 | 109.4557124 | 2.886309651 | 1322.902652 | 4 | 0.258677946 |
| 4 | 0 | 1 | 109.6470368 | 2.891801727 | 1024.804262 | 4 | 0.200769636 |
| 0 | 2 | 4 | 109.7545969 | 2.894930322 | 183.9630907 | 4 | 0.036079242 |
| 3 | 6 | 2 | 110.1707991 | 2.907314897 | 1023.879329 | 8 | 0.436687029 |
| 4 | 1 | 1 | 110.1772261 | 2.907509615 | 84.67608197 | 8 | 小于角分辨度合并至上一栏 |
| 2 | 6 | 3 | 111.0971087 | 2.936472001 | 1022.209149 | 8 | 0.406709409 |
| 4 | 2 | 1 | 111.7789104 | 2.959344824 | 83.62406868 | 8 | 0.033530919 |
| 0 | 3 | 4 | 112.4262395 | 2.982176375 | 1311.249815 | 4 | 0.47095243 |
| 1 | 0 | 4 | 112.4337229 | 2.982446697 | 1019.726711 | 4 | 小于角分辨度合并至上一栏 |
| 1 | 1 | 4 | 112.9740873 | 3.002353178 | 82.86089418 | 8 | 0.033707767 |
| 4 | 4 | 0 | 113.2023905 | 3.010993721 | 178.32744 | 4 | 0.036376141 |
| 4 | 3 | 1 | 114.4895688 | 3.062288587 | 11585.08144 | 8 | 4.80688573 |
| 1 | 2 | 4 | 114.608501 | 3.06725085 | 81.84734354 | 8 | 0.034015157 |
| 3 | 0 | 3 | 116.030919 | 3.129560683 | 12355.40716 | 4 | 2.619564127 |
| 0 | 4 | 4 | 116.2568475 | 3.139965572 | 173.7536655 | 4 | 0.036961319 |
| 3 | 1 | 3 | 116.5870135 | 3.155424347 | 173.2816276 | 8 | 0.074084761 |
| 3 | 7 | 2 | 117.2532149 | 3.187539662 | 80.28041645 | 8 | 0.034672392 |
| 1 | 3 | 4 | 117.3817653 | 3.193879746 | 11318.1125 | 8 | 4.897914031 |
| 4 | 5 | 0 | 118.1825927 | 3.234430316 | 22.8647997 | 4 | 0.005010185 |
| 2 | 7 | 3 | 118.2327006 | 3.237028369 | 79.7228451 | 8 | 0.044996758 |
| 3 | 2 | 3 | 118.2719643 | 3.239069197 | 22.85536718 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 4 | 1 | 118.3873312 | 3.245091317 | 79.63593766 | 8 | 0.035015039 |
| 3 | 3 | 3 | 121.1418643 | 3.400507633 | 2715.174436 | 8 | 1.251007984 |
| 0 | 5 | 4 | 121.3791243 | 3.414966571 | 22.52842418 | 4 | 0.041312754 |
| 1 | 4 | 4 | 121.387227 | 3.415463441 | 78.00955924 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 5 | 1 | 123.623452 | 3.560576067 | 76.87002155 | 8 | 0.037084793 |
| 4 | 6 | 0 | 124.6099256 | 3.629821576 | 15304.19214 | 4 | 3.763433816 |
| 3 | 4 | 3 | 125.3142766 | 3.681310782 | 22.12276482 | 8 | 0.011034699 |
| 4 | 0 | 2 | 125.4908651 | 3.694493098 | 15208.12079 | 4 | 3.806440175 |
| 4 | 1 | 2 | 126.1054673 | 3.741243537 | 22.04305496 | 8 | 0.011173941 |
| 1 | 5 | 4 | 126.8070463 | 3.796294562 | 75.35242987 | 8 | 0.038759285 |
| 4 | 2 | 2 | 127.9791274 | 3.892404239 | 159.3902213 | 8 | 0.084061706 |
| 0 | 6 | 4 | 128.0538591 | 3.898712503 | 14941.28514 | 4 | 7.894816689 |
| 2 | 0 | 4 | 128.0890058 | 3.901686926 | 14937.75406 | 4 | 小于角分辨度合并至上一栏 |
| 2 | 1 | 4 | 128.72515 | 3.956373261 | 21.78484204 | 8 | 0.011678048 |
| 4 | 6 | 1 | 130.4990749 | 4.117694852 | 981.7305343 | 8 | 0.547728135 |
| 2 | 2 | 4 | 130.6688459 | 4.133842165 | 156.7223065 | 8 | 0.08778156 |
| 3 | 5 | 3 | 131.0231339 | 4.167952321 | 156.3865676 | 8 | 0.088316283 |
| 4 | 3 | 2 | 131.2141976 | 4.186582012 | 1241.584973 | 8 | 0.70429506 |
| 4 | 7 | 0 | 132.9289002 | 4.361408177 | 21.39211358 | 4 | 0.006320756 |
| 1 | 6 | 4 | 134.0133063 | 4.479435113 | 974.2405606 | 8 | 1.339705767 |
| 2 | 3 | 4 | 134.0421681 | 4.482659457 | 1232.204111 | 8 | 小于角分辨度合并至上一栏 |
| 4 | 4 | 2 | 136.0361556 | 4.716461185 | 152.005858 | 8 | 0.097139347 |
| 0 | 7 | 4 | 136.8449876 | 4.8178526 | 21.05405215 | 4 | 0.006871915 |
| 3 | 6 | 3 | 138.76975 | 5.075856023 | 10615.27096 | 8 | 7.300606997 |
| 2 | 4 | 4 | 139.1206786 | 5.125604199 | 149.6345246 | 8 | 0.103919121 |
| 4 | 7 | 1 | 139.6886083 | 5.207996421 | 70.38666895 | 8 | 0.049668344 |
| 4 | 5 | 2 | 142.9472158 | 5.730305888 | 20.58653461 | 8 | 0.015983786 |
| 1 | 7 | 4 | 143.8941147 | 5.899839113 | 69.13958953 | 8 | 0.055269503 |
| 2 | 5 | 4 | 146.5526295 | 6.426766132 | 20.34574581 | 8 | 0.017716776 |
| 3 | 7 | 3 | 149.9022357 | 7.22113526 | 143.0618367 | 8 | 0.139974159 |
| 4 | 6 | 2 | 153.352674 | 8.243557704 | 13160.71878 | 8 | 14.69984931 |
| 2 | 6 | 4 | 158.4497529 | 10.33740493 | 12959.46262 | 8 | 18.15169197 |
| 5 | 0 | 0 | 163.8602558 | 13.97186294 | 926.7431325 | 4 | 0.877207404 |
| 5 | 1 | 0 | 165.7630297 | 15.89525556 | 65.13741669 | 4 | 0.070143372 |
| 4 | 0 | 3 | 171.0484767 | 25.47363385 | 921.6363973 | 4 | 1.59051993 |
| 5 | 2 | 0 | 174.4949662 | 41.55175103 | 64.54997915 | 4 | 0.181707993 |
| 4 | 1 | 3 | 175.2190643 | 47.86751192 | 64.52484331 | 8 | 0.418491271 |