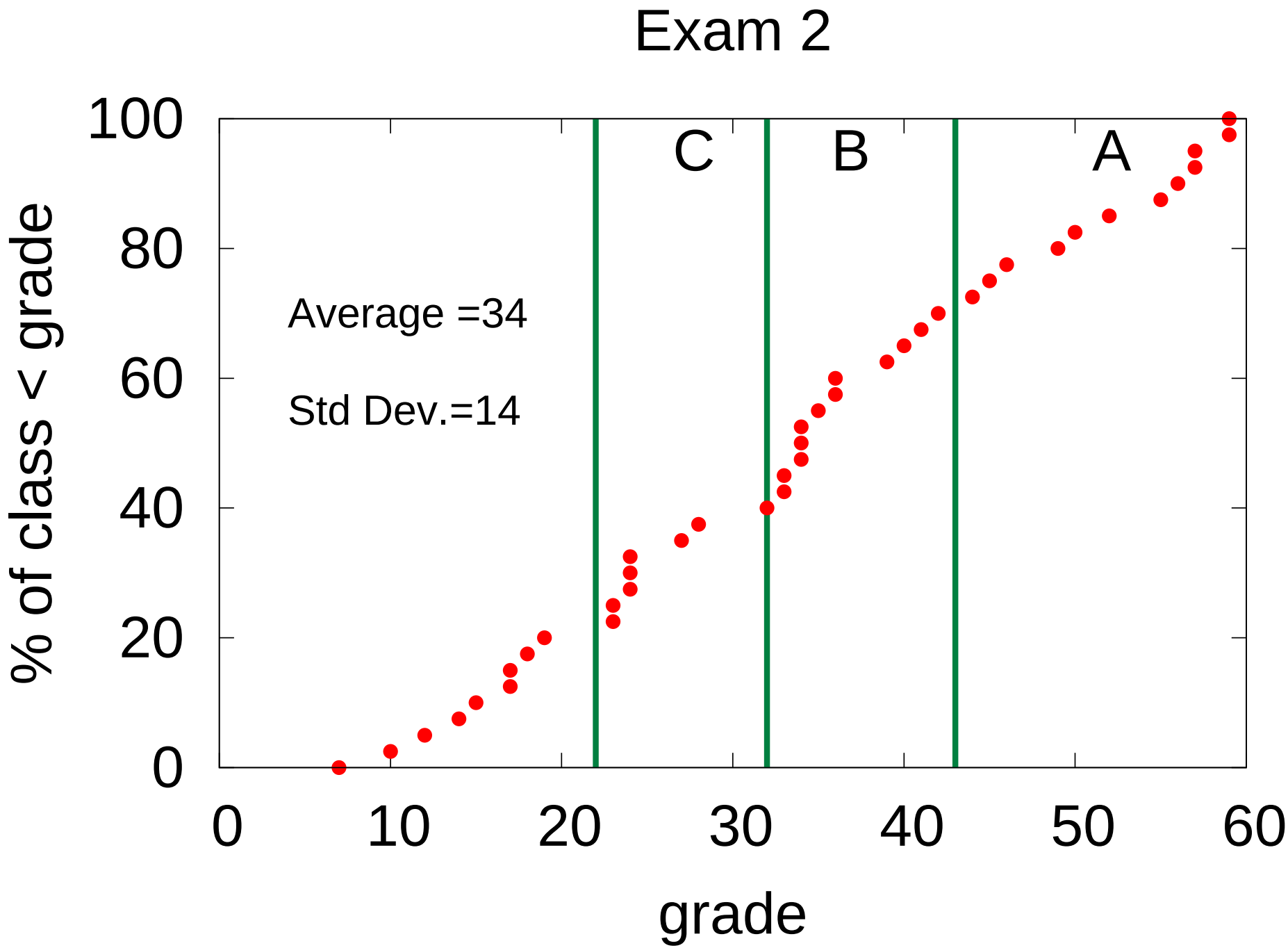
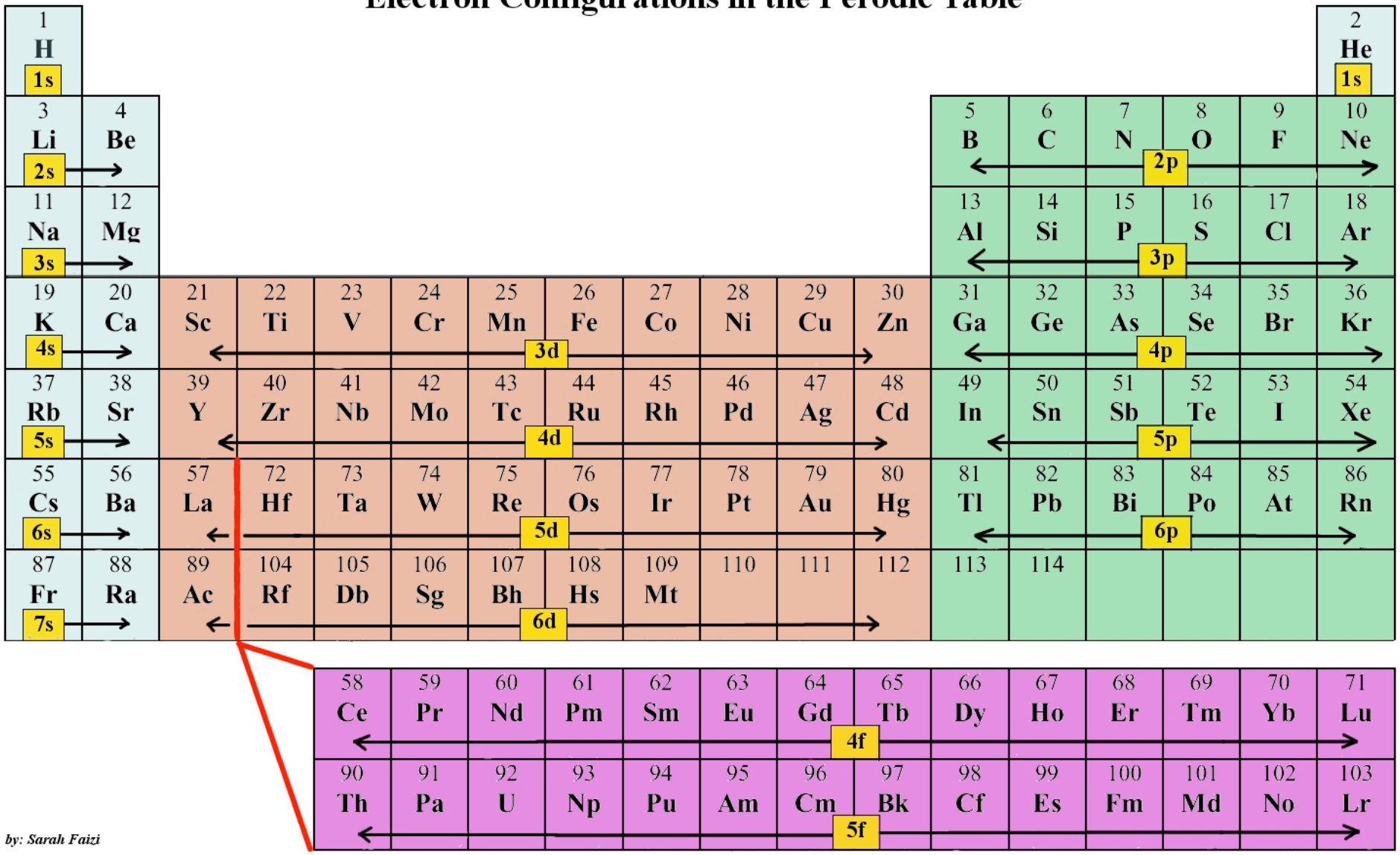

Exam 2
100
80
60
40
20
0
% of class < grade
Average =34
Std Dev.=14
C
B
A
0
10
20
30
40
50
60
grade

Electron Configurations in the Perodic Table



by: Sarah Faizi

Shell structure in the periodic table

Ionization Energy = Energy to rip off electron

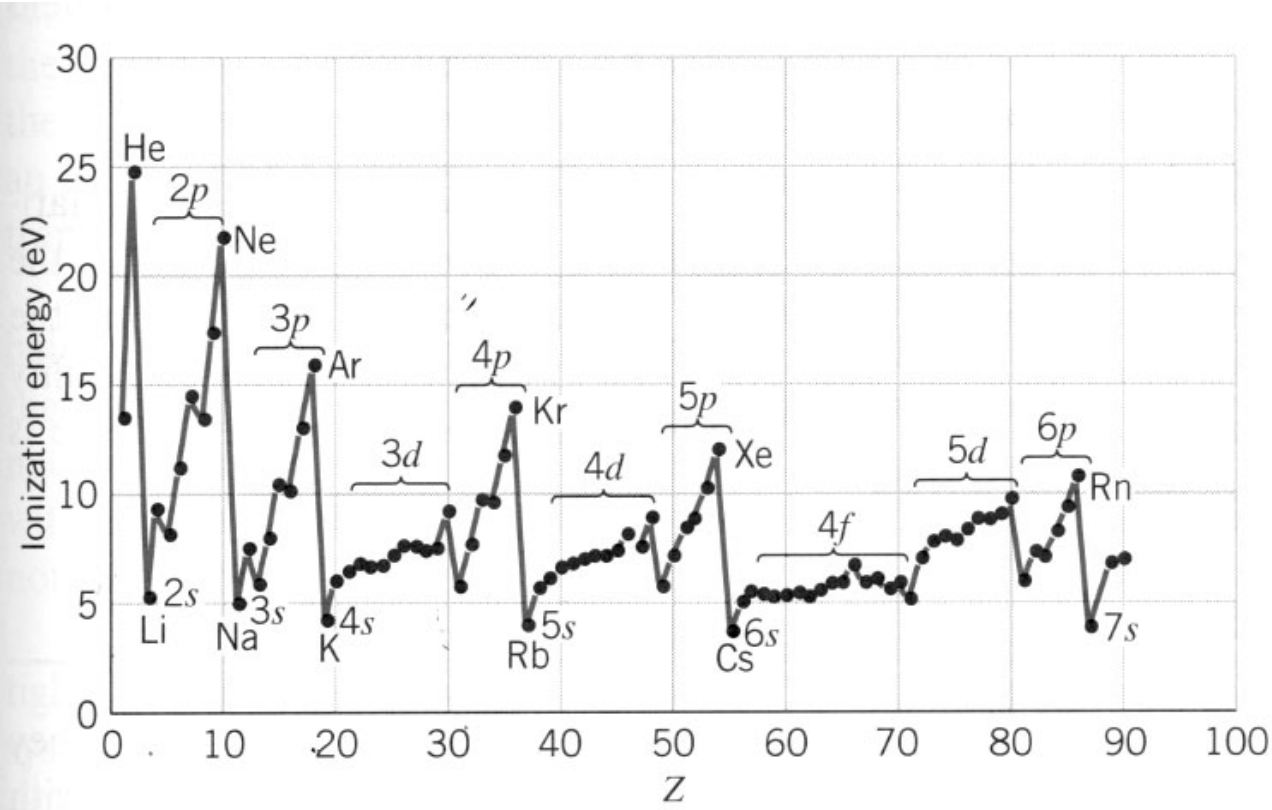
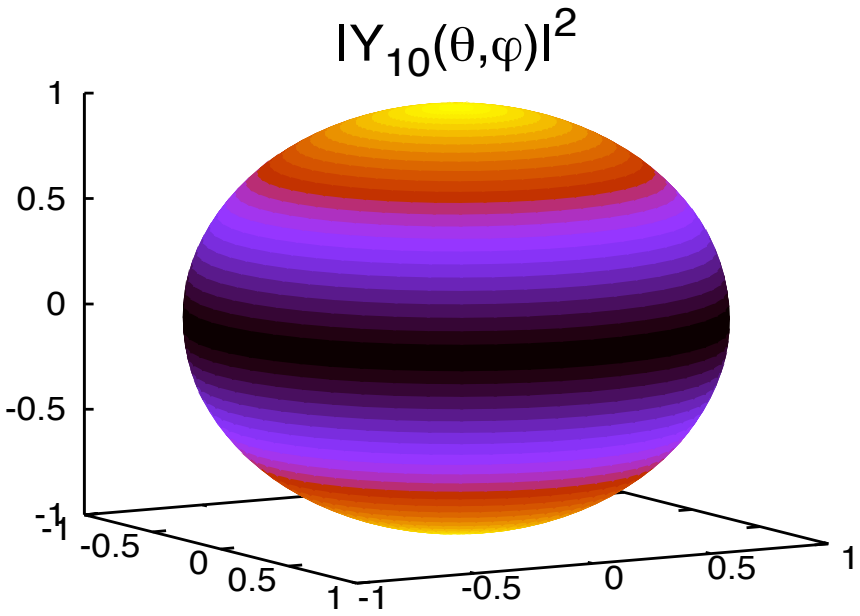
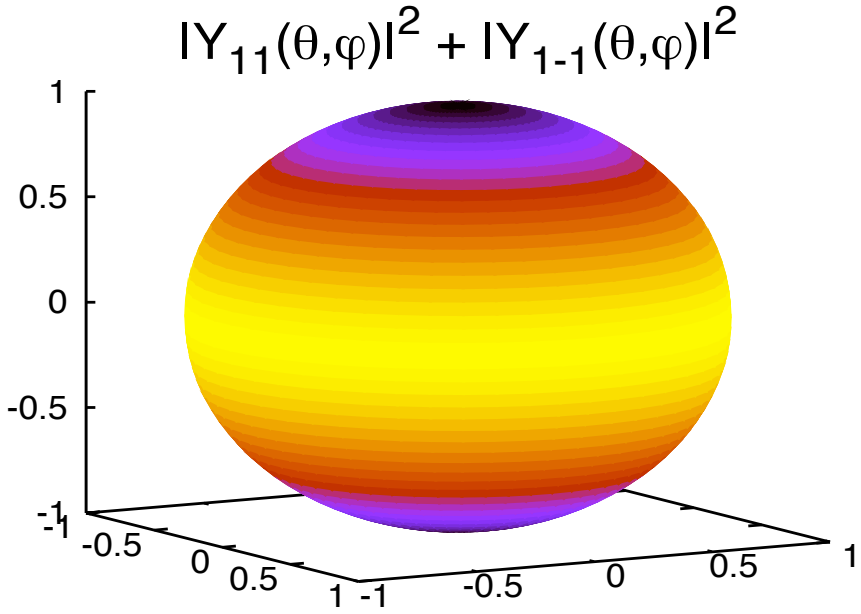


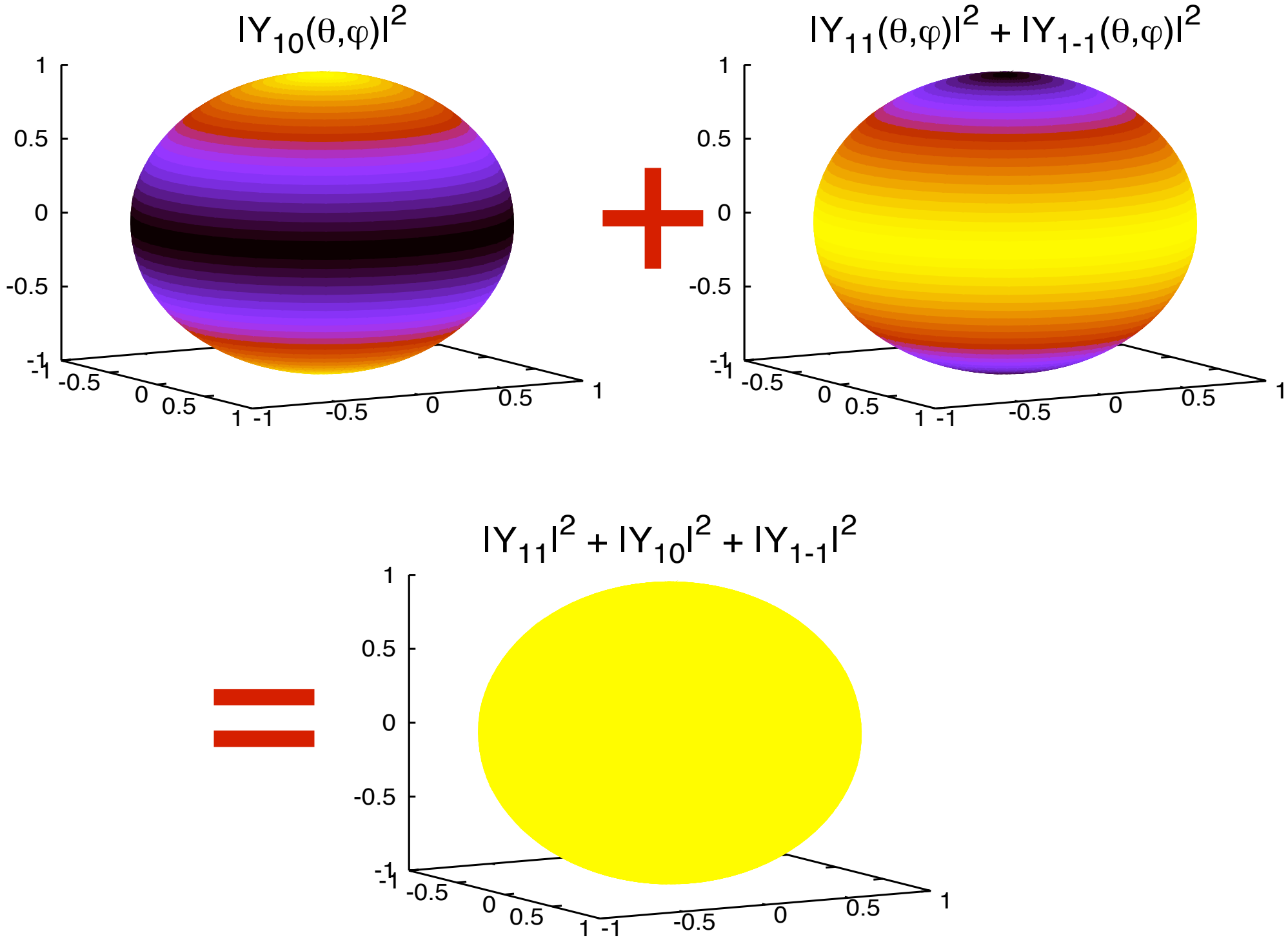
FIGURE 8.4 Ionization energies of neutral atoms of the elements.



m=0 has Two half bumps on sphere

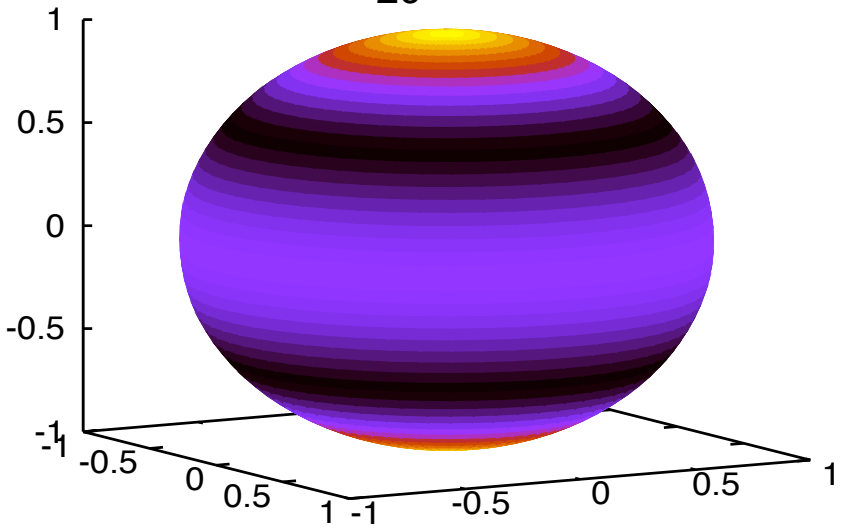


m=+/-1 has One half bump


$|Y_{10}(\theta,\varphi)|^2$
$|Y_{11}(\theta,\varphi)|^2 + |Y_{1-1}(\theta,\varphi)|^2$
$|Y_{11}|^2 + |Y_{10}|^2 + |Y_{1-1}|^2$
1
0.5
0
-0.5
-1
-1
-0.5
0
0.5
1

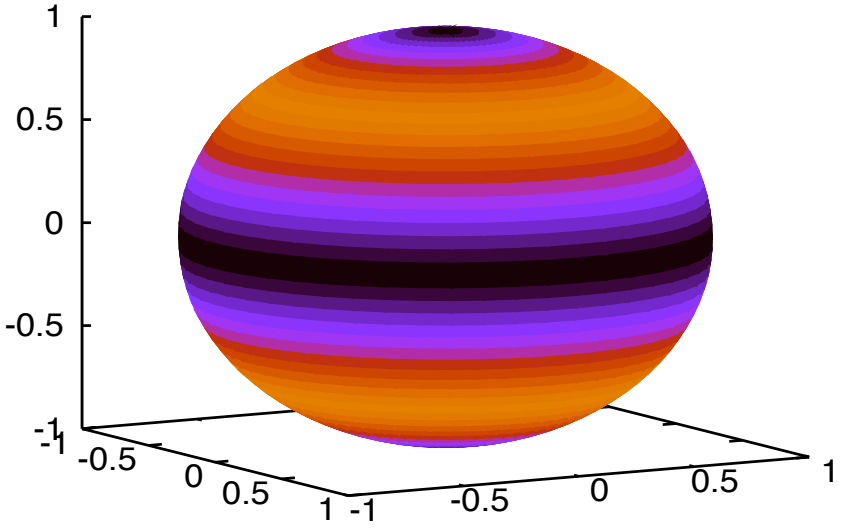
m = 0 has 3 bumps

$|Y_{20}(\theta,\varphi)|^2$



m=1 has two bumps

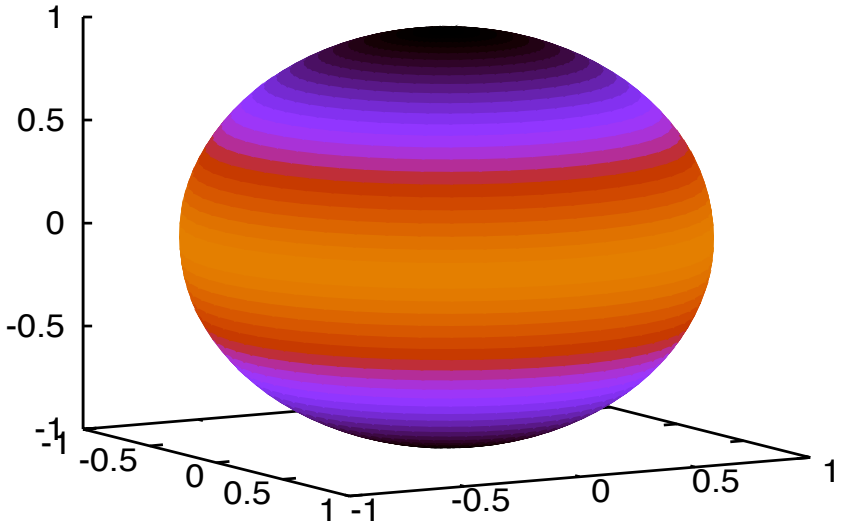
$|Y_{21}|^2 + |Y_{2-1}|^2$

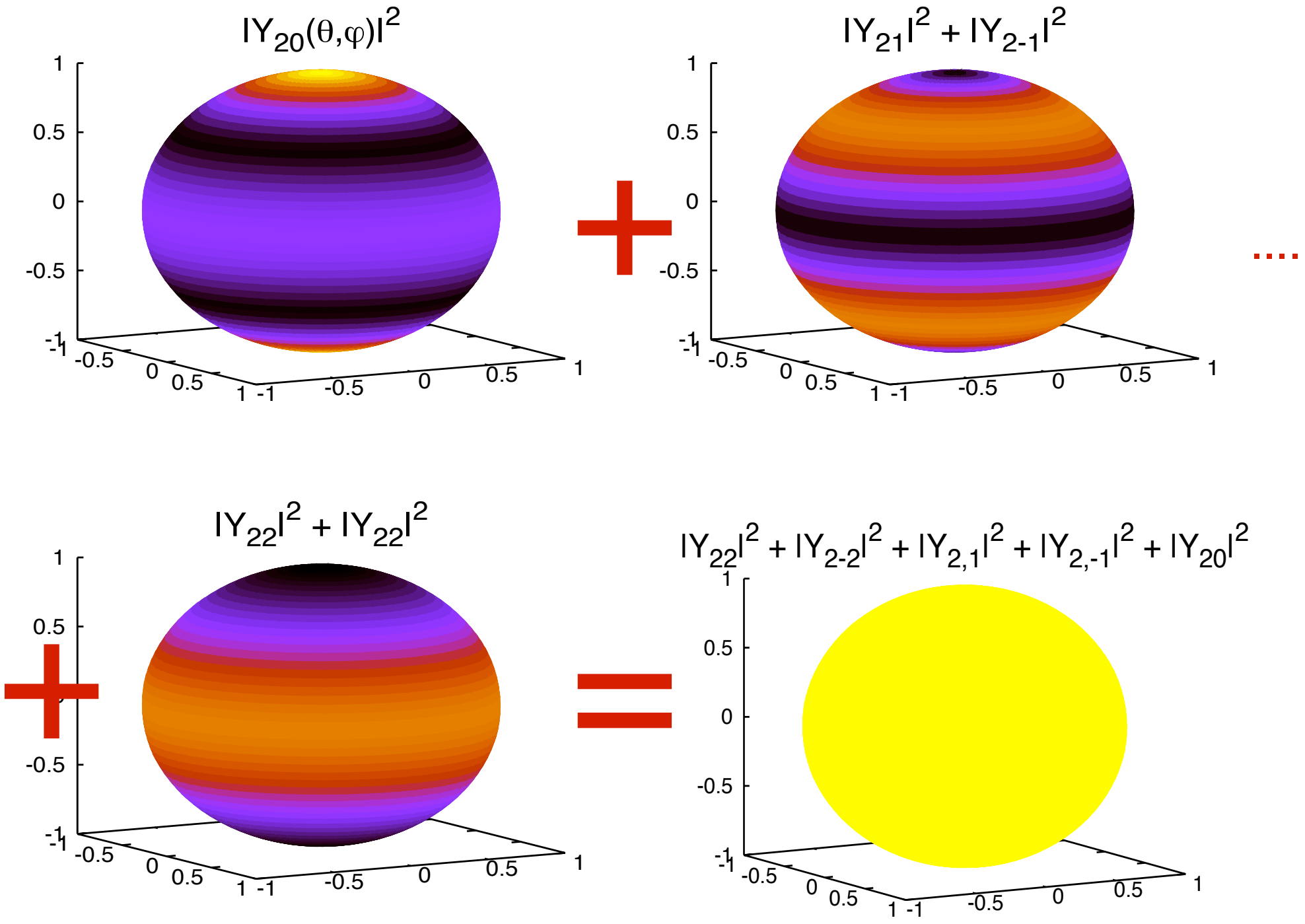


....

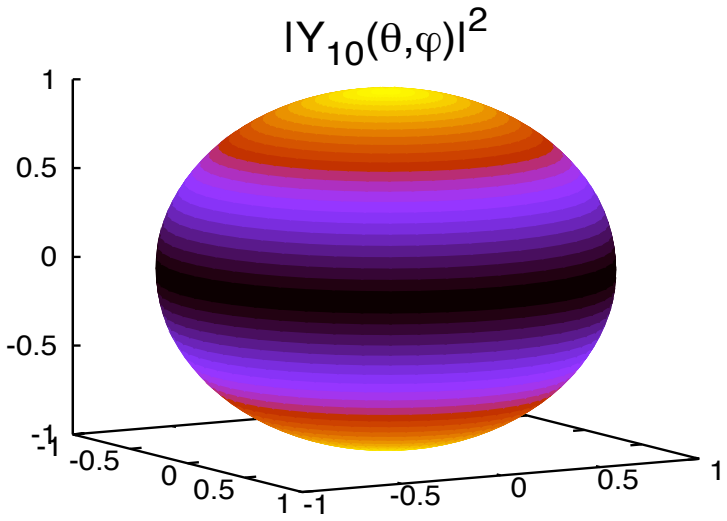
m=2 has one bumps

$|Y_{22}|^2 + |Y_{22}|^2$

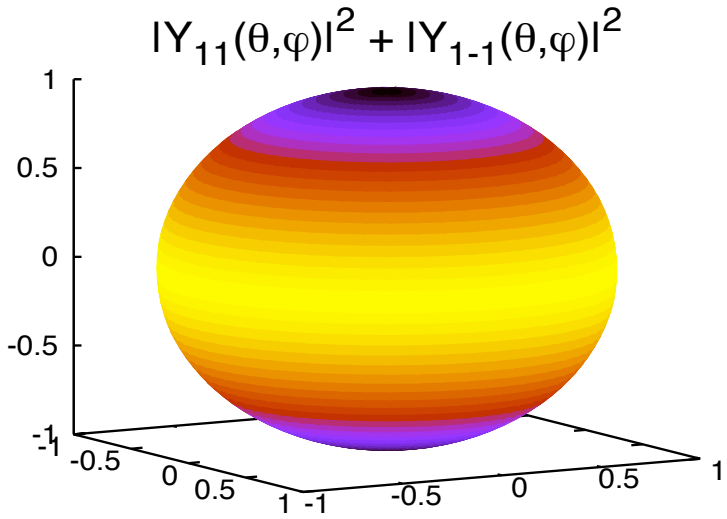



$|Y_{20}(\theta,\varphi)|^2$
$|Y_{21}|^2 + |Y_{2\text{-}1}|^2$
$|Y_{22}|^2 + |Y_{22}|^2$
$|Y_{22}|^2 + |Y_{2\text{-}2}|^2 + |Y_{2,1}|^2 + |Y_{2,\text{-}1}|^2 + |Y_{20}|^2$

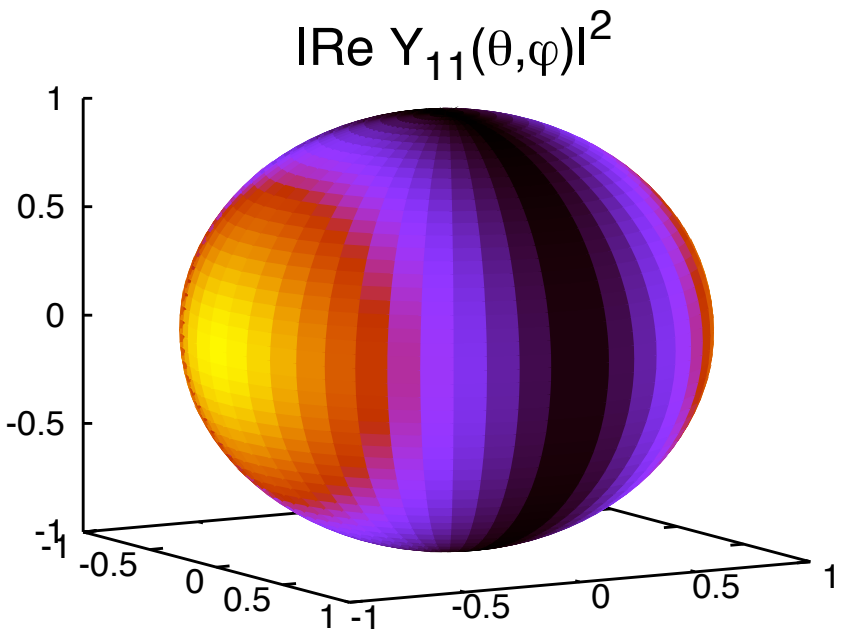
$L = 1$ Why does the $m = 1$ have one bump in θ while $m = 0$ has two?



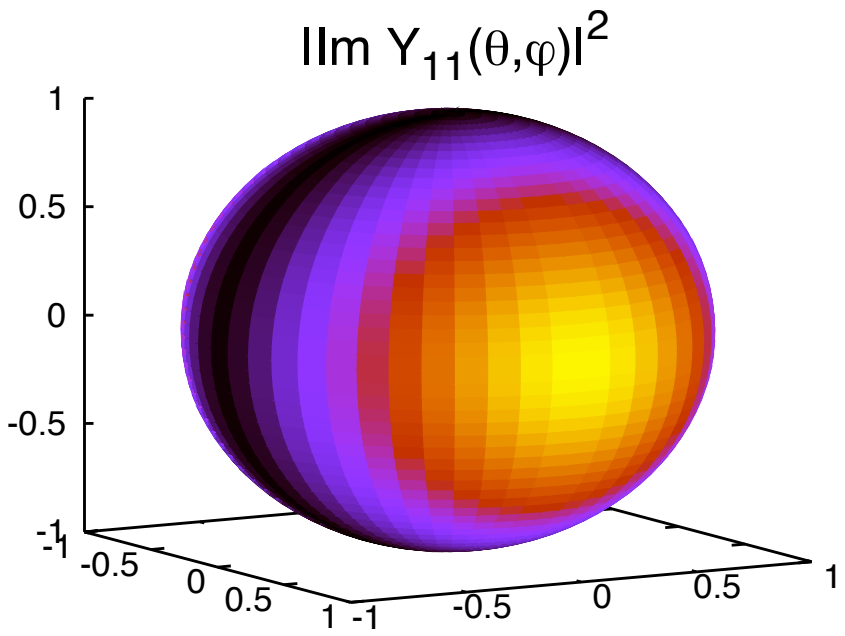
m=0 has Two half bumps on sphere



m=+/-1 has One half bump



+



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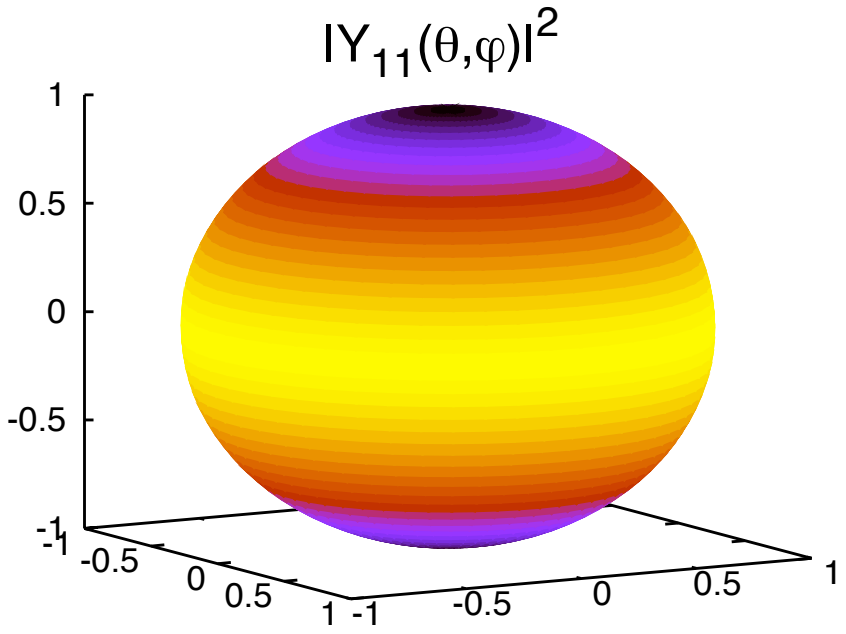
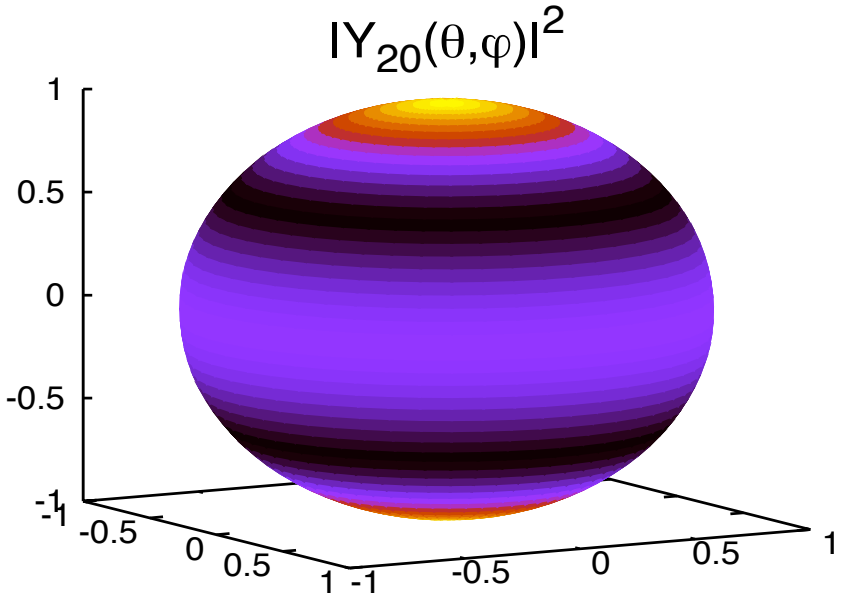


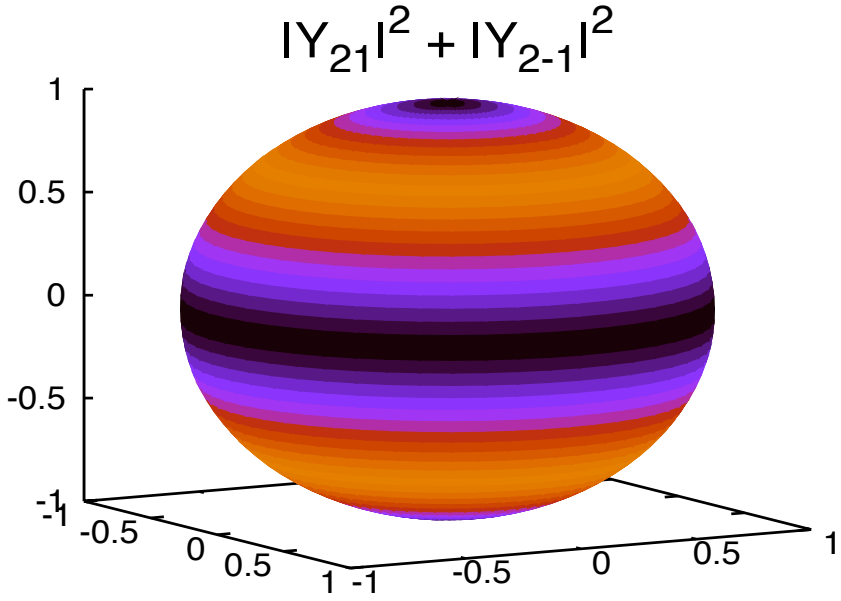
There is angular variation in phi direction

$L = 2$ Why does the $m = 2/1$ have one bump/two bumps in θ while $m = 0$ has three?

m = 0 has 3 bumps

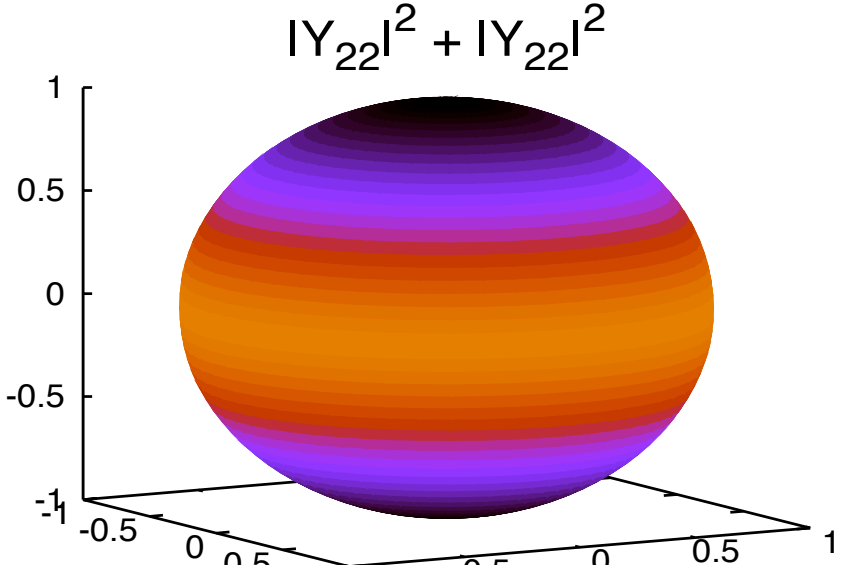


m=1 has two bumps

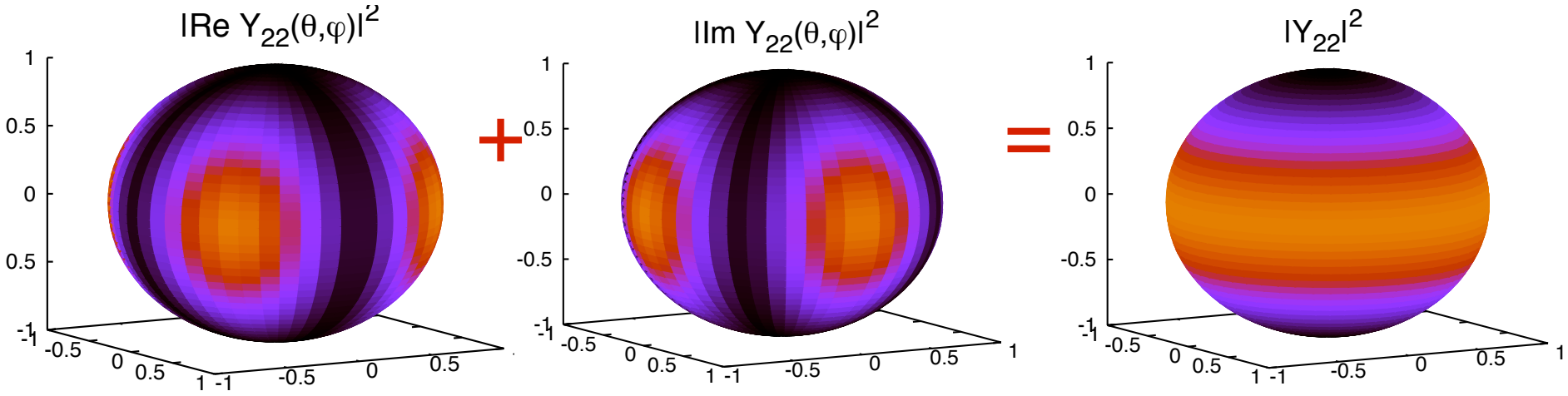


....

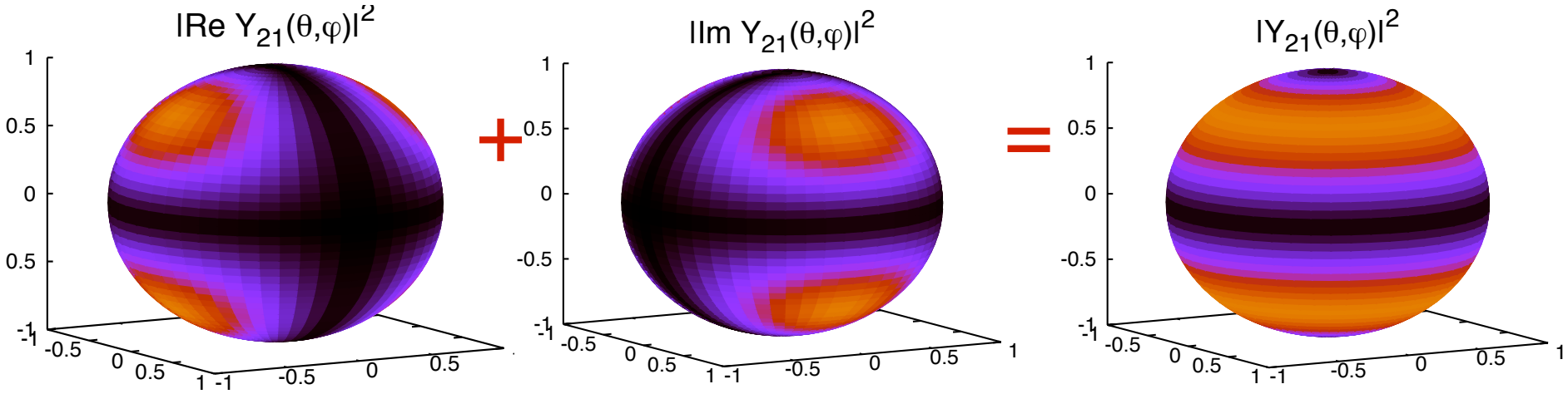
m=2 has one bumps



M=2



M=1



There is angular variation in phi direction