

水素原子の電子軌道 2017.2.8

gnuplot

```
gnuplot> unset border
gnuplot> unset tics
gnuplot> unset key
gnuplot> set parametric
gnuplot> set isosample 24,24
gnuplot> set ur [0:pi]
gnuplot> set vr [-pi:pi]
gnuplot> set xr [-1:1]
gnuplot> set yr [-1:1]
gnuplot> set zr [-1:1]
gnuplot> set arrow 1 from -1, 0, 0 to 1, 0, 0 lw 1
gnuplot> set arrow 2 from 0, -1, 0 to 0, 1, 0 lw 1
gnuplot> set arrow 3 from 0, 0, -1 to 0, 0, 1 lw 1
gnuplot> set size 0.55,1
gnuplot> x(u,v)=sin(u)*cos(v)
gnuplot> y(u,v)=sin(u)*sin(v)
gnuplot> z(u,v)=cos(u)
```

[s 軌道]

```
gnuplot> s=sqrt(1/(4*pi))
gnuplot> splot s*x(u,v),s*y(u,v),s*z(u,v)
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[p 軌道]

```
gnuplot> p=sqrt(3/(4*pi))
gnuplot> px(u,v)=sin(u)*cos(v)
gnuplot> py(u,v)=sin(u)*sin(v)
gnuplot> pz(u,v)=cos(u)
gnuplot> splot p*abs(px(u,v))*x(u,v),p*abs(px(u,v))*y(u,v),p*abs(px(u,v))*z(u,v)
gnuplot> splot p*abs(py(u,v))*x(u,v),p*abs(py(u,v))*y(u,v),p*abs(py(u,v))*z(u,v)
gnuplot> splot p*abs(pz(u,v))*x(u,v),p*abs(pz(u,v))*y(u,v),p*abs(pz(u,v))*z(u,v)
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[d 軌道]

```
gnuplot> d=sqrt(5/(16*pi))
gnuplot> d1=sqrt(15/(4*pi))
gnuplot> d3=sqrt(15/(16*pi))
gnuplot> dz(u,v)=(3*cos(u)**2-1)
gnuplot> dz1(u,v)=sin(u)*cos(u)*cos(v)
gnuplot> dz2(u,v)=sin(u)*cos(u)*sin(v)
gnuplot> dz3(u,v)=sin(u)*sin(u)*cos(2*v)
gnuplot> dz4(u,v)=sin(u)*sin(u)*sin(2*v)
gnuplot> splot d*dz(u,v)*x(u,v),d*dz(u,v)*y(u,v),d*dz(u,v)*z(u,v)
gnuplot> splot d1*dz1(u,v)*x(u,v),d1*dz1(u,v)*y(u,v),d1*dz1(u,v)*z(u,v)
gnuplot> splot d1*dz2(u,v)*x(u,v),d1*dz2(u,v)*y(u,v),d1*dz2(u,v)*z(u,v)
gnuplot> splot d3*dz3(u,v)*x(u,v),d3*dz3(u,v)*y(u,v),d3*dz3(u,v)*z(u,v)
gnuplot> splot d3*dz4(u,v)*x(u,v),d3*dz4(u,v)*y(u,v),d3*dz4(u,v)*z(u,v)
```