BASIS FUNCTIONS

Irreducible representations and their basis functions which transform like components of polar vectors (x, y, z), axial vectors (S_x, S_y, S_z) and second-rank tensors $(x^2, y^2, z^2, yz, xz, xy)$. An orthogonal coordinate system is used for *all* crystal classes. For hexagonal crystal classes, the x axis is chosen to be in the direction of the hexagonal a axis.

Class	Irreducible Representations and Basis Functions
1	$\Gamma_1(x;\ y;\ z;\ S_x;\ S_y;\ S_z;\ x^2;\ y^2;\ z^2;\ yz;\ xz;\ xy)$
$\bar{1}$	$\Gamma_1^+(S_x;\ S_y;\ S_z;\ x^2;\ y^2;\ z^2;\ yz;\ xz;\ xy),\ \Gamma_1^-(x;\ y;\ z)$
2	$\Gamma_1(y;\ S_y;\ x^2;\ y^2;\ z^2;\ xz),\ \Gamma_2(x;\ z;\ S_x;\ S_z;\ yz;\ xy)$
m	$\Gamma_1(x;\ z;\ S_y;\ x^2;\ y^2;\ z^2;\ xz;),\ \Gamma_2(y;\ S_x;\ S_z;\ yz;\ xy)$
$2/m$	$\Gamma_1^+(S_y;\ x^2;\ y^2;\ z^2;\ xz),\ \Gamma_2^+(S_x;\ S_z;\ yz;\ xy),\ \Gamma_1^-(y),\ \Gamma_2^-(x;\ z)$
222	$\Gamma_1(x^2;\ y^2;\ z^2),\ \Gamma_2(z;\ S_z;\ xy),\ \Gamma_3(x;\ S_x;\ yz),\ \Gamma_4(y;\ S_y;\ xz)$
$mm2$	$\Gamma_1(z;\ x^2;\ y^2;\ z^2),\ \Gamma_2(S_z;\ xy),\ \Gamma_3(y;\ S_x;\ yz),\ \Gamma_4(x;\ S_y;\ xz)$
$Amm2$	$\Gamma_1(z;\ x^2;\ y^2;\ z^2),\ \Gamma_2(S_z;\ xy),\ \Gamma_3(x;\ S_y;\ xz),\ \Gamma_4(y;\ S_x;\ yz)$
mmm	$\Gamma_1^+(x^2;\ y^2;\ z^2),\ \Gamma_2^+(S_z;\ xy),\ \Gamma_3^+(S_x;\ yz),\ \Gamma_4^+(S_y;\ xz),\ \Gamma_2^-(z),\ \Gamma_3^-(x),\ \Gamma_4^-(y)$
4	$\Gamma_1(z;\ S_z;\ x^2+y^2;\ z^2),\ \Gamma_2(x^2-y^2;\ xy),\ \Gamma_3\Gamma_4(y,x;\ S_y,S_x;\ yz,xz)$
$\bar{4}$	$\Gamma_1(S_z;\ x^2+y^2;\ z^2),\ \Gamma_2(z;\ x^2-y^2;\ xy),\ \Gamma_3\Gamma_4(x,y;\ S_y,S_x;\ yz,xz)$
$4/m$	$\Gamma_1^+(S_z;\ x^2+y^2;\ z^2),\ \Gamma_2^+(x^2-y^2;\ xy),\ \Gamma_3^+\Gamma_4^+(S_y,S_x;\ yz,xz),\ \Gamma_1^-(z),\ \Gamma_3^-\Gamma_4^-(y,x)$
422	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(x^2-y^2),\ \Gamma_3(z;\ S_z),\ \Gamma_4(xy),\ \Gamma_5(x,y;\ S_x,S_y;\ yz,-xz)$
$4mm$	$\Gamma_1(z;\ x^2+y^2;\ z^2),\ \Gamma_2(x^2-y^2),\ \Gamma_3(xy),\ \Gamma_4(S_z),\ \Gamma_5(x,y;\ S_y,-S_x;\ xz,yz)$
$\bar{4}2m$	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(x^2-y^2),\ \Gamma_3(z;\ xy),\ \Gamma_4(S_z),\ \Gamma_5(x,y;\ S_x,-S_y;\ yz,xz)$
$\bar{4}m2$	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(z;\ x^2-y^2),\ \Gamma_3(S_z),\ \Gamma_4(xy),\ \Gamma_5(x,y;\ S_y,S_x;\ xz,-yz)$
$4/mmm$	$\Gamma_1^+(x^2+y^2;\ z^2),\ \Gamma_2^+(x^2-y^2),\ \Gamma_3^+(S_z),\ \Gamma_4^+(xy),\ \Gamma_5^+(S_x,S_y;\ yz,-xz),\ \Gamma_3^-(z),\ \Gamma_5^-(x,y)$
3	$\Gamma_1(z;\ S_z;\ x^2+y^2;\ z^2),\ \Gamma_2\Gamma_3(y,x;\ S_y,S_x;\ x^2-y^2,2xy;\ yz,xz)$
$\bar{3}$	$\Gamma_1^+(S_z;\ x^2+y^2;\ z^2),\ \Gamma_2^+\Gamma_3^+(S_y,S_x;\ x^2-y^2,2xy;\ yz,xz),\ \Gamma_1^-(z),\ \Gamma_2^-\Gamma_3^-(y,x)$
312	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(z;\ S_z),\ \Gamma_3(y,-x;\ S_y,-S_x;\ x^2-y^2,-2xy;\ xz,yz)$
321	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(z;\ S_z),\ \Gamma_3(x,y;\ S_x,S_y;\ x^2-y^2,-2xy;\ yz,-xz)$
$3m1$	$\Gamma_1(z;\ x^2+y^2;\ z^2),\ \Gamma_2(S_z),\ \Gamma_3(y,-x;\ S_x,S_y;\ x^2-y^2,-2xy;\ yz,-xz)$
$31m$	$\Gamma_1(z;\ x^2+y^2;\ z^2),\ \Gamma_2(S_z),\ \Gamma_3(x,y;\ S_y,-S_x;\ x^2-y^2,-2xy;\ xz,yz)$
$\bar{3}1m$	$\Gamma_1^+(x^2+y^2;\ z^2),\ \Gamma_2^+(S_z),\ \Gamma_3^+(S_y,-S_x;\ x^2-y^2,-2xy;\ xz,yz),\ \Gamma_2^-(z),\ \Gamma_3^-(y,-x)$
$\bar{3}m1$	$\Gamma_1^+(x^2+y^2;\ z^2),\ \Gamma_2^+(S_z),\ \Gamma_3^+(S_x,S_y;\ x^2-y^2,-2xy;\ yz,-xz),\ \Gamma_2^-(z),\ \Gamma_3^-(y,-x)$
6	$\Gamma_1(z;\ S_z;\ x^2+y^2;\ z^2),\ \Gamma_3\Gamma_5(x^2-y^2,2xy),\ \Gamma_4\Gamma_6(y,x;\ S_y,S_x;\ yz,xz)$
$\bar{6}$	$\Gamma_1(S_z;\ x^2+y^2;\ z^2),\ \Gamma_2(z),\ \Gamma_3\Gamma_5(y,x;\ x^2-y^2,2xy),\ \Gamma_4\Gamma_6(S_y,S_x;\ yz,xz)$
$6/m$	$\Gamma_1^+(S_z;\ x^2+y^2;\ z^2),\ \Gamma_3^+\Gamma_5^+(x^2-y^2,2xy),\ \Gamma_4^+\Gamma_6^+(S_y,S_x;\ yz,xz),\ \Gamma_1^-(z),\ \Gamma_4^-\Gamma_6^-(y,x)$
622	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(z;\ S_z),\ \Gamma_5(x^2-y^2,-2xy),\ \Gamma_6(y,-x;\ S_y,-S_x;\ xz,yz)$
$6mm$	$\Gamma_1(z;\ x^2+y^2;\ z^2),\ \Gamma_2(S_z),\ \Gamma_5(x^2-y^2,-2xy),\ \Gamma_6(y,-x;\ S_x,S_y;\ yz,-xz)$
$\bar{6}m2$	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_2(S_z),\ \Gamma_3(z),\ \Gamma_5(y,-x;\ x^2-y^2,-2xy),\ \Gamma_6(S_y,-S_x;\ xz,yz)$
$\bar{6}2m$	$\Gamma_1(x^2+y^2;\ z^2),\ \Gamma_3(z),\ \Gamma_4(S_z),\ \Gamma_5(x,y;\ x^2-y^2,-2xy),\ \Gamma_6(S_y,-S_x;\ xz,yz)$
$6/mmm$	$\Gamma_1^+(x^2+y^2;\ z^2),\ \Gamma_2^+(S_z),\ \Gamma_5^+(x^2-y^2,-2xy),\ \Gamma_6^+(S_y,-S_x;\ xz,yz),\ \Gamma_2^-(z),\ \Gamma_6^-(y,-x)$
23	$\Gamma_1(x^2+y^2+z^2),\ \Gamma_2\Gamma_3(x^2+y^2-2z^2,\sqrt{3}x^2-\sqrt{3}y^2),\ \Gamma_4(x,y,z;\ S_x,S_y,S_z;\ yz,xz,xy)$
$m3$	$\Gamma_1^+(x^2+y^2+z^2),\ \Gamma_2^+\Gamma_3^+(x^2+y^2-2z^2,\sqrt{3}x^2-\sqrt{3}y^2),\ \Gamma_4^+(S_x,S_y,S_z;\ yz,xz,xy),\ \Gamma_4^-(x,y,z)$
432	$\Gamma_1(x^2+y^2+z^2),\ \Gamma_3(x^2+y^2-2z^2,\sqrt{3}x^2-\sqrt{3}y^2),\ \Gamma_4(x,y,z;\ S_x,S_y,S_z),\ \Gamma_5(xy,yz,xz)$
$\bar{4}3m$	$\Gamma_1(x^2+y^2+z^2),\ \Gamma_3(x^2+y^2-2z^2,\sqrt{3}x^2-\sqrt{3}y^2),\ \Gamma_4(x,y,z;\ yz,xz,xy),\ \Gamma_5(S_x,S_y,S_z)$
$m\bar{3}m$	$\Gamma_1^+(x^2+y^2+z^2),\ \Gamma_3^+(x^2+y^2-2z^2,\sqrt{3}x^2-\sqrt{3}y^2),\ \Gamma_4^+(S_x,S_y,S_z),\ \Gamma_5^+(xy,yz,xz),\ \Gamma_4^-(x,y,z)$