```
elsif(($l1 == 0 and $m1 ==  0 and $l2 == 2 and $m2 == -2) or
      ($l1 == 2 and $m1 == -2 and $l2 == 0 and $m2 == 0)) { #sxy
    $b = sqrt(3.0)*$lx*$ly * $VS;
}
elsif(($l1 == 0 and $m1 ==  0 and $l2 == 2 and $m2 == -1) or
      ($l1 == 2 and $m1 == -1 and $l2 == 0 and $m2 == 0)) { #syz
    $b = sqrt(3.0)*$ly*$lz * $VS;
}
elsif(($l1 == 0 and $m1 ==  0 and $l2 == 2 and $m2 ==  0) or
      ($l1 == 2 and $m1 ==  0 and $l2 == 0 and $m2 == 0)) { #s3z2-r2
    $b = ($lz2 - 0.5*($lx2 + $ly2)) * $VS;
}
elsif(($l1 == 0 and $m1 ==  0 and $l2 == 2 and $m2 ==  1) or
      ($l1 == 2 and $m1 ==  1 and $l2 == 0 and $m2 == 0)) { #szx
    $b = sqrt(3.0)*$lz*$lx * $VS;
}
elsif(($l1 == 0 and $m1 ==  0 and $l2 == 2 and $m2 ==  2) or
      ($l1 == 2 and $m1 ==  2 and $l2 == 0 and $m2 == 0)) { #sx2-y2
    $b = 0.5 * sqrt(3.0) * ($lx2 - $ly2) * $VS;
}
elsif(($l1 == 1 and $m1 == -1 and $l2 == 2 and $m2 == -2)) { #y xy
    $b =  $lx*$ly*$lz*(sqrt(3.0) * $VS - 2.0*$VP);
}
elsif(($l1 == 2 and $m1 == -2 and $l2 == 1 and $m2 == -1)) { #xy y
    $b =  $lx*$ly*$lz*(sqrt(3.0) * $VS - 2.0*$VP);
    $b = -$b;
}
elsif(($l1 == 1 and $m1 == -1 and $l2 == 2 and $m2 == -1)) { #y yz
    $b =  sqrt(3.0) * $ly2*$lz * $VS + $lz*(1.0-2.0*$ly2) * $VP;
}
elsif(($l1 == 2 and $m1 == -1 and $l2 == 1 and $m2 == -1)) { #yz y
    $b =  sqrt(3.0) * $ly2*$lz * $VS + $lz*(1.0-2.0*$ly2) * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 == -1 and $l2 == 2 and $m2 ==  0)) { #y 3z2-r2
    $b =  $ly*($lz2-0.5*($lx2+$ly2)) * $VS - sqrt(3.0) * $ly*($lx2+$y2) * $
    VP;
}
elsif(($l1 == 2 and $m1 ==  0 and $l2 == 1 and $m2 == -1)) { #3z2-r2 y
    $b =  $ly*($lz2-0.5*($lx2+$ly2)) * $VS - sqrt(3.0) * $ly*($lx2+$y2) * $
    VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 == -1 and $l2 == 2 and $m2 ==  1)) { #y zx
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0 * $VP);
}
elsif(($l1 == 2 and $m1 ==  1 and $l2 == 1 and $m2 == -1)) { #zx y
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0 * $VP);
    $b = -$b;
}
elsif(($l1 == 1 and $m1 == -1 and $l2 == 2 and $m2 ==  2)) { #y x2-y2
```

```
    $b =  0.5*sqrt(3.0) * $ly*($lx2-$ly2) * $VS - $ly*(1.0+$lx2-$ly2) * $V
    P;
}
elsif(($l1 == 2 and $m1 ==  2 and $l2 == 1 and $m2 == -1)) { #x2-y2 y
    $b =  0.5*sqrt(3.0) * $ly*($lx2-$ly2) * $VS - $ly*(1.0+$lx2-$ly2) * $V
    P;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  0 and $l2 == 2 and $m2 == -2)) { #z xy
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0 * $VP);
}
elsif(($l1 == 2 and $m1 == -2 and $l2 == 1 and $m2 ==  0)) { #xy z
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0 * $VP);
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  0 and $l2 == 2 and $m2 == -1)) { #z yz
    $b =  sqrt(3.0) * $lz2*$ly * $VS + $ly*(1.0-2.0*$lz2) * $VP;
}
elsif(($l1 == 2 and $m1 == -1 and $l2 == 1 and $m2 ==  0)) { #yz z
    $b = sqrt(3.0) * $lz2*$ly * $VS + $ly*(1.0-2.0*$lz2) * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  0 and $l2 == 2 and $m2 ==  0)) { #z 3z2-r2
    $b =  $lz*($lz2-0.5*($lx2+$ly2)) * $VS + sqrt(3.0)*$lz*($lx2+$ly2) * $V
    P;
}
elsif(($l1 == 2 and $m1 ==  0 and $l2 == 1 and $m2 ==  0)) { #3z2-r2 z
    $b =  $lz*($lz2-0.5*($lx2+$ly2)) * $VS + sqrt(3.0)*$lz*($lx2+$ly2) * $V
    P;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  0 and $l2 == 2 and $m2 ==  1)) { #z zx
    $b =  sqrt(3.0)*$lz2*$lx * $VS + $lx*(1.0-2.0*$lz) * $VP;
}
elsif(($l1 == 2 and $m1 ==  0 and $l2 == 1 and $m2 ==  0)) { #zx z
    $b =  sqrt(3.0)*$lz2*$lx * $VS + $lx*(1.0-2.0*$lz) * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  0 and $l2 == 2 and $m2 ==  2)) { #z x2-y2
    $b =  0.5*sqrt(3.0)*$lz*($lx2-$ly2) * $VS - $lz*($lx2-$ly2) * $VP;
}
elsif(($l1 == 2 and $m1 ==  2 and $l2 == 1 and $m2 ==  0)) { #x2-y2 z
    $b =  0.5*sqrt(3.0)*$lz*($lx2-$ly2) * $VS - $lz*($lx2-$ly2) * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  1 and $l2 == 2 and $m2 == -2)) { #x xy
    $b =  sqrt(3.0) * $lx2*$ly * $VS + $ly*(1.0-2.0*$lx2) * $VP;
}
elsif(($l1 == 2 and $m1 == -2 and $l2 == 1 and $m2 ==  1)) { #xy x
    $b =  sqrt(3.0) * $lx2*$ly * $VS + $ly*(1.0-2.0*$lx2) * $VP;
    $b = -$b;
```

```
}
elsif(($l1 == 1 and $m1 ==  1 and $l2 == 2 and $m2 == -1)) { #x yz
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0*$VP);
}
elsif(($l1 == 2 and $m1 == -1 and $l2 == 1 and $m2 ==  1)) { #yz x
    $b =  $lx*$ly*$lz * (sqrt(3.0) * $VS - 2.0*$VP);
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  1 and $l2 == 2 and $m2 ==  0)) { #x 3z2-r2
    $b =  $lx*($lz2-0.5*($lx2+$ly2)) * $VS - sqrt(3.0) * $lx*$lz2 * $VP;
}
elsif(($l1 == 2 and $m1 ==  0 and $l2 == 1 and $m2 ==  1)) { #3z2-r2 x
    $b =  $lx*($lz2-0.5*($lx2+$ly2)) * $VS - sqrt(3.0) * $lx*$lz2 * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  1 and $l2 == 2 and $m2 ==  1)) { #x zx
    $b =  sqrt(3.0)*$lx2*$lz * $VS + $lz*(1.0-2.0*$lx2) * $VP;
}
elsif(($l1 == 2 and $m1 ==  1 and $l2 == 1 and $m2 ==  1)) { #zx x
    $b =  sqrt(3.0)*$lx2*$lz * $VS + $lz*(1.0-2.0*$lx2) * $VP;
    $b = -$b;
}
elsif(($l1 == 1 and $m1 ==  1 and $l2 == 2 and $m2 ==  2)) { #x x2-y2
    $b =  0.5*sqrt(3.0)*$lx*($lx2-$ly2) * $VS + $lx*(1.0-$lx2+$ly2) * $VP;
}
elsif(($l1 == 2 and $m1 == -2 and $l2 == 1 and $m2 ==  1)) { #x x2-y2
    $b =  0.5*sqrt(3.0)*$lx*($lx2-$ly2) * $VS + $lx*(1.0-$lx2+$ly2) * $VP;
    $b = -$b;
}
```

$$E_{s,\,x^2-y^2} = \tfrac{1}{2}3^{1/2}(l^2-m^2)V_{sd\sigma}$$

$$E_{s,\,3z^2-r^2} = [n^2-\tfrac{1}{2}(l^2+m^2)]V_{sd\sigma}$$

$$E_{x,\,xy} = 3^{1/2}l^2mV_{pd\sigma}+m(1-2l^2)V_{pd\pi}$$

$$E_{x,\,yz} = 3^{1/2}lmnV_{pd\sigma}-2lmnV_{pd\pi}$$

$$E_{x,\,zx} = 3^{1/2}l^2nV_{pd\sigma}+n(1-2l^2)V_{pd\pi}$$

$$E_{x,\,x^2-y^2} = \tfrac{1}{2}3^{1/2}l(l^2-m^2)V_{pd\sigma}+l(1-l^2+m^2)V_{pd\pi}$$

$$E_{y,\,x^2-y^2} = \tfrac{1}{2}3^{1/2}m(l^2-m^2)V_{pd\sigma}-m(1+l^2-m^2)V_{pd\pi}$$

$$E_{z,\,x^2-y^2} = \tfrac{1}{2}3^{1/2}n(l^2-m^2)V_{pd\sigma}-n(l^2-m^2)V_{pd\pi}$$

$$E_{x,\,3z^2-r^2} = l[n^2-\tfrac{1}{2}(l^2+m^2)]V_{pd\sigma}-3^{1/2}ln^2V_{pd\pi}$$

$$E_{y,\,3z^2-r^2} = m[n^2-\tfrac{1}{2}(l^2+m^2)]V_{pd\sigma}-3^{1/2}mn^2V_{pd\pi}$$

$$E_{z,\,3z^2-r^2} = n[n^2-\tfrac{1}{2}(l^2+m^2)]V_{pd\sigma}+3^{1/2}n(l^2+m^2)V_{pd\pi}$$

$$E_{xy,\,xy} = 3l^2m^2V_{dd\sigma}+(l^2+m^2-4l^2m^2)V_{dd\pi}+(n^2+l^2m^2)V_{dd\delta}$$

$$E_{xy,\,yz} = 3lm^2nV_{dd\sigma}+ln(1-4m^2)V_{dd\pi}+ln(m^2-1)V_{dd\delta}$$

$$E_{xy,\,zx} = 3l^2mnV_{dd\sigma}+mn(1-4l^2)V_{dd\pi}+mn(l^2-1)V_{dd\delta}$$

$$E_{xy,\,x^2-y^2} = \tfrac{3}{2}lm(l^2-m^2)V_{dd\sigma}+2lm(m^2-l^2)V_{dd\pi}+\tfrac{1}{2}lm(l^2-m^2)V_{dd\delta}$$

$$E_{y,\,3z^2-r^2} = m[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{pd\sigma} - 3^{1/2}mn^2V_{pd\pi}$$

$$E_{z,\,3z^2-r^2} = n[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{pd\sigma} + 3^{1/2}n(l^2+m^2)V_{pd\pi}$$

$$E_{xy,\,xy} = 3l^2m^2V_{dd\sigma} + (l^2+m^2-4l^2m^2)V_{dd\pi} + (n^2+l^2m^2)V_{dd\delta}$$

$$E_{xy,\,yz} = 3lm^2nV_{dd\sigma} + ln(1-4m^2)V_{dd\pi} + ln(m^2-1)V_{dd\delta}$$

$$E_{xy,\,zx} = 3l^2mnV_{dd\sigma} + mn(1-4l^2)V_{dd\pi} + mn(l^2-1)V_{dd\delta}$$

$$E_{xy,\,x^2-y^2} = \tfrac{3}{2}lm(l^2-m^2)V_{dd\sigma} + 2lm(m^2-l^2)V_{dd\pi} + \tfrac{1}{2}lm(l^2-m^2)V_{dd\delta}$$

$$E_{yz,\,x^2-y^2} = \tfrac{3}{2}mn(l^2-m^2)V_{dd\sigma} - mn[1+2(l^2-m^2)]V_{dd\pi} + mn[1+\tfrac{1}{2}(l^2-m^2)]V_{dd\delta}$$

$$E_{zx,\,x^2-y^2} = \tfrac{3}{2}nl(l^2-m^2)V_{dd\sigma} + nl[1-2(l^2-m^2)]V_{dd\pi} - nl[1-\tfrac{1}{2}(l^2-m^2)]V_{dd\delta}$$

$$E_{xy,\,3z^2-r^2} = 3^{1/2}lm[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{dd\sigma} - 3^{1/2}2lmn^2V_{dd\pi} + \tfrac{1}{2}\,3^{1/2}lm(1+n^2)V_{dd\delta}$$

$$E_{yz,\,3z^2-r^2} = 3^{1/2}mn[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{dd\sigma} + 3^{1/2}mn(l^2+m^2-n^2)V_{dd\pi} - \tfrac{1}{2}\,3^{1/2}mn(l^2+m^2)V_{dd\delta}$$

$$E_{zx,\,3z^2-r^2} = 3^{1/2}ln[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{dd\sigma} + 3^{1/2}ln(l^2+m^2-n^2)V_{dd\pi} - \tfrac{1}{2}\,3^{1/2}ln(l^2+m^2)V_{dd\delta}$$

$$E_{x^2-y^2,\,x^2-y^2} = \tfrac{3}{4}(l^2-m^2)^2V_{dd\sigma} + [l^2+m^2-(l^2-m^2)^2]V_{dd\pi} + [n^2+\tfrac{1}{4}(l^2-m^2)^2]V_{dd\delta}$$

$$E_{x^2-y^2,\,3z^2-r^2} = \tfrac{1}{2}\,3^{1/2}(l^2-m^2)[n^2 - \tfrac{1}{2}(l^2+m^2)]V_{dd\sigma} + 3^{1/2}n^2(m^2-l^2)V_{dd\pi} + \tfrac{1}{4}\,3^{1/2}(1+n^2)(l^2-m^2)V_{dd\delta}$$

$$E_{3z^2-r^2,\,3z^2-r^2} = [n^2 - \tfrac{1}{2}(l^2+m^2)]^2V_{dd\sigma} + 3n^2(l^2+m^2)V_{dd\pi} + \tfrac{3}{4}(l^2+m^2)^2V_{dd\delta}$$