two laser beams interacting with three-level atom.

In[55]:=
```
EL1[E01_, k1_, w01_, θ_, x_, y_, z_] :=
```

$$\frac{E01}{\sqrt{1+\left(\frac{x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta]}{\frac{w01^2\,k1}{2}}\right)^2}}\,\mathrm{Exp}\left[-\frac{(y\,\mathrm{Cos}[\theta]+x\,\mathrm{Sin}[\theta])^2+z^2}{\left(w01\sqrt{1+\left(\frac{x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta]}{\frac{w01^2\,k1}{2}}\right)^2}\right)^2}\right]\mathrm{Exp}[I\,k1\,(x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta])]$$

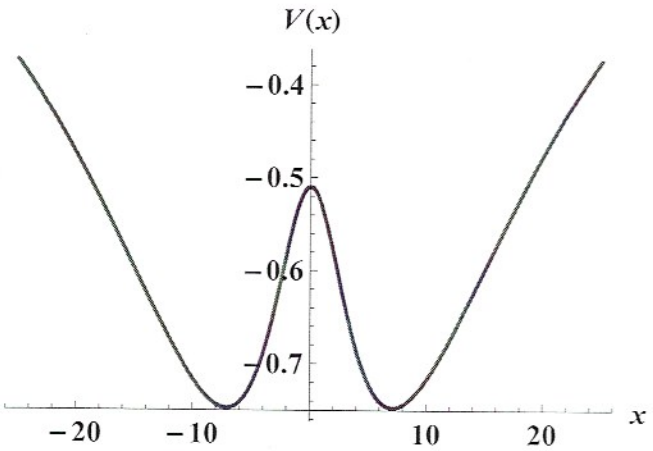
```
EL2[E02_, k2_, w02_, θ_, x_, y_, z_] :=
```

$$\frac{E02}{\sqrt{1+\left(\frac{x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta]}{\frac{w02^2\,k2}{2}}\right)^2}}\,\mathrm{Exp}\left[-\frac{(y\,\mathrm{Cos}[\theta]+x\,\mathrm{Sin}[\theta])^2+z^2}{\left(w02\sqrt{1+\left(\frac{x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta]}{\frac{w02^2\,k2}{2}}\right)^2}\right)^2}\right]\mathrm{Exp}[I\,k2\,(x\,\mathrm{Cos}[\theta]-y\,\mathrm{Sin}[\theta])]$$

```
E1 := EL1[0.7, 1, 3, Pi/360, x0, 0, 0]
E2 := EL2[1, 2.5, 4, -Pi/360, x0, 0, 0]
Etot := Abs[(E1)]^2 - Abs[(E2)]^2
```

In[60]:=
```
Plot[Etot, {x0, -25, 25}, BaseStyle -> {FontSize → 14}, PlotStyle → {Thick},
 AxesLabel → {x, V[x]}, LabelStyle → Directive[Bold], PlotRange → All]
```

Out[60]=

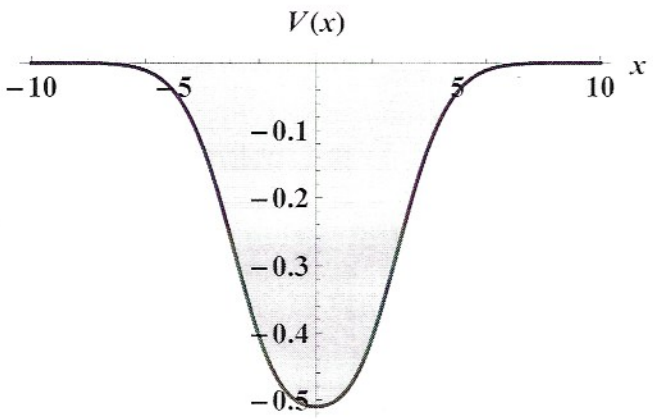


$$EL1[E01\_, k1\_, w01\_, x\_, y\_, z\_] := \frac{E01}{\sqrt{1+\left(\frac{x}{\frac{w01^2\,k1}{2}}\right)^2}}\,\mathrm{Exp}\left[-\frac{y^2+z^2}{\left(w01\sqrt{1+\left(\frac{x}{\frac{w01^2\,k1}{2}}\right)^2}\right)^2}\right]\mathrm{Exp}[I\,k1\,x]$$

$$EL2[E02\_, k2\_, w02\_, x\_, y\_, z\_] := \frac{E02}{\sqrt{1+\left(\frac{x}{\frac{w02^2\,k2}{2}}\right)^2}}\,\mathrm{Exp}\left[-\frac{y^2+z^2}{\left(w02\sqrt{1+\left(\frac{x}{\frac{w02^2\,k2}{2}}\right)^2}\right)^2}\right]\mathrm{Exp}[I\,k2\,x]$$

```
E1 := EL1[0.7, 1, 3, 0, y0, 0]
E2 := EL2[1, 2.5, 4, 0, y0, 0]
Etot := Abs[(E1)]^2 - Abs[(E2)]^2
```

```
Plot[Etot, {y0, -10, 10}, BaseStyle -> {FontSize → 14}, Filling → Axis, PlotStyle → {Thick},
 AxesLabel → {x, V[x]}, LabelStyle → Directive[Bold], PlotRange → All]
```

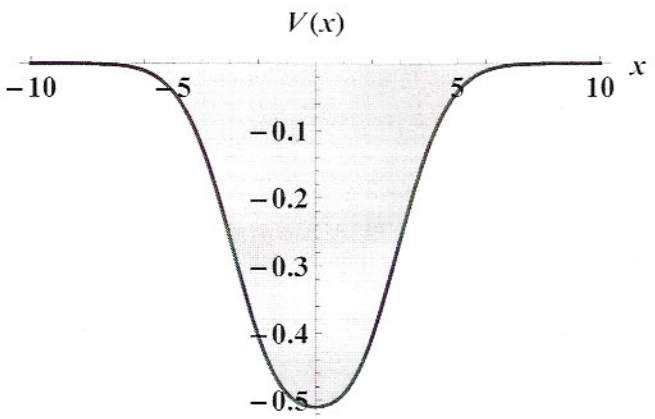


$$\text{EL1[E01\_, k1\_, w01\_, x\_, y\_, z\_] := } \frac{\text{E01}}{\sqrt{1+\left(\frac{x}{\frac{w01^2\,k1}{2}}\right)^2}}\,\text{Exp}\left[-\frac{y^2+z^2}{\left(w01\sqrt{1+\left(\frac{x}{\frac{w01^2\,k1}{2}}\right)^2}\right)^2}\right]\text{Exp[I k1 x]}$$

$$\text{EL2[E02\_, k2\_, w02\_, x\_, y\_, z\_] := } \frac{\text{E02}}{\sqrt{1+\left(\frac{x}{\frac{w02^2\,k2}{2}}\right)^2}}\,\text{Exp}\left[-\frac{y^2+z^2}{\left(w02\sqrt{1+\left(\frac{x}{\frac{w02^2\,k2}{2}}\right)^2}\right)^2}\right]\text{Exp[I k2 x]}$$

```
E1 := EL1[0.7, 1, 3, 0, 0, z0]
E2 := EL2[1, 2.5, 4, 0, 0, z0]
Etot := Abs[(E1)]^2 - Abs[(E2)]^2
```

```
Plot[Etot, {z0, -10, 10}, BaseStyle -> {FontSize → 14}, Filling → Axis, PlotStyle → {Thick},
 AxesLabel → {x, V[x]}, LabelStyle → Directive[Bold], PlotRange → All]
```



In[43]:=
```
EL1[E01_, k1_, w01_, θ_, x_, y_, z_] :=
```

$$\frac{E01}{\sqrt{1+\left(\frac{x\cos[\theta]-y\sin[\theta]}{\frac{w01^2\,k1}{2}}\right)^2}}\,\text{Exp}\left[-\frac{(y\cos[\theta]+x\sin[\theta])^2+z^2}{\left(w01\sqrt{1+\left(\frac{x\cos[\theta]-y\sin[\theta]}{\frac{w01^2\,k1}{2}}\right)^2}\right)^2}\right]\text{Exp}[I\,k1\,(x\cos[\theta]-y\sin[\theta])]$$

```
EL2[E02_, k2_, w02_, θ_, x_, y_, z_] :=
```

$$\frac{E02}{\sqrt{1+\left(\frac{x\cos[\theta]-y\sin[\theta]}{\frac{w02^2\,k2}{2}}\right)^2}}\,\text{Exp}\left[-\frac{(y\cos[\theta]+x\sin[\theta])^2+z^2}{\left(w02\sqrt{1+\left(\frac{x\cos[\theta]-y\sin[\theta]}{\frac{w02^2\,k2}{2}}\right)^2}\right)^2}\right]\text{Exp}[I\,k2\,(x\cos[\theta]-y\sin[\theta])]$$

```
E1 := EL1[0.7, 1, 3, Pi/360, x0, y0, 0]
E2 := EL2[1, 2.5, 4, Pi/360, x0, y0, 0]
Etot := Abs[(E1)]^2 - Abs[(E2)]^2
```

In[48]:=
```
Plot3D[-Etot, {x0, -45, 45}, {y0, -10, 10}, BaseStyle -> {FontSize → 14},
 Boxed → False, AxesLabel → {x, y, V[x]}, ColorFunction → "Rainbow",
 Mesh → None, LabelStyle → Directive[Bold], PlotRange → All]
```

Out[48]=