In[42]:=

In[43]:= $\int_0^1 \text{Cos}[((4\pi/(\text{Sqrt}[3]*h))*\text{Sin}[\theta])*t+((4\pi/\text{Sqrt}[3])*y)]\,dy$

Out[43]= $$\frac{\sqrt{3}\ \text{Cos}\left[\frac{2\pi(h+2\,t\,\text{Sin}[\theta])}{\sqrt{3}\ h}\right]\ \text{Sin}\left[\frac{2\pi}{\sqrt{3}}\right]}{2\pi}$$

In[44]:=
```
f1 = Cos[ ((4 π/ (Sqrt[3] * h)) * Sin[θ]) * t + ( (4 π/ Sqrt[3]) * y)]
Integrate[f1, {x, 0, 1}, {y, 0, 1}]
```

Out[44]= $$\text{Cos}\left[\frac{4\pi y}{\sqrt{3}}+\frac{4\pi\,t\,\text{Sin}[\theta]}{\sqrt{3}\ h}\right]$$

Out[45]= $$\frac{\sqrt{3}\ \text{Cos}\left[\frac{2\pi(h+2\,t\,\text{Sin}[\theta])}{\sqrt{3}\ h}\right]\ \text{Sin}\left[\frac{2\pi}{\sqrt{3}}\right]}{2\pi}$$

In[46]:=

In[47]:=

In[48]:=
```
f2 =
 Cos[ ((2 π/h) * (Cos[θ] - (1/Sqrt[3]) * Sin[θ])) * t + (2 π * (x - (1/Sqrt[3]) * y))]
Integrate[f2, {x, 0, 1}, {y, 0, 1} ]
```

Out[48]= $$\text{Cos}\left[2\pi\left(x-\frac{y}{\sqrt{3}}\right)+\frac{2\pi\,t\left(\text{Cos}[\theta]-\frac{\text{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right]$$

Out[49]= 0

In[50]:=
```
f3 =
 Cos[ ((2 π/h) * (Cos[θ] + (1/Sqrt[3]) * Sin[θ])) * t + (2 π * (x + (1/Sqrt[3]) * y))]
Integrate[f3, {x, 0, 1}, {y, 0, 1} ]
```

Out[50]= $$\text{Cos}\left[2\pi\left(x+\frac{y}{\sqrt{3}}\right)+\frac{2\pi\,t\left(\text{Cos}[\theta]+\frac{\text{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right]$$

Out[51]= 0

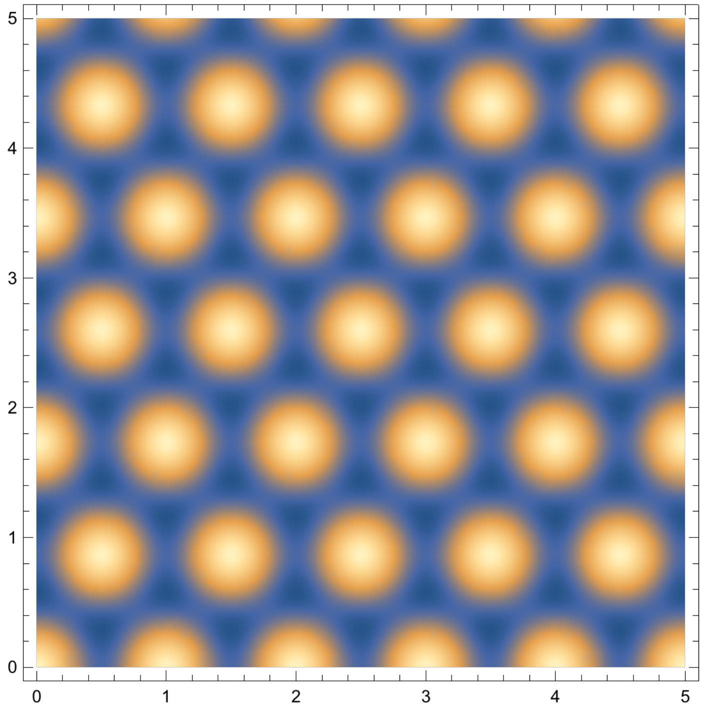
In[52]:=
```
ffull = f1 + f2 + f3
Integrate[ffull, {x, 0, 1}, {y, 0, √3} ]
```

Out[52]= $$\text{Cos}\left[\frac{4\pi y}{\sqrt{3}}+\frac{4\pi\,t\,\text{Sin}[\theta]}{\sqrt{3}\ h}\right]+\text{Cos}\left[2\pi\left(x-\frac{y}{\sqrt{3}}\right)+\frac{2\pi\,t\left(\text{Cos}[\theta]-\frac{\text{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right]+$$
$$\text{Cos}\left[2\pi\left(x+\frac{y}{\sqrt{3}}\right)+\frac{2\pi\,t\left(\text{Cos}[\theta]+\frac{\text{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right]$$

Out[53]= 0

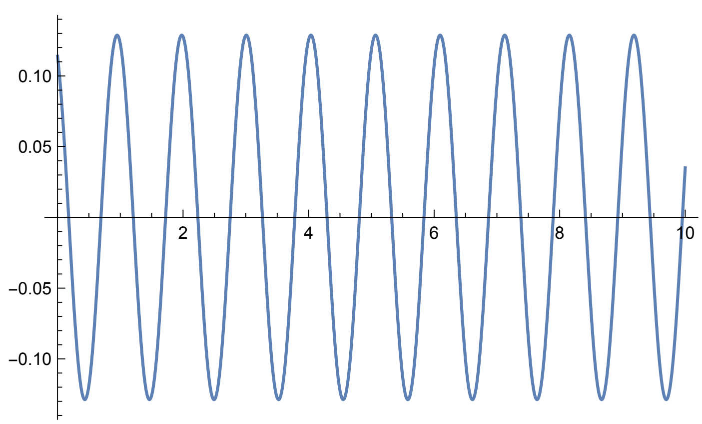
In[54]:=
```
ffull1 = (Cos[4 π y/√3 + 4 π t Sin[θ]/(√3 h)] + Cos[2 π (x - y/√3) + 2 π t (Cos[θ] - Sin[θ]/√3)/h] +
    Cos[2 π (x + y/√3) + 2 π t (Cos[θ] + Sin[θ]/√3)/h]) /. {θ → 0, t → 0, h → 20};
DensityPlot[f, {x, 0, 5}, {y, 0, 5}, PlotPoints → 50]
```

Out[55]=



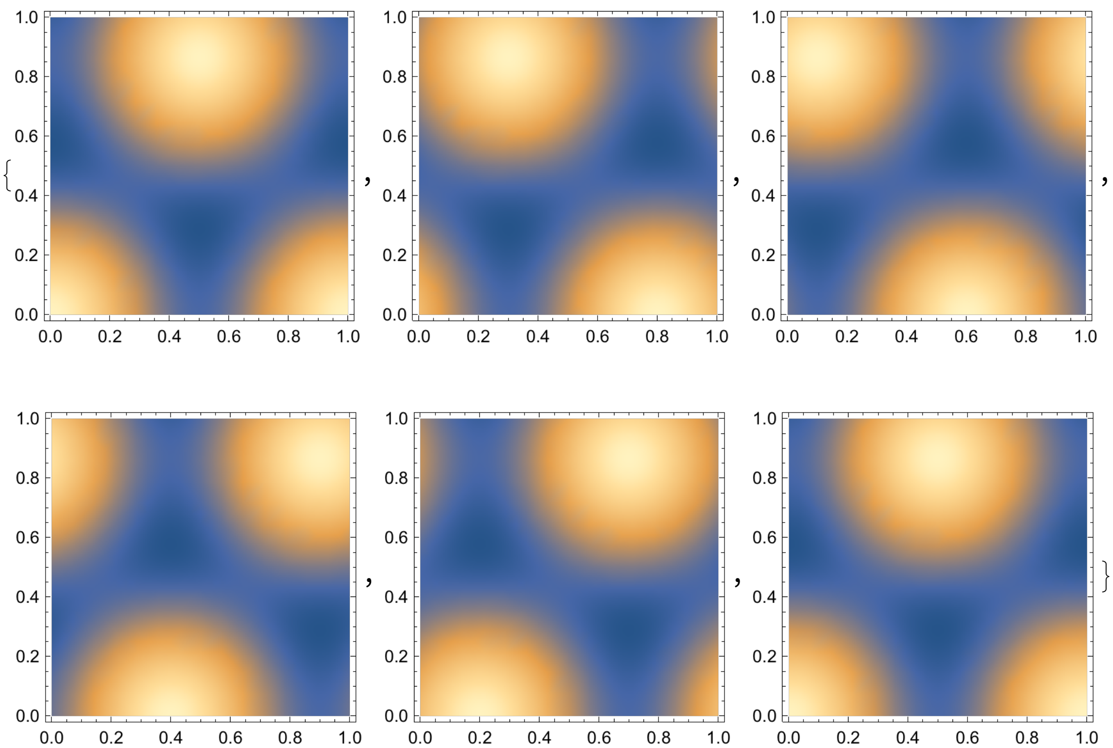
In[56]:=
```
Plot[√3 Cos[2 π (h+2 t Sin[θ])/(√3 h)] Sin[2 π/√3]/(2 π) /. {θ → 1, h → 1}, {t, 0, 10}]
```

Out[56]=



In[57]:= $$\text{ffull2}[\phi1\_,\ \phi2\_,\ h\_] := \left(\text{Cos}\left[\frac{4\,\pi\,\phi2}{\sqrt{3}} + \frac{4\,\pi\,y}{\sqrt{3}\ h}\right] + \text{Cos}\left[2\,\pi\left(\phi1 - \frac{\phi2}{\sqrt{3}}\right) + \frac{2\,\pi\left(x - \frac{y}{\sqrt{3}}\right)}{h}\right] + \text{Cos}\left[2\,\pi\left(\phi1 + \frac{\phi2}{\sqrt{3}}\right) + \frac{2\,\pi\left(x + \frac{y}{\sqrt{3}}\right)}{h}\right]\right);$$

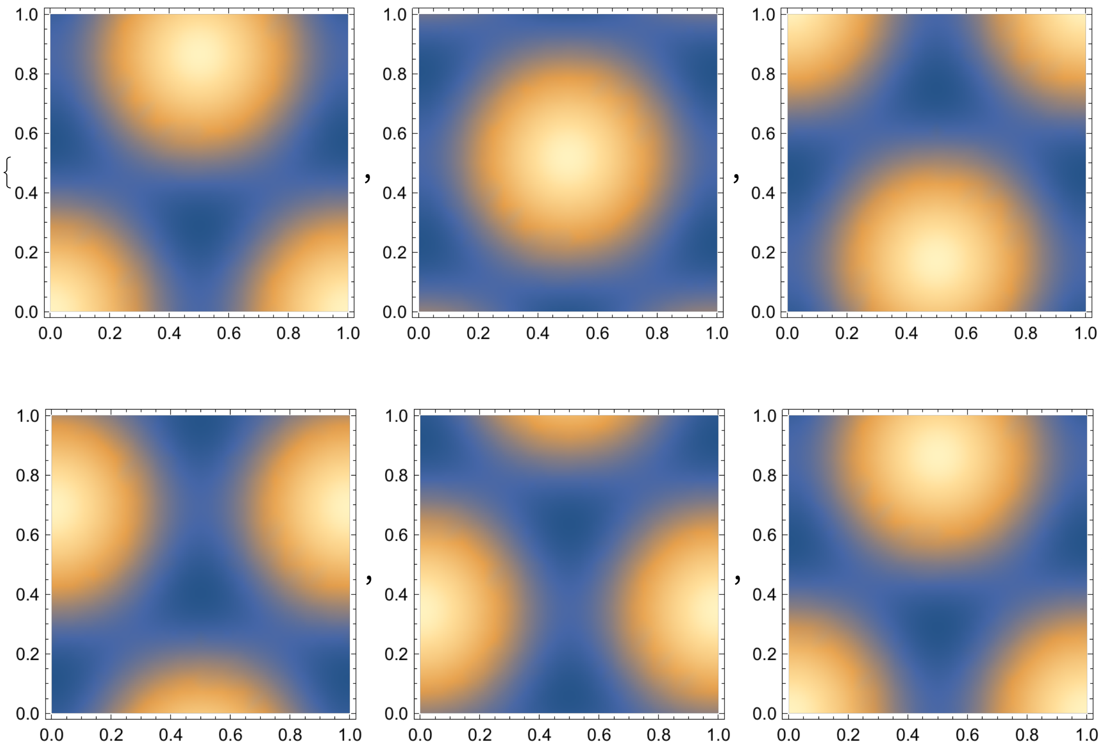
```
Table[DensityPlot[ffull2[ϕ, 0, 1], {x, 0, 1}, {y, 0, 1}], {ϕ, 0, 1, .2}]
```

Out[58]= 

In[59]:=
$$\texttt{ffull3[}\phi 1\_, \phi 2\_, h\_\texttt{] :=} \left(\mathrm{Cos}\left[\frac{4\pi\phi 2}{\sqrt{3}} + \frac{4\pi y}{\sqrt{3}\,h}\right] + \mathrm{Cos}\left[2\pi\left(\phi 1 - \frac{\phi 2}{\sqrt{3}}\right) + \frac{2\pi\left(x - \frac{y}{\sqrt{3}}\right)}{h}\right] + \mathrm{Cos}\left[2\pi\left(\phi 1 + \frac{\phi 2}{\sqrt{3}}\right) + \frac{2\pi\left(x + \frac{y}{\sqrt{3}}\right)}{h}\right]\right);$$

```
Table[DensityPlot[ffull3[0, ϕ, 1], {x, 0, 1}, {y, 0, 1}], {ϕ, 0, √3, √3/5}]
```

Out[60]=



In[61]:=
$$\texttt{f10} = \left(\mathrm{Cos}\left[\frac{4\pi y}{\sqrt{3}} + \frac{4\pi t\,\mathrm{Sin}[\theta]}{\sqrt{3}\,h}\right] + \mathrm{Cos}\left[2\pi\left(x - \frac{y}{\sqrt{3}}\right) + \frac{2\pi t\left(\mathrm{Cos}[\theta] - \frac{\mathrm{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right] + \mathrm{Cos}\left[2\pi\left(x + \frac{y}{\sqrt{3}}\right) + \frac{2\pi t\left(\mathrm{Cos}[\theta] + \frac{\mathrm{Sin}[\theta]}{\sqrt{3}}\right)}{h}\right]\right);$$

```
Integrate[f10, {x, 0, 1}, {y, 0, √3}]
```

Out[62]= 0