```
a = 100.; b = 1.;
```

$$Ex = -D\left[\frac{\text{Sin}\left[\frac{\pi x}{a}\right]\ \text{Sinh}\left[\frac{\pi y}{a}\right]}{\text{Sinh}\left[\frac{\pi b}{a}\right]}, x\right];$$

$$Ey = -D\left[\frac{\text{Sin}\left[\frac{\pi x}{a}\right]\ \text{Sinh}\left[\frac{\pi y}{a}\right]}{\text{Sinh}\left[\frac{\pi b}{a}\right]}, y\right];$$

```
EE = Ex^2 + Ey^2;

Energy = 0.5 NIntegrate[EE, {x, 0, 100}, {y, 0, 1}]
```

```
25.0082
```

```
Plot3D[(Sin[(π x) / a] Sinh[(π y) / a]) / Sinh[(π b) / a], {x, 0, 100}, {y, 0, 1}]
```