

## Multiple Source Interference - Time Averaged Projection

Add together  $N+1$  spherical wave sources spread out evenly over a distance  $d$  along the  $y$  axis. Then plot the time average of the wave intensity as a function of  $y$  at a fixed value of  $x$ .

```
val = {k -> 8 π, d -> 1, N -> 4, ω -> π / 4};
```

$$\text{wfunc}[x_, y_, t_] = \sum_{n=-N/2}^{N/2} \frac{1}{\sqrt{x^2 + \left(y - \frac{nd}{N}\right)^2}} \text{Sin}\left[k \sqrt{x^2 + \left(y - \frac{nd}{N}\right)^2} - \omega t\right];$$

```
Plot[Evaluate[ $\frac{1}{8} \sum_{t=1}^8 \text{wfunc}[4, y, t]^2$  /. val], {y, -3, 3}, GridLines -> Automatic,
Frame -> True, PlotRange -> {{-3, 3}, {0, 1}}, PlotStyle -> {RGBColor[1, 0, 0]}];
```

