Spherical Wave from Moving Source

Sum up periodic spherical wavefronts from a moving source. Wave velocity is c and source velocity is v. The start time of each successive wavefront is ts. The wavefronts have Gaussian shapes. Try v=1, c=1.5 to illustrate the Doppler effect, v=c=1.5 for a shock wave, and v=2, c=1.5 for a bow wave.

```
val = { c → 1.5, v → 1, width → 0.1};
```

$$\text{wfunc}[x\_, y\_, t\_] = \sum_{ts=0}^{20} \frac{e^{-\left(\sqrt{(x-v\,ts)^2+y^2}-c\,(t-ts)\right)^2/\text{width}}}{\sqrt{(x-v\,ts)^2+y^2}} + 0.1;$$

```
wplot[t_] := DensityPlot[Evaluate[wfunc[x, y, t] /. val],
   {x, -10, 30}, {y, -20, 20}, PlotRange → {0, 1}, ColorFunction → Hue, PlotPoints → 80];
```

```
Table[wplot[t], {t, 0, 20, 1}];
```