Diffraction_alt_rows: X-ray beam striking straight vs. bent vs. staggered rows of 11 points

Time: $t := FRAME$ Angle: $\theta_x := FRAME \cdot \frac{2 \cdot \pi}{360}$ Radius Function: $R(x_0, y_0, x, y) := \sqrt{(x_0 - x)^2 + (y_0 - y)^2}$

X-ray Beam (rotatable row of circular wave sources): $x_{ctr} := -100 \cdot \sin(\theta_x)$ $y_{ctr} := 100 \cdot \cos(\theta_x)$ $\lambda := 10$ $\omega := 1$ $k := \frac{2\pi}{\lambda}$ $v := \frac{\omega}{k}$

$$Xray(x, y, t) := \sum_{i=-10}^{10} \frac{\cos(k \cdot R(x_{ctr} + 5 \cdot i \cdot \cos(\theta_x), y_{ctr} + 5 \cdot i \cdot \sin(\theta_x), x, y) - \omega \cdot t)}{R(x_{ctr} + 5 \cdot i \cdot \cos(\theta_x), y_{ctr} + 5 \cdot i \cdot \sin(\theta_x), x, y) + 1} \qquad Xray_{now}(x, y) := Xray(x, y, t)$$

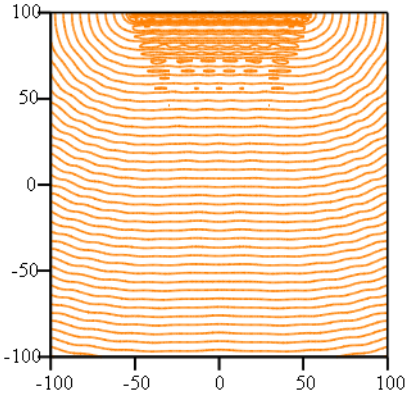
Diffracting Single Point: $$D(x_d, y_d, x, y, t) := \frac{Xray\left[x_d, y_d, t - \left(\frac{1}{v}\right) \cdot R(x_d, y_d, x, y)\right]}{R(x_d, y_d, x, y) + 1}$$

Diffracting Straight Row: $$D_{straight\_total}(x, y, t) := \sum_{j=-5}^{5} D(5 \cdot j, 0, x, y, t) \qquad D_{straight\_now}(x, y) := D_{straight\_total}(x, y, t)$$

Diffracting Bent Row: $$D_{bent\_total}(x, y, t) := \sum_{j=-5}^{0} D(5 \cdot j, 0, x, y, t) + \sum_{j=1}^{5} D(5 \cdot j, 5 \cdot j, x, y, t) \qquad D_{bent\_now}(x, y) := D_{bent\_total}(x, y, t)$$

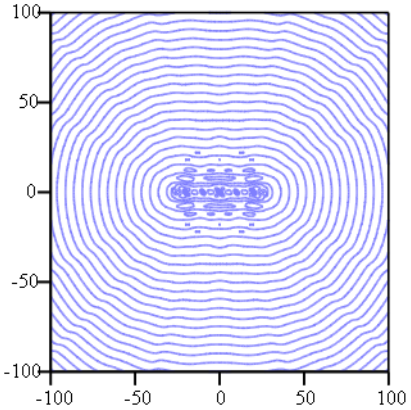
Diffracting Staggered Row: $$D_{staggered\_total}(x, y, t) := \sum_{j=-5}^{5} D\left[5 \cdot j, 1 \cdot (-1)^j, x, y, t\right] \qquad D_{staggered\_now}(x, y) := D_{staggered\_total}(x, y, t)$$

Incoming X-ray:



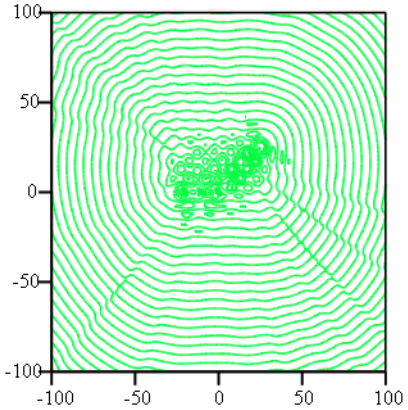
$Xray_{now}$

Diffraction from Straight Row:



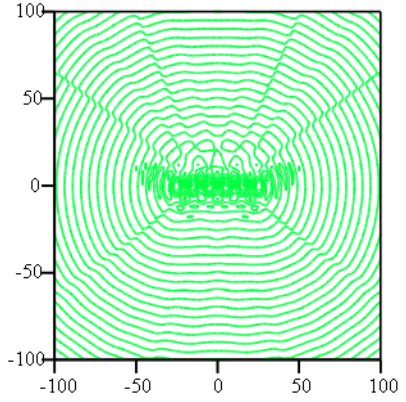
$D_{straight\_now}$

From Bent Row::



D_{bent_now}

From Staggered Row:



$D_{staggered\_now}$