## I. Overview

Given:

$$y = \Delta t + \Delta v \tag{1}$$

## II. Time-Domain

Since:

$$\Delta t = \frac{d_{\vec{ms}}}{c} \tag{2}$$

Where:

$$c = 343 \pm c_{\text{adj}} \tag{3}$$

$$c_{\text{adj}} = [0, 10] \tag{4}$$

$$\Delta D_{\vec{ms}} = \sqrt{(x_s - x_m)^2 + (y_s - y_m)^2} \tag{5}$$

Thus:

$$\Delta t = \frac{\sqrt{(x_s - x_m)^2 + (y_s - y_m)^2}}{343 \pm [0, 10]} \tag{6}$$

## III. Amplitude-Domain

If:

$$\begin{bmatrix} W \\ X \\ Y \end{bmatrix} = S * \begin{bmatrix} \sqrt{2} \\ \cos \Theta_s \\ \sin \Theta_s \end{bmatrix} \tag{7}$$

And:

$$m(\Theta, p) = (1-p) m_{\text{omni}} + p m_{\text{bi}} \tag{8}$$

Where:

$$m_{\text{omni}} = 1 \tag{9}$$

And:

$$m_{\text{bi}} = \sin \Theta_m + \cos \Theta_m \tag{10}$$

Then:

$$\Delta v = \begin{bmatrix} W \\ X \\ Y \end{bmatrix} * m(\Theta, p) \tag{11}$$

Which is:

$$\Delta v = S(1-p)\sqrt{2} + p(S \sin \Theta_m \sin \Theta_s + S \cos \Theta_m \cos \Theta_s) \tag{12}$$

However:

$$\Delta v = S(1-p)\sqrt{2} + pS(\cos(\Theta_m - \Theta_s)) \tag{13}$$

Which is:

$$\Delta v = S[(1-p)\sqrt(2) + p(\cos(\Theta_m - \Theta_s))] \tag{14}$$

Thus:

$$m(\Theta_{m-s}, p) = (1-p)\sqrt{2} + p \cos \Theta \tag{15}$$

And:

$$\Delta v = S * m(\Theta_{m-s}, p) \tag{16}$$

## IV. Conclusion

Therefore:

$$y[n] = n((1-p)\sqrt{2} + p \cos \Theta_{m-s}) + \hat{t} \frac{\sqrt{(x_s - x_m)^2 + (y_s - y_m)^2}}{343 \pm [0, 10]} \tag{17}$$