
Sinusoid Targets

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Sinusoid Wave Functions

Max dims of the parts is 406 mmW x 355mm L x 406mm H

```
close all; clear
```

```
x = 0:.1:310;
```

```
% Sinusoid
```

```
y = @(x, lambda, A) -A*cos(2*pi./lambda * x);
```

```
% Chirp
```

```
k = @(lam0, lam1, x) (1/lam1-1/lam0)/(x(end)-x(1)); %freq rate change
```

```
f = @(lam0, lam1, x) (1/lam0) + k(lam0, lam1, x)*x./2;
```

```
fmchirp = @(lam0, lam1, x, A) A * cos(2*pi*f(lam0, lam1, x).*x);
```

Row 1: Period of 150-mm (amplitude 30-mm)

```
lambda = 150;
```

```
A = 30;
```

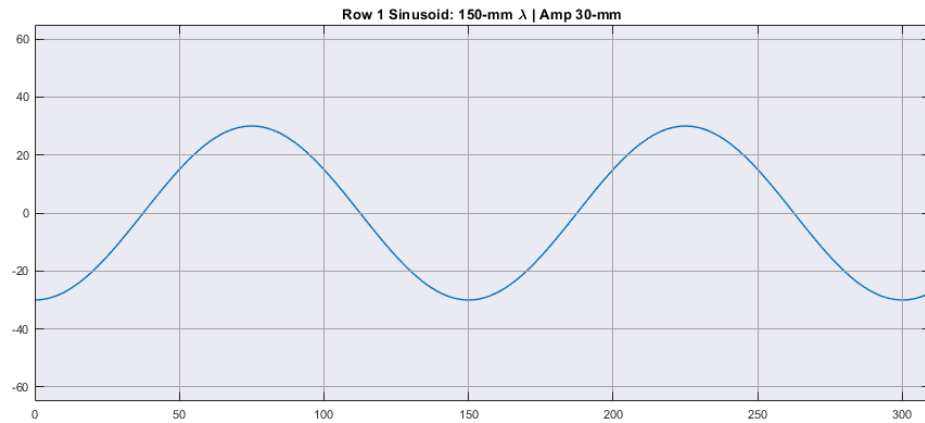
```
figure(1);
```

```
plot(x, y(x, lambda, A), 'LineWidth', 1);
```

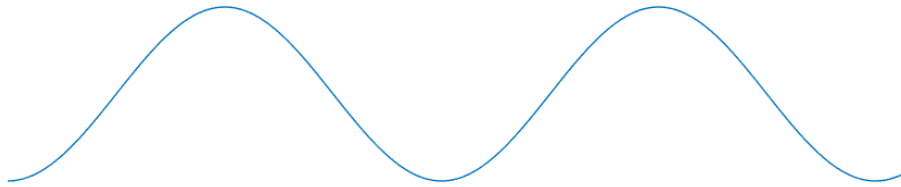
```
title(['Row 1 Sinusoid: ' num2str(lambda) '-mm \lambda | Amp ']);
```

```
num2str(A) '-mm']);
```

```
axis square equal;
```

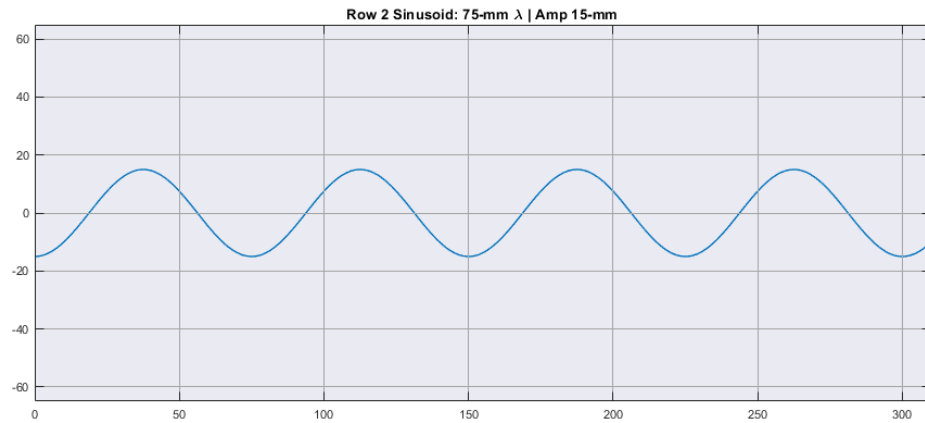


```
axis off;  
title '';  
saveas(gcf, 'sineRow1.svg');
```

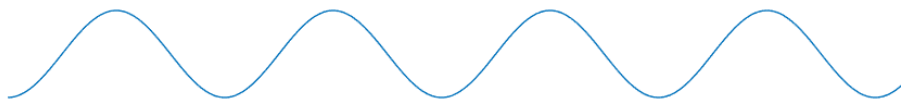


Row 2: Period of 75-mm (amplitude 15-mm)

```
lambda = 75;  
A = 15;  
figure(2);  
plot(x,y(x,lambda,A), 'LineWidth',1);  
title(['Row 2 Sinusoid: ' num2str(lambda) '-mm \lambda | Amp '  
    num2str(A) '-mm']);  
axis square equal;  
export_fig sineRow2.png;
```

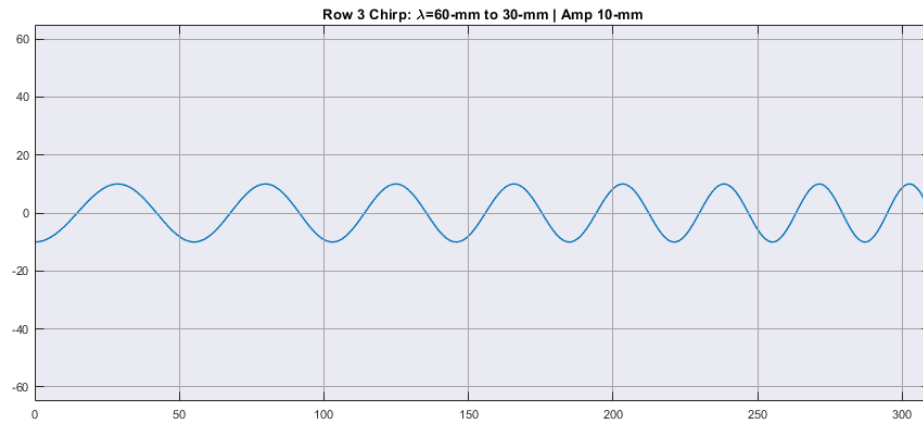


```
axis off;
title '';
saveas(gcf, 'sineRow2.svg');
```

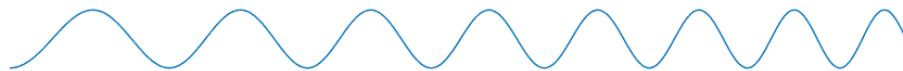


Row 3: Period of 60-mm to 30-mm (amplitude 10-mm)

```
lambda0 = 60;
lambda1 = 30;
A = 10;
figure(3)
plot(x, -fmchirp(lambda0, lambda1, x, A), 'LineWidth', 1);
title(['Row 3 Chirp: \lambda=' num2str(lambda0) '-mm to '
      num2str(lambda1) '-mm | Amp ' num2str(A) '-mm']);
axis square equal;
```

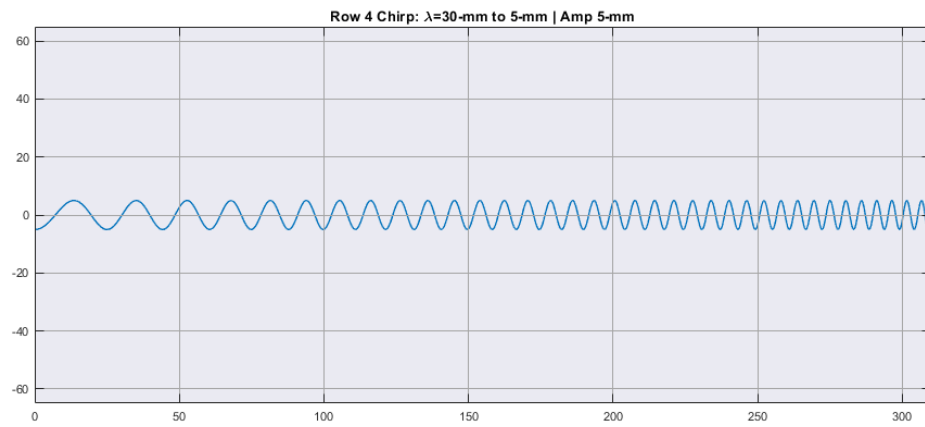


```
axis off;
title '';
saveas(gcf, 'sineRow3.svg');
```



Row 4: Period of 30-mm to 5-mm (amplitude 5-mm)

```
lambda0 = 30;
lambda1 = 5;
A = 5;
figure(4);
plot(x, -fmchirp(lambda0, lambda1, x, A), 'LineWidth', 1);
title(['Row 4 Chirp: \lambda=' num2str(lambda0) '-mm to '
      num2str(lambda1) '-mm | Amp ' num2str(A) '-mm']);
axis square equal;
```



```
axis off;  
title '';  
saveas(gcf, 'sineRow4.svg');
```



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