LAMPIRAN

Lampiran 1

Script Matlab untuk TSA bantalan bola normal

```
%Script Time Synchronous Averaging (TSA) Bantalan Normal

clear all;
clc;
close all;

%Load Data dan Masukkan Input
load('E:\matlab\data\Bearing_Normal\data3\Bearing_Normal5.mat');
fs = 17066;                                  %frekuensi sampling Hz (fs)
fo = 10;                          %Durasi Pengambilan Sampel (detik)(fo)
x = data_all(:,1);                      %semua data di akselerometer (x)
tacho = data_all(:,2);                    %semua data di tachometer (tp)
L = fs*fo;                               %panjang data (length of signal)
NFFT = 2^nextpow2(L);                   %Next power of 2 from length of y
Y = fft(x,NFFT)/L;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude = 2*abs(Y(1:NFFT/2+1));
[rpm,t,tp] = tachorpm(tacho,fs);
ta = tsa(x,fs,tp,'Numrotations',10);

L2 = length(ta);                     %panjang data ke 2(length of signal)
NFFT = 2^nextpow2(L);                   %Next power of 2 from length of y
Y2 = fft(ta,NFFT)/L2;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude2 = 2*abs(Y2(1:NFFT/2+1));

%Plot Amplitudo Domain Waktu
figure (1)
plot(x)
title('Domain Waktu Sebelum TSA Bantalan Normal')
axis([0 8720 -3 3])
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum.
figure (2)
plot(f,Amplitude)
axis([0 1000 0 0.2])
title('Spektrum Sebelum TSA Bantalan Normal')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

```
%Plot Amplitudo Domain Waktu Setelah TSA
figure (3)
plot(ta)
title('Domain Waktu Setelah TSA Bantalan Normal')
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum Setelah TSA.
figure (4)
plot(f,Amplitude2)
axis([0 1000 0 0.05])
title('Spektrum Setelah TSA Bantalan Normal')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Lampiran 2

Script Matlab untuk TSA bantalan bola cacat lintasan luar

```
%Script Time Synchronous Averaging (TSA) Bantalan Outer Race

clear all;
clc;
close all;

%Load Data dan Masukkan Input
load('E:\matlab\data\Bearing_Rusak_Outer\data1\Bearing_Rusak_Outer5.
mat');
fs = 17066;                                  %frekuensi sampling Hz (fs)
fo = 10;                          %Durasi Pengambilan Sampel (detik)(fo)
x = data_all(:,1);                     %semua data di akselerometer (x)
tacho = data_all(:,2);                   %semua data di tachometer (tp)
L = fs*fo;                              %panjang data (length of signal)
NFFT = 2^nextpow2(L);                  %Next power of 2 from length of y
Y = fft(x,NFFT)/L;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude = 2*abs(Y(1:NFFT/2+1));
[rpm,t,tp] = tachorpm(tacho,fs);
ta = tsa(x,fs,tp,'NumRotations',10);

L2 = length(ta);                     %panjang data ke 2(length of signal)
NFFT = 2^nextpow2(L);                   %Next power of 2 from length of y
Y2 = fft(ta,NFFT)/L2;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude2 = 2*abs(Y2(1:NFFT/2+1));
```

```
%Plot Amplitudo Domain Waktu
figure (1)
plot(x)
title('Domain Waktu Sebelum TSA Bantalan Cacat Outer Race')
axis([0 8720 -4 4])
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum.
figure (2)
plot(f,Amplitude)
axis([0 1000 0 0.2])
title('Spektrum Sebelum TSA Bantalan Cacat Outer Race')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%Plot Amplitudo Domain Waktu Setelah TSA
figure (3)
plot(ta)
title('Domain Waktu Setelah TSA Bantalan Cacat Outer Race')
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum Setelah TSA.
figure (4)
plot(f,Amplitude2)
axis([0 1000 0 0.1])
title('Spektrum Setelah TSA Bantalan Cacat Outer Race')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Lampiran 3

Script Matlab untuk TSA bantalan bola cacat lintasan dalam

```
%Script Time Synchronous Averaging (TSA) Bantalan Inner Race

clear all;
clc;
close all;

%Load Data dan Masukkan Input
load('E:\matlab\data\Bearing_Rusak_Inner\data7\Bearing_Rusak_Inner5.
mat');
fs = 17066;                              %frekuensi sampling Hz (fs)
fo = 10;                       %Durasi Pengambilan Sampel (detik)(fo)
x = data_all(:,1);                   %semua data di akselerometer (x)
tacho = data_all(:,2);                 %semua data di tachometer (tp)
```

```
L = fs*fo;                              %panjang data (length of signal)
NFFT = 2^nextpow2(L);                  %Next power of 2 from length of y
Y = fft(x,NFFT)/L;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude = 2*abs(Y(1:NFFT/2+1));
[rpm,t,tp] = tachorpm(tacho,fs);
ta = tsa(x,fs,tp,'NumRotations',10);

L2 = length(ta);                    %panjang data ke 2(length of signal)
NFFT = 2^nextpow2(L);                  %Next power of 2 from length of y
Y2 = fft(ta,NFFT)/L2;
f = fs/2*linspace(0,1,NFFT/2+1);
Amplitude2 = 2*abs(Y2(1:NFFT/2+1));
%Plot Amplitudo Domain Waktu
figure (1)
plot(x)
title('Domain Waktu Sebelum TSA Bantalan Cacat Inner Race')
axis([0 8720 -30 30])
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum.
figure (2)
plot(f,Amplitude)
axis([0 1000 0 0.7])
title('Spektrum Sebelum TSA Bantalan Cacat Inner Race')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%Plot Amplitudo Domain Waktu Setelah TSA
figure (3)
plot(ta)
title('Domain Waktu Setelah TSA Bantalan  Cacat Inner Race')
xlabel('sampel')
ylabel('Amplitudo')

% Plot single-sided amplitude spectrum Setelah TSA.
figure (4)
plot(f,Amplitude2)
axis([0 1000 0 0.5])
title('Spektrum Setelah TSA Bantalan  Cacat Inner Race')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```