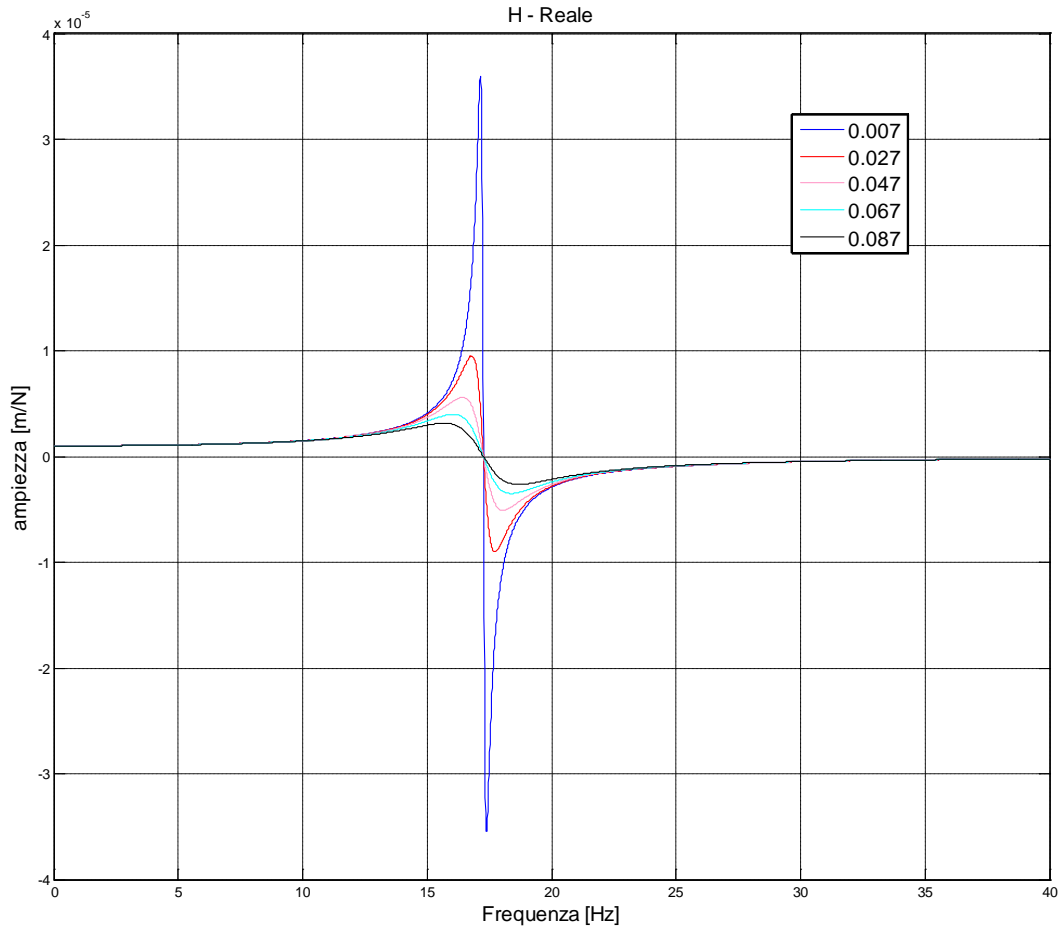
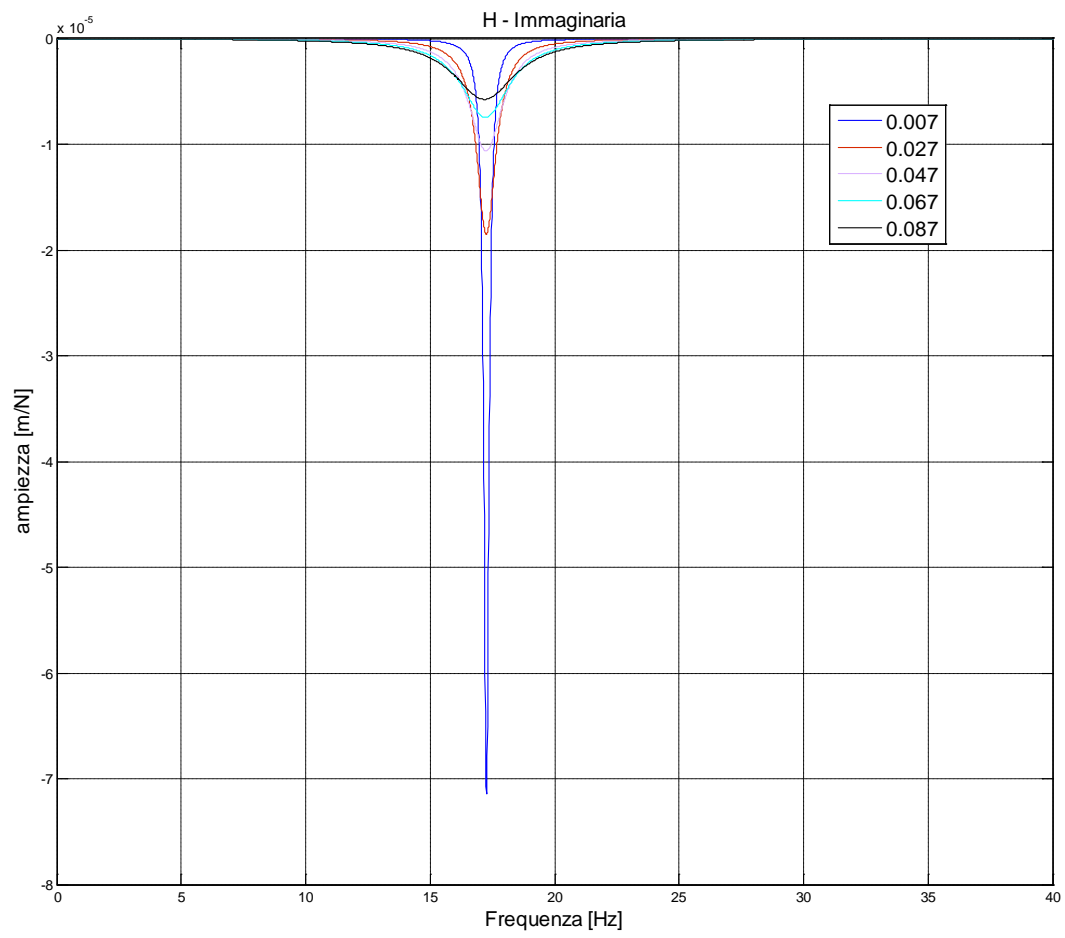


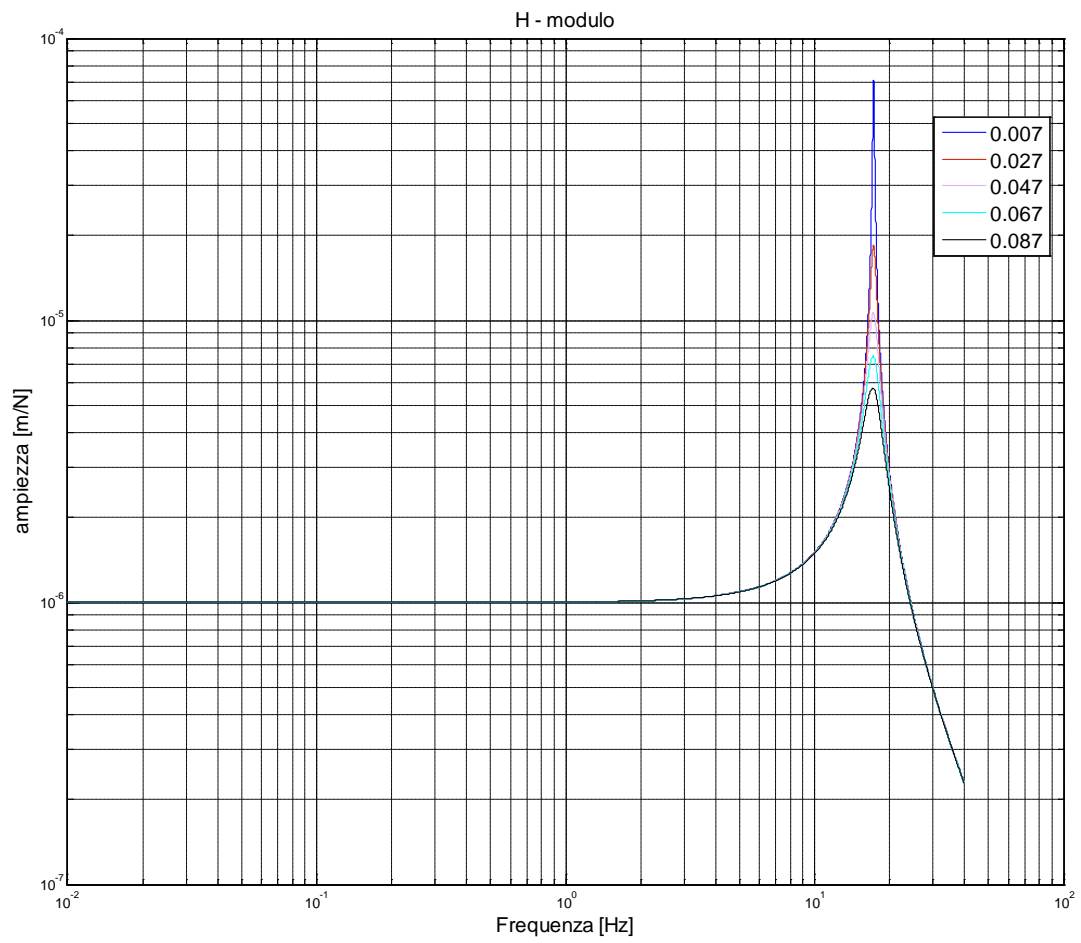
Per un sistema ad un grado di libertà

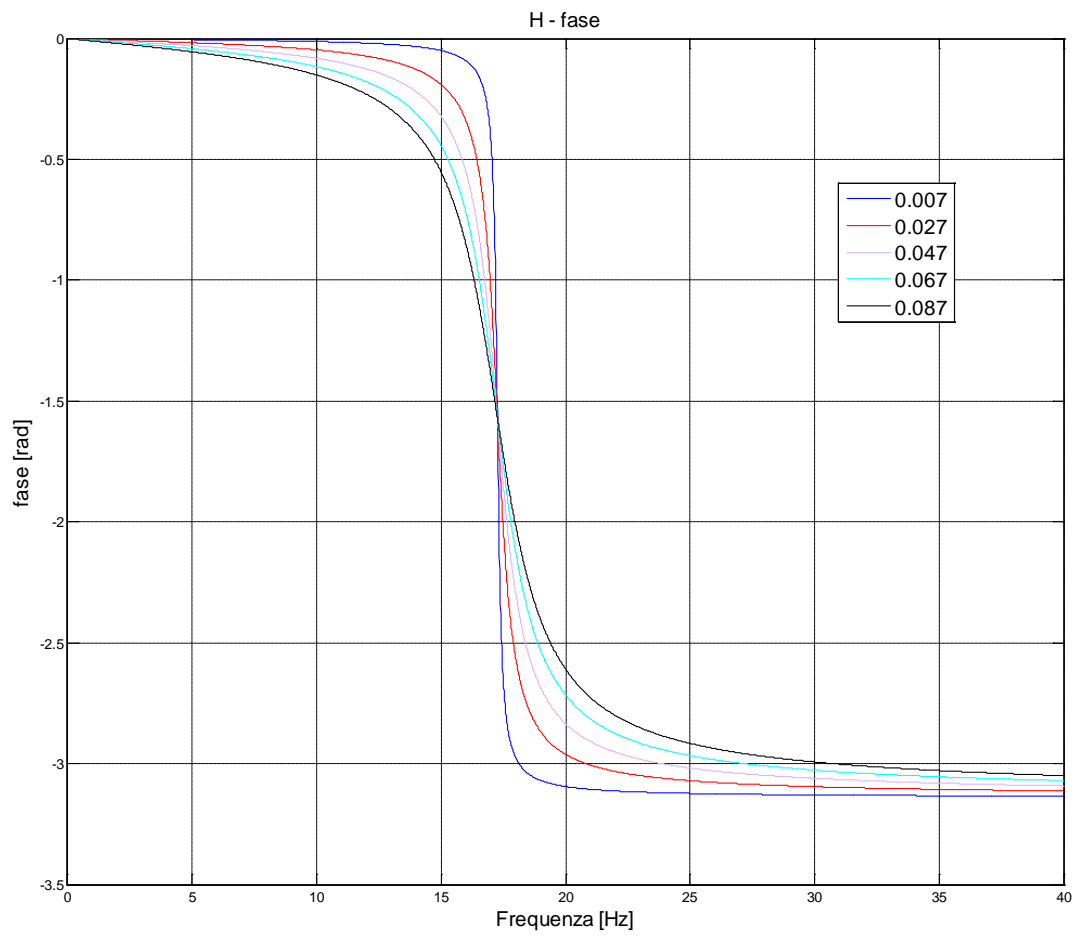
$$\bar{H} = \frac{1}{k} \frac{1 - r^2 - i2\xi r}{(1 - r^2)^2 + (2\xi r)^2}$$

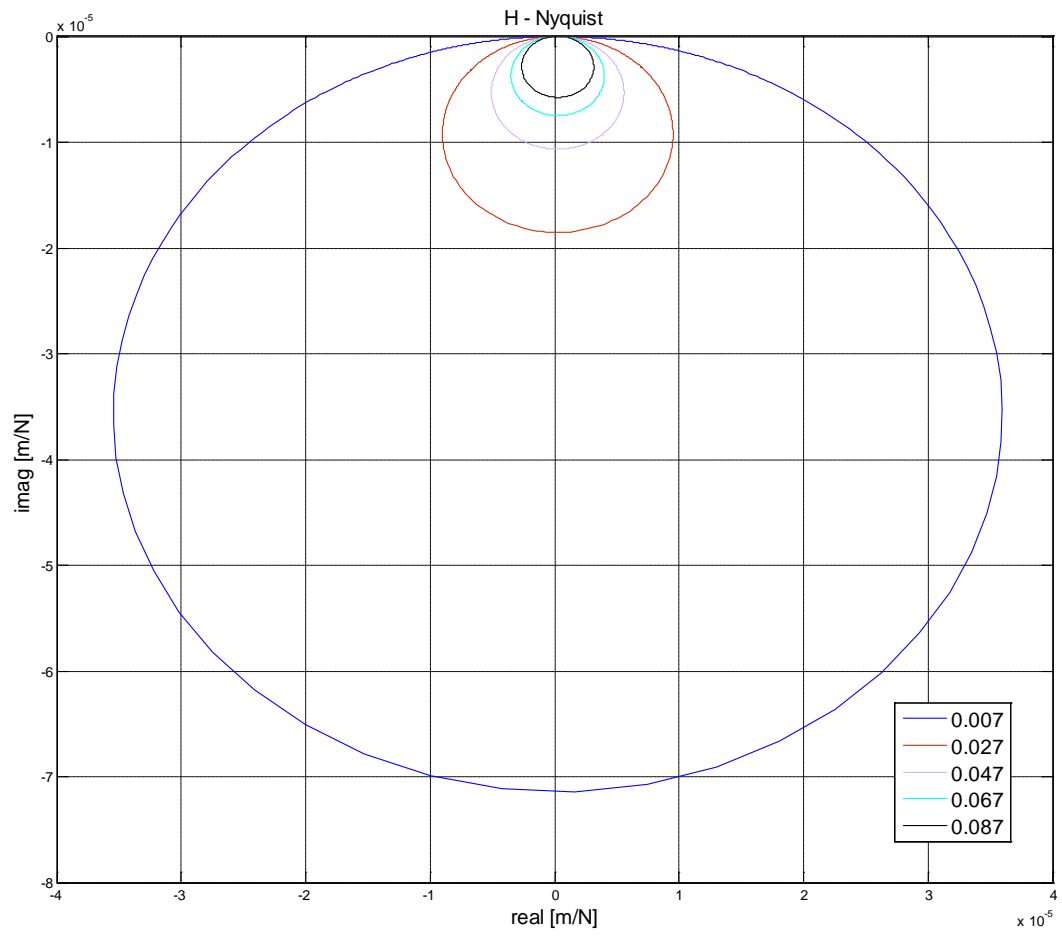
Sia  $m=85\text{kg}$ ,  $k=100000\text{N/m}$ , si mostra il grafico della FRF al variare dello smorzamento modale.











## Listato Matlab

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Vibrazioni libere del sistema                                     %
% a due gradi di libert di masse 3m e m                          %
%                                                                    %
%                                                                    %
%                                                                    %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
close all
clear;
clc;
%%DATI
```

```
m=85;
```

```
k=1000000;
```

```
omega_nat=sqrt(k/m);
```

```
%calcolo delle FRF: Hmm, Hem
```

```
dF=0.01;
```

```
freq=[0:dF:40];
```

```
omega=2*pi*freq;
```

```
r=omega/omega_nat;
```

```
figure
```

```
for zita=0.007:0.02:0.1
```

```
num=1-r.^2-i*2*r*zita;
```

```
den=(1-r.^2).^2+(2*r*zita).^2;
```

```
H=(1/k)*num./den;
```

```
%%reale
```

```
plot(freq, real(H))
```

```
xlabel('Frequenza [Hz]', 'fontsize', 14);
```

```
ylabel('ampiezza [m/N] ', 'fontsize', 14);
```

```
title('H - Reale', 'fontsize', 14), grid
```

```
hold on
```

```
end
```

```
figure
```

```
for zita=0.007:0.02:0.1
```

```
num=1-r.^2-i*2*r*zita;
```

```
den=(1-r.^2).^2+(2*r*zita).^2;
```

```
H=(1/k)*num./den;
```

```
plot(freq, imag(H))
```

```
xlabel('Frequenza [Hz]', 'fontsize', 14);
```

```
ylabel('ampiezza [m/N]', 'fontsize', 14);
```

```
title('H - Immaginaria', 'fontsize', 14), grid
```

```

hold on
end

%

figure
for zita=0.007:0.02:0.1
num=1-r.^2-i*2*r*zita;
den=(1-r.^2).^2+(2*r*zita).^2;
H=(1/k)*num./den;
loglog(freq, abs(H))
xlabel('Frequenza [Hz]', 'fontsize',14);
ylabel('ampiezza [m/N]', 'fontsize',14);
title('H - modulo', 'fontsize',14),grid
hold on
end

figure
for zita=0.007:0.02:0.1
num=1-r.^2-i*2*r*zita;
den=(1-r.^2).^2+(2*r*zita).^2;
H=(1/k)*num./den;
plot(freq, (angle(H)))
xlabel('Frequenza [Hz]', 'fontsize',14);
ylabel('fase [rad]', 'fontsize',14);
title('H - fase', 'fontsize',14),grid
hold on
end

figure
for zita=0.007:0.02:0.1
num=1-r.^2-i*2*r*zita;
den=(1-r.^2).^2+(2*r*zita).^2;
H=(1/k)*num./den;
plot(real(H), imag(H))
xlabel('real [m/N]', 'fontsize',14);
ylabel('imag [m/N] ', 'fontsize',14);
title('H - Nyquist', 'fontsize',14),grid
hold on
end

```

