

Modulazione AM

$$V_m = A_m \cos(\omega_m t) \text{ Modulante}$$

$$V_p = A_p \cos(\omega_p t) \text{ Portante}$$

$$V_{AM} = [A_p + A_m \cos(\omega_m t)] \cos(\omega_p t) \text{ Modulata}$$

Codice Scilab per gli andamenti temporali :

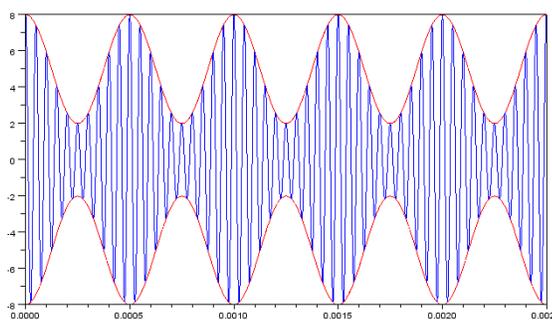
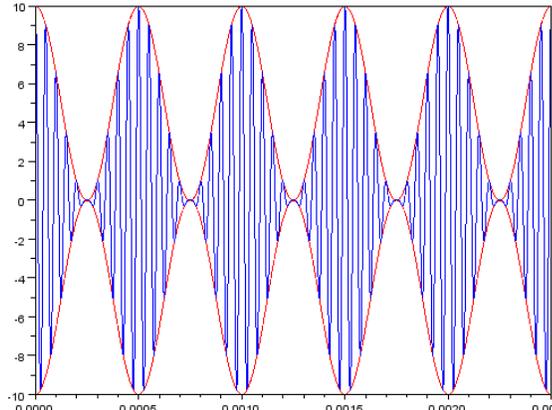
```
clf();
fp=20e3;
wp=2*%pi*fp;
Tp=1/fp;
Ap=5;
Am=0.1;
fm=2e3;
wm=2*%pi*fm;
```

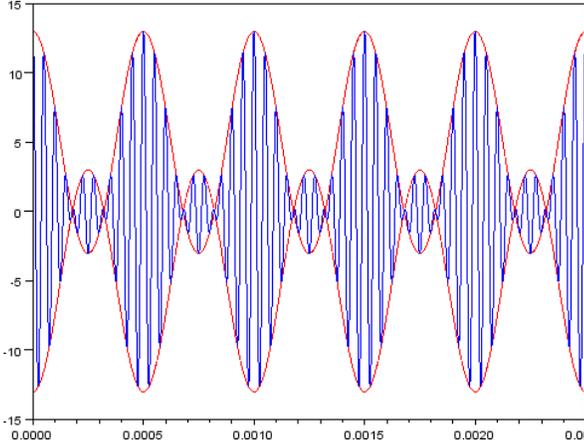
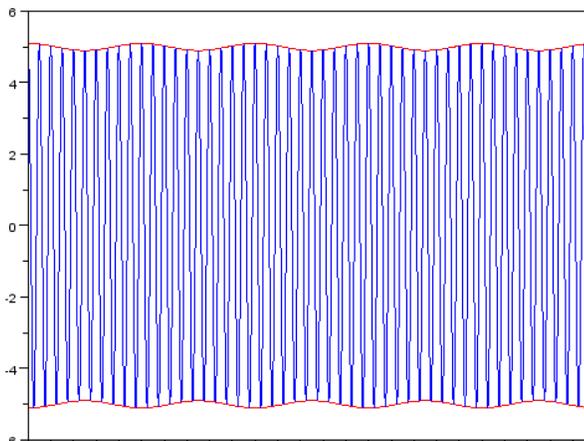
```
Tm=1/fm;
t=linspace(0,5*Tm,50000);
involuppo=Ap+Am*cos(wm*t);
yAM=[involuppo].*cos(wp*t);
plot(t,involuppo,'r');
plot(t,-involuppo,'r');
plot(t,yAM)
```

indice di modulazione :

$$m = \frac{A_m}{A_p} \xrightarrow{\text{in \%}} m_{\%} = \frac{A_m}{A_p} \cdot 100$$

Casi possibile al variare dell'indice di modulazione:

Indice di modulazione		Andamento temporale	
$m < 1$	$m_{\%} < 100\%$		<p>Ok $A_p=5$; $A_m=3$; $m_{\%}=3/5 \cdot 100=60\%$</p>
$m = 1$	$m_{\%} = 100\%$		<p>Caso limite $A_p=5$; $A_m=5$; $m_{\%}=5/5 \cdot 100=100\%$</p>

<p>$m > 1$</p>	<p>$m\% > 100\%$</p>		<p>Sovrammodulazione $A_p = 5;$ $A_m = 8;$ $m\% = 8/5 * 100 = 160\%$</p> <p>Non posso demodulare correttamente</p>
<p>$m \ll 1$</p>	<p>$m\% \ll 100\%$</p>		<p>Basso indice di modulazione $A_p = 5;$ $A_m = 0.1;$ $m\% = 0,1/5 * 100 = 2\%$</p> <p><i>La modulante incide poco sulla portante</i></p>