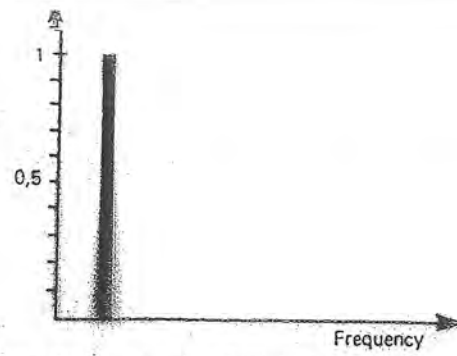
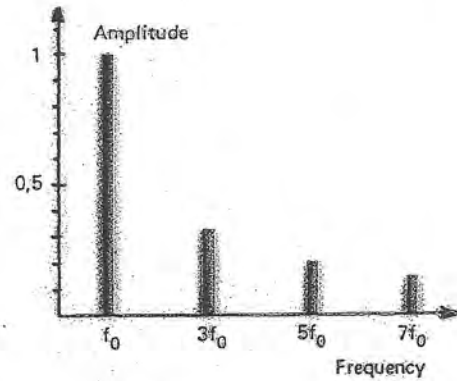
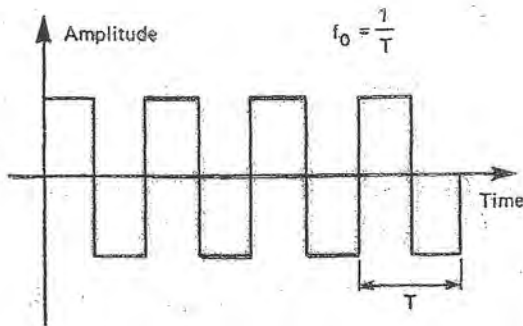
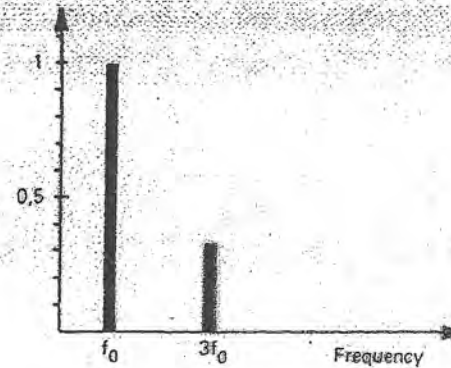
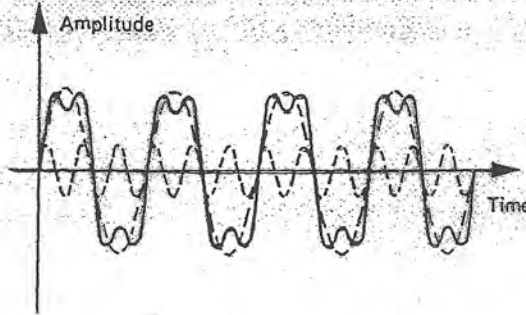


$$P(t) = A_0 \cos \omega t$$

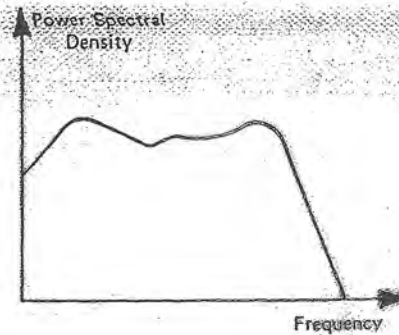
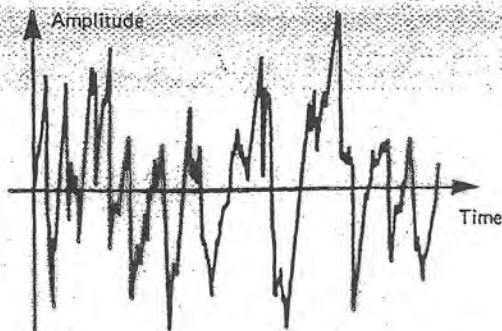
$$P(t) = A_0 \cos (\omega t + \Phi)$$



rappresentazione senza sfasamento
rappresentazione con sfasamento



$$p(t) = a_0/2 + \sum_{n=1}^{\infty} [a_n \cos(\omega_n t) + b_n \sin(\omega_n t)]$$



$$P(\tau) = \int_{-\infty}^{\infty} P(\omega) e^{j\omega\tau} d\omega$$

$$P(\omega) = \frac{1}{2\pi} \int_{-\infty}^{\infty} P(\tau) e^{-j\omega\tau} d\tau$$

ANALISI IN FREQUENZA

$$L_p(f) = 10 \log \frac{P_{eff}^2(f)}{P_0^2}$$

1) BANDE AD AMPIEZZA COSTANTE:

$$\Delta f = \text{cost}$$

2) BANDE AD AMPIEZZA PERCENTUALE COSTANTE: (AMPIEZZA RELATIVA COSTANTE)

$$\Delta f = k \cdot f_c \quad \left(\frac{\Delta f}{f_c} = \text{cost} \right) \Rightarrow \lg f_2 - \lg f_1 = \text{cost}$$

• BANDE DI 1/1 DI OTTAVA:

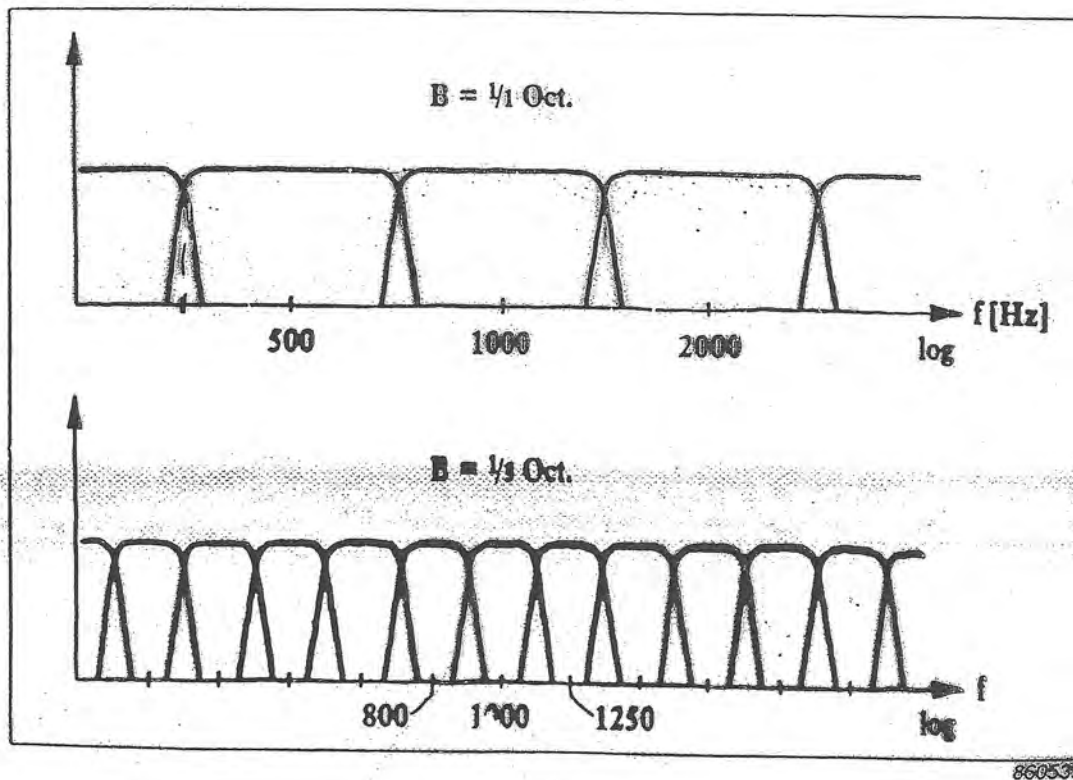
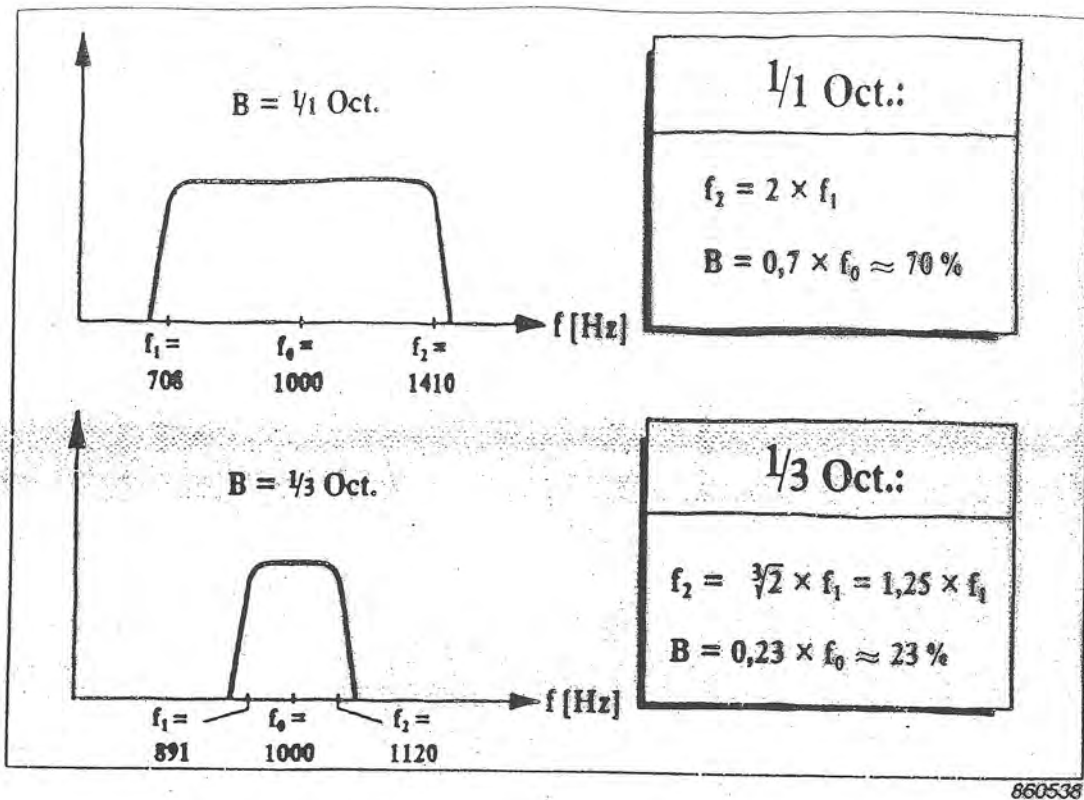
$$f_{sup} = 2 f_{inf} \Rightarrow \begin{cases} \Delta f = f_{sup} - f_{inf} = f_{inf} \\ f_c = \sqrt{f_{sup} \cdot f_{inf}} = \sqrt{2} f_{inf} \end{cases}$$

$$\Delta f / f_c = 1 / \sqrt{2} \approx 0,707$$

• BANDE DI 1/3 DI OTTAVA:

$$f_{sup} = 2^{1/3} f_{inf} \Rightarrow \begin{cases} \Delta f = f_{sup} - f_{inf} = (2^{1/3} - 1) f_{inf} \\ f_c = \sqrt{f_{sup} \cdot f_{inf}} = 2^{1/6} f_{inf} \end{cases}$$

$$\Delta f / f_c = (2^{1/3} - 1) / 2^{1/6} \approx 0,232$$



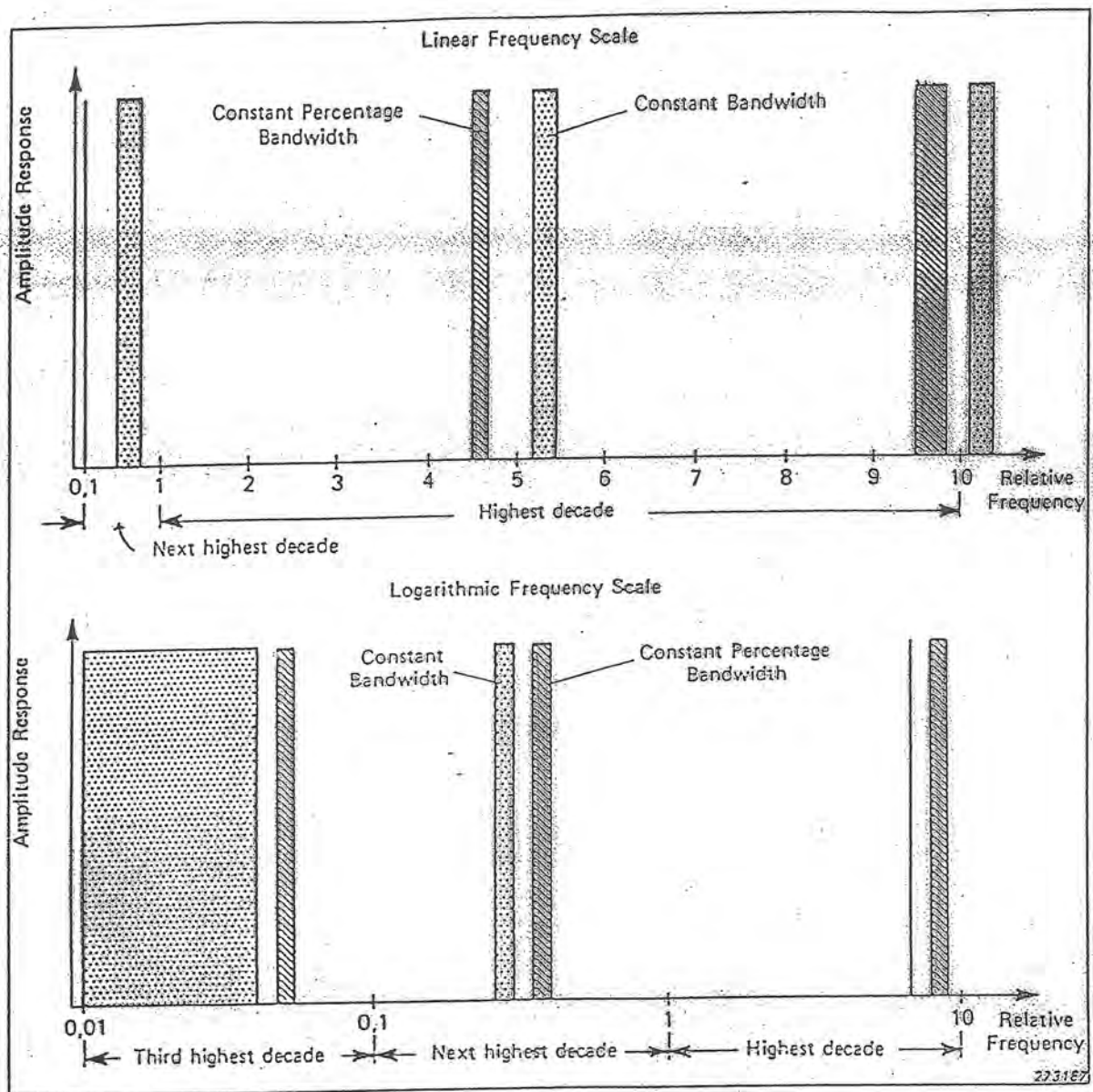


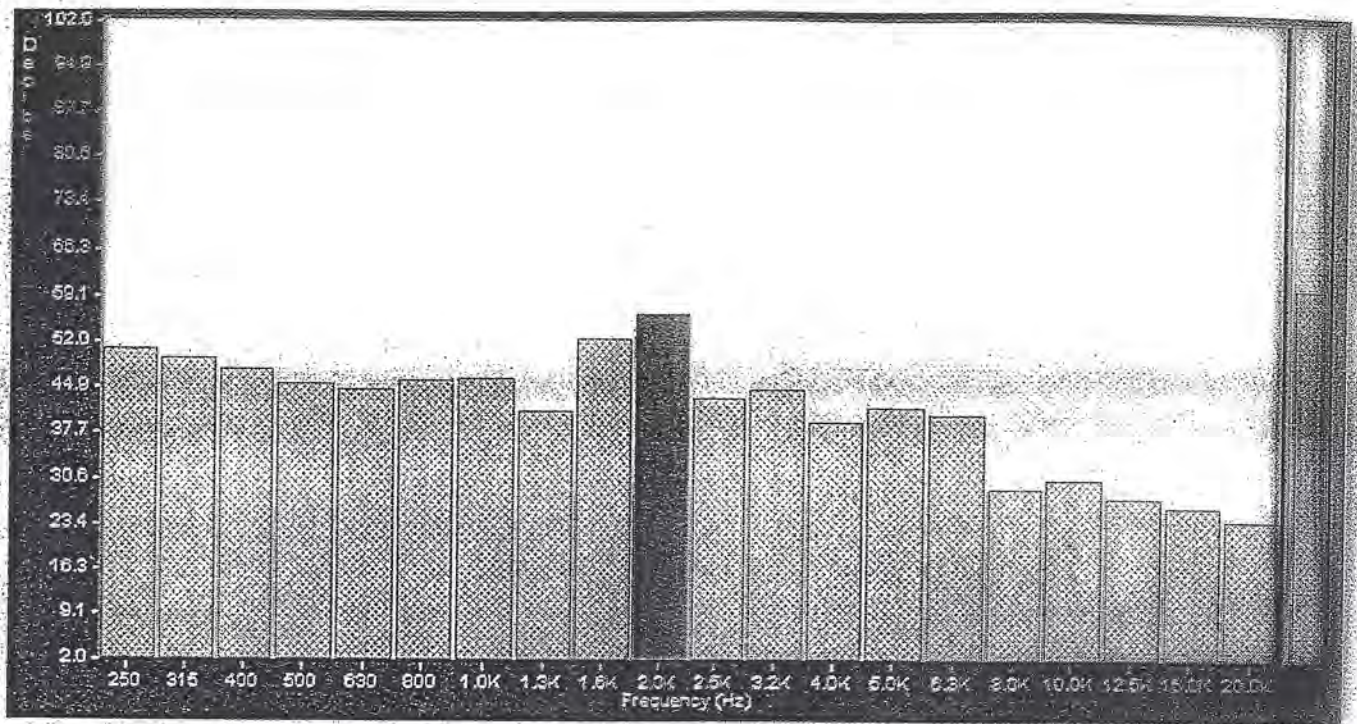
Fig.4.56. Difference between constant bandwidth and constant percentage bandwidth analysis

Bande ad ampiezza costante $\Delta f = \text{cost}$

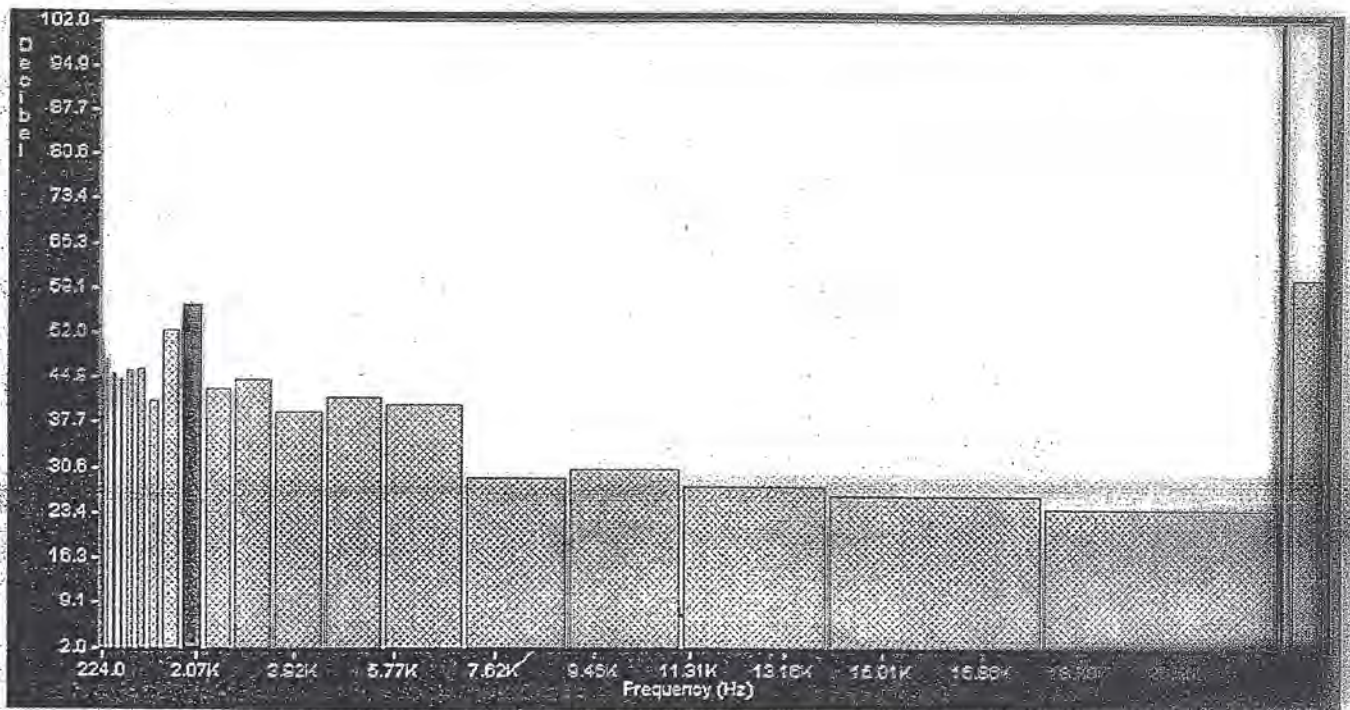
Bande ad ampiezza relativa costante $\frac{f_2 - f_1}{f_c} = \text{cost} \Rightarrow \lg f_2 - \lg f_1 = \text{cost}$
 con $f_c = \sqrt{f_1 f_2}$

Bande di 1/1 ottava			Bande di 1/3 ottava		
Frequenza limite inferiore	Frequenza di centro banda	Frequenza limite superiore	Frequenza limite inferiore	Frequenza di centro banda	Frequenza limite superiore
11	16	22	14,1	16	17,8
			17,8	20	22,4
			22,4	25	28,2
22	31,5	44	28,2	31,5	35,5
			35,5	40	44,7
			44,7	50	56,2
44	63	88	56,2	63	70,8
			70,8	80	89,1
			89,1	100	112
88	125	177	112	125	141
			141	160	178
			178	200	224
177	250	355	224	250	282
			282	315	355
			355	400	447
355	500	710	447	500	562
			562	630	708
			708	800	891
710	1000	1420	891	1000	1122
			1122	1250	1413
			1413	1600	1778
1420	2000	2840	1778	2000	2239
			2239	2500	2818
			2818	3150	3548
2840	4000	5680	3548	4000	4467
			4467	5000	5623
			5623	6300	7079
5680	8000	11360	7079	8000	8913
			8913	10000	11220
			11220	12500	14130
11360	16000	22720	14130	16000	17780
			17780	20000	22390

Limiti di banda e frequenze centrali per bande di 1/1 e 1/3 ottava in Hz.



Esempio di spettro sonoro in bande di 1/3 di ottava con scala logaritmica delle ascisse.



Esempio di spettro sonoro in bande di 1/3 di ottava con scala lineare delle ascisse.

