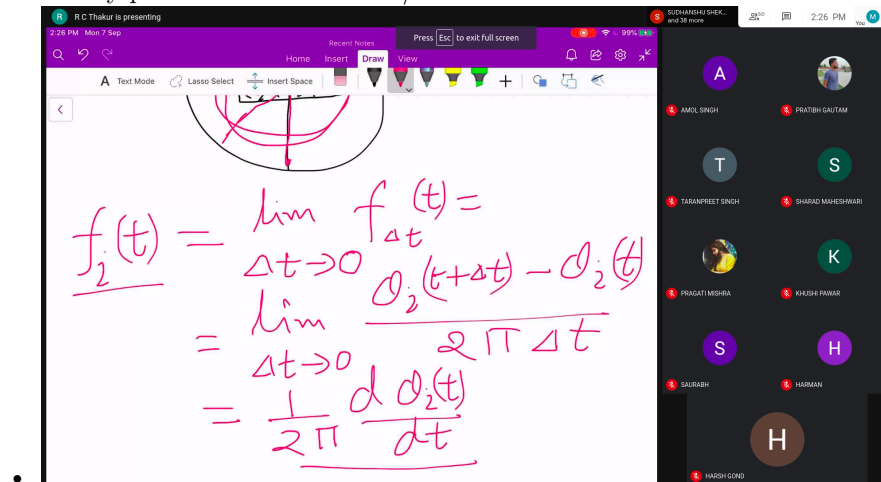


Angle Modulation

- Angle of carrier wave is carried in accordance with the modulating signal

Intro

- We say here that the general formula for the signal is $A \cos(\theta(t))$
- At any point the $\omega = d\theta / dt$



$$f_i(t) = \lim_{\Delta t \rightarrow 0} f_{\Delta t}(t) = \lim_{\Delta t \rightarrow 0} \frac{\theta_i(t+\Delta t) - \theta_i(t)}{2\pi \Delta t} = \frac{1}{2\pi} \frac{d\theta_i(t)}{dt}$$

- Hence **instantaneous frequency** is given by $f_i = d\theta / (2\pi \cdot dt)$
- Further you can write the equation as
 - $A \cos(2\pi \cdot f \cdot t + \theta_c)$
 - so we can vary frequency and θ_c
- So we have FM and PM (Phase modulation)

Phase Modulation

- $\phi_c = k_p \cdot m(t)$
- here the angle is varied linearly with $m(t)$
- so $\phi_i(t) = (2\pi \cdot f_c \cdot t) + (k_p \cdot m(t))$
- so the signal can be written as
 - $A_c \cos[(2\pi \cdot f_c \cdot t) + (K_p m(t))]$

Frequency Modulation

- $f_i(t)$ is varied according to modulating signal at $m(t)$

Activities | Brave Web Browser | Mon 16:43

Understanding Caplun... | Analog Communication S... | Data Scientist Interview... | Data Scientist Interview... | ADC 5th Semester for IC... | Meet - rpy-aviv... |

meet.google.com/rpy-aviv... |

Top | Treble | CP | Vim | ML | Interview Prep | PiBot | Robotics | Unix | Udemy | LeetCode | Internship | Research-NLP | College | GitHub | My Drive - Goo... | Classes | Other bookmarks

R C Thakur is presenting

8:41 PM Mon 7 Sep

modulating signal
 $m(t)$
 $f_i(t) = f_c + K_f m(t)$
 $\Delta f_c \propto m(t)$
 $= K_f m(t)$

ABHINAV and 38 more | 2:41 PM

GAURAV GUPTA | MUDIT KHANDELWAL
 ANUVESH SHARMA | MEDHAL JANGRA
 SHREYASH SHREEKANT | JAY SHARMA
 ANUSHKA SINGH | NAWNEET KUMAR
 PRADEEP GADGAM

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$= K_f m(t)$
 $f_i(t) = \frac{1}{2\pi} \frac{d\phi_i(t)}{dt}$
 $\phi_i(t) = 2\pi \int f_i(t) dt$

NEHA MOHIL and 38 more | 2:42 PM

GAURAV GUPTA | MUDIT KHANDELWAL
 ANUVESH SHARMA | MEDHAL JANGRA
 SHREYASH SHREEKANT | JAY SHARMA
 ANUSHKA SINGH | NAWNEET KUMAR
 PRADEEP GADGAM

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$2\pi \int dt$
 $= \int_0^T 2\pi f_i(t) dt$
 $= \int_0^T 2\pi [f_c + K_f m(t)] dt$

VAMSI PRASAD and 46 more | 2:44 PM

$$= \int_0^t 2\pi [f_c + K_f m(t)] dt$$

$$= 2\pi f_c t + \dots$$

$$= A_c \cos[2\pi f_c t + 2\pi K_f \int m(t) dt]$$

FM AND PM ARE RELATED

- If we inc the value of PM>360 , then freq will inc.