lab report 10

19L-1316

FOURIER SYNTHESIS OF PERIODIC SIGNALS

OBJECTIVE:

Design an experiment to perform Fourier synthesis of a periodic signal

given the Fourier coefficients.

INTRODUCTION:

A periodic signal, (��), can be reconstructed from sine and cosine waves

with frequencies that are multiples of the fundamental frequency, ����. The ����

and �� co-efficients hold the amplitudes of cosine and sine waves

respectively.

Therefore, any periodic signal is a sum of discrete frequency sinusoidal

components. We can also represent (��) using a sum of harmonically related

complex exponential signals������������.

A periodic signal (��)with a period �� can be expressed as a sum of a

sinusoid of frequency �� and its entire harmonics, as shown in equation

below:

��(��) = ���� + ∑ (������������������ + ������������������)

= �� + ∑����������(���� + �� )

Where

�� = ����

�� = √(���� + ����^��)

�� = ������−� ( −�� / �� )

Trigonometric Fourier series coefficients can be computed using

following formulas.

�� = (� / ��� ∫ ��(��) ����

�� = (� / ��� ∫ ��(��) ������������������

���� = (�� / ����) ∫ (��) ����������������t

ISSUES:-

There were no issues while doing the lab.

CONCLUSION:-

The purpose of this experiment is design an experiment to perform

Fourier synthesis of a periodic signal given the Fourier coefficients.

POST LAB:-

4.1:

X(t)= [((4. /((n.^2). \*(pi^2))). \*sin((n.\*pi). /2)) -((2. /(n.\*pi)). \*cos((n.\*pi). /2))]

\*(sin(2\*pi\*n\*t))

4.2:

INPUT PARAMETERES:

→a0

→an

→bn

→N

→wo

→t

