DEPARTMENT OF ELECTRICAL ENGINEERING

DELHI TECHNOLOGICAL UNIVERSITY

(Formerly Delhi College of Engineering)

Bawana Road, Delhi-110042

CERTIFICATE

This is to certify that the Project entitled **"Voltage Differencing Current Conveyor and Its Application in Analog Signal Processing"** submitted by **Ashok Kumar Kumawat** in completion of major project dissertation for Master of Technology degree in **Control and Instrumentation** at Delhi Technological University is an authentic work carried out by him under my supervision and guidance.

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Place: Delhi

Date: 14.07.2014

(PROF. PRAGATI KUMAR)

Professor

Department of Electrical Engineering

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ABSTRACT

Ever since the introduction of current conveyors as basic building block in analog signal processing many other active building blocks have been introduced in literature. This has become possible because of the developments in the semiconductor manufacturing technologies (both bipolar as well as CMOS). During the last two decades various modifications have been done in the architecture of the current conveyor and many derivatives of this block have appeared in the literature. Voltage differencing current conveyor (VDCC) combines the features of a current conveyor and a transconductance amplifier. Voltage differencing current conveyor can be used to perform all the regular signal processing functions (summation, differencing, scalar multiplication, immittance simulation etc.). The present works deals with these signal processing applications of the voltage differencing current conveyor. After presenting an overview of the various constitutive circuits used in modern active building blocks, the applications of VDCC in analog signal processing has been presented. A novel multifunction filter with tunability properties similar to the KHN biquad has also been proposed. All the circuits presented in the dissertation have been simulated in PSPICE.

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LIST OF SYMBOLS, ABBREVIATIONS

S.No.	Symbols	Descriptions
1.	g_m	Transconductance
2.	Z_i	Input Impedance
3.	Z_o	Output Impedance
4.	V_{SS}	Source Supply Voltage
5.	V_{DD}	Drain Supply Voltage
6.	I_o	Bias Current
7.	I_b	Bias Current
8.	VDCC	Voltage Differencing Current Conveyor
9.	OTA	Operational Transconductance Amplifier
10.	CC	Current Conveyor
11.	CFA	Current Feedback Amplifier
12.	CFOA	Current Feedback Operational Amplifier
13.	CDBA	Current Differencing Buffer Amplifier
14.	VDBA	Voltage Differencing Buffered Amplifier
15.	CMOS	Complementary Metal Oxide Semiconductor
16.	OA	Operational Amplifier
17.	ASP	Analog Signal Processing
18.	CDTA	Current Differencing Transconductance Amplifier
19.	VCO	Voltage Controlled Oscillators
20.	UCC	Universal Current Conveyor
21.	VCVS	Voltage Controlled Voltage Source