Amplifier for Offset Cancellation (#3492)

A long-term offset cancellation scheme that enables continuous time amplifier operations

Georgia Tech inventors have created a long-term offset cancellation scheme that enables continuous time amplifier operations. Offset cancellation is achieved by programming floating-gate transistors that form an integral part of the amplifier's architecture. The offset voltage of a single-stage folded cascade amplifier is reduced in a digital CMOS process. This invention is an operational amplifier including: a differential pair of transistors coupled to a pair of input signals; and a pair of floating-gate transistors coupled to the differential pair of transistors, wherein the pair of floating-gate transistors are operable for reducing an offset voltage of the operational amplifier.

Benefits/Advantages

- Better voltage offset
- Cheaper

Potential Commercial Applications

- Electronic devices
- Consumer, industrial, and scientific devices

Background/Context for This Invention

An operational amplifier, usually referred to as an 'op-amp', is a DC-coupled high-gain electronic voltage amplifier with differential inputs and, usually, a single output. In its ordinary usage, the output of the op-amp is controlled by negative feedback which, because of the amplifier's high gain, almost completely determines the output voltage for any given input. Op-amps are among the most widely used electronic devices today, being utilized in a vast array of consumer, industrial, and scientific devices. A practical concern for op-amp performance is voltage offset. Operational amplifiers are differential amplifiers which are designed to amplify the difference in voltage between the two input connections and nothing more. In an ideal situation, when that input voltage difference is exactly zero volts, zero volts are expected to be present on the output. However, in the real world the ideal case rarely happens, even if the op-amp in question has zero common-mode gain, the output voltage may not be at zero when both inputs are shorted together.

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Patent/IP Information

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Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/amplifier-offset-cancellation