ABSTRACT

ADAPTIVE NOISE SHAPING IN OVERSAMPLED ADC
BASED ON LMS ALGORITHM (October 2000)

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A novel technique for achieving noise shaping in oversampled converters is proposed. The technique proposed in this dissertation leads to an architecture that is similar to a sigma-delta structure. But it is based on different basic idea. I move from the LMS algorithm and have adapted the resulting signal processing diagram to achieve a circuit that can be implemented with conventional analog basic blocks. The circuit implementation looks like a sigma-delta modulator and requires limited additional circuits for the necessary multipliers. The fully differential switched capacitor circuitry is employed for the implementation of the proposed modulator. The nonidealities coming from the basic building blocks are examined in SIMULINK. Based on the behavioral simulation results, all specifications of the building blocks are chosen. Simulation results, confirmed by experimental measurements, show that more than 15 *d*B in the SNR are gained with respect to an equivalent sigma-delta counterpart in the low signal level range.