CONCLUSIONS

In this work, digitally programmable switched-current circuits suitable for low-voltage applications have been proposed. The switches operate at constant voltage avoiding both the “conduction gap” and the signal-dependent charge injection. The programmability of the filters is achieved using the MOSFET only current divider (MOCD). The MOCD’s occupy small areas as compared to the conventional SI binary weighted transistors and the capacitor arrays in the SC technique.

A programmable second order section has been implemented. The center frequency and the quality factor of the SI biquad section can be controlled independently.

A programmable SI sample-hold circuit has been designed for 20 MHz sampling frequency applications. A programmable 4-tap FIR filter has been designed and integrated. The circulating technique has been employed for the FIR realization to reduce the offset and re-sampling error accumulation. The test chip has been fabricated in the double-poly double-metal 0.8μm CMOS process from AMS with silicon area 4.0mm^2 and total power 60mW from ± 1.5 power supply.

Also, a fully balanced (FB) programmable switched-current sample-hold circuit has been proposed and integrated for 20 MHz clock frequency. Furthermore, a new methodology for negative sign-bit realization has been proposed and tested. A complete fully balanced SI tap has been designed. The circuit occupies 0.8mm^2 die area. A programmable 8-tap fully balanced FIR filter has been designed using the proposed FB S/H circuit.