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Fractional Order Sallen-Key Filters

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Abstract : This work aims to generalize the integer order Sallen-Key filters into the fractional-order domain. The analysis in the case of two different fractional-order elements introduced where the general transfer function becomes four terms which are unusual in the conventional case. In addition, the effect of the transfer function parameters on the filter poles and hence the stability is introduced and closed forms for the filter critical frequencies are driven. Finally, different examples of the fractional order Sallen-Key filter design are presented with circuit simulations using ADS where a great matching between the numerical and simulation results is obtained.

Keywords : Sallen-Key, fractance, stability, low-pass filter, analog filter
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