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One Period Loops of Memristive Circuits with Mixed-Mode Oscillations

Authors : Wieslaw Marszalek, Zdzislaw Trzaska

Abstract : Interesting properties of various one-period loops of singularly perturbed memristive circuits with mixed-mode oscillations (MMOs) are analyzed in this paper. The analysis is mixed, both analytical and numerical and focused on the properties of pinched hysteresis of the memristive element and other one-period loops formed by pairs of time-series solutions for various circuits' variables. The memristive element is the only nonlinear element in the two circuits. A theorem on periods of mixed-mode oscillations of the circuits is formulated and proved. Replacements of memristors by parallel G-C or series R-L circuits for a MMO response with equivalent RMS values is also discussed.

Keywords : mixed-mode oscillations, memristive circuits, pinched hysteresis, one-period loops, singularly perturbed circuits
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