



Amplitude and Frequency Control: Stability of Limit Cycles in Phase-Shift and Twin-T Oscillators

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We show a technique for external direct current (DC) control of the amplitudes of limit cycles both in the Phase-shift and Twin-T oscillators. We have found that amplitudes of the oscillator output voltage depend on the DC control voltage. By varying the total impedance of each oscillator oscillatory network, frequencies of oscillations are controlled using potentiometers. The main advantage of the proposed circuit is that both the amplitude and frequency of the waveforms generated can be independently controlled. Analytical, numerical, and experimental methods are used to determine the boundaries of the states of the oscillators. Equilibrium points, stable limit cycles, and divergent states are found. Analytical results are compared with the numerical and experimental solutions, and a good agreement is obtained.

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