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Section:

9. Ordinary Differential Equations and Dynamical Systems

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Conditions for existing of cycles in some two-dimensional system of differential equations

We consider two-dimensional system of ordinary differential equations

$$\frac{dx}{dt} = \alpha[y - \delta x + f(x)], \quad \frac{dy}{dt} = x - y + z,$$

with piece-wise linear right side $f(x) = x - \frac{1}{2}\left(|x+1| - |x-1|\right)$.
This system describes the behavior of Chua's electronic circuit under appropriate conditions on it's elements. The coefficient criteria for existing of cycles will be presented.