We consider a planar non-smooth system of the form

\[ \dot{x} = f(x, y), \quad \dot{y} = g(x, y), \quad x \neq 0, \]

where

\[ (f(x, y), g(x, y)) = \begin{cases} (f^+(x, y), g^+(x, y)), & x > 0, \\ (f^-(x, y), g^-(x, y)), & x < 0, \end{cases} \]

and \( f^\pm(x, y), g^\pm(x, y) \) are supposed to be \( C^\omega \) functions. Then the two \( C^\omega \) systems

\[ \dot{x} = f^+(x, y), \quad \dot{y} = g^+(x, y), \quad x > 0, \]

and

\[ \dot{x} = f^-(x, y), \quad \dot{y} = g^-(x, y), \quad x < 0, \]

are called the right and the left subsystem resp.. The flow \( \varphi(t, A) \) of the full system can be defined by using the flows \( \varphi^\pm(t, A) \) of the right subsystem and the left subsystem.

If

\[ f(x, y) = H_y, \quad g(x, y) = -H_x, \quad x \neq 0, \]

where

\[ H(x, y) = \begin{cases} H^+(x, y), & x > 0, \\ H^-(x, y), & x < 0, \end{cases} \]
and $H^\pm(x, y) \in C^\omega$ with $H^\pm(0, 0) = 0$, then it is called a piecewise Hamiltonian system.

We will introduce some recent studies on the limit cycle bifurcations for planar non-smooth systems, including piecewise Hamiltonian systems and near-Hamiltonian systems. (Received September 01, 2010)