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Claudio Pessoa* (pessoa@ibilce.unesp.br), S. J. Rio Preto, SP 15054-000, Brazil, and **Jorge Sotomayor** (sotp@ime.usp.br), São Paulo, SP 05508-090, Brazil. *Structurally stable piecewise smooth polynomial vector fields.*

Consider in \mathbb{R}^2 the semi-planes $N = \{y > 0\}$ and $S = \{y < 0\}$ having as common boundary the straight line $D = \{y = 0\}$. In N and S are defined polynomial vector fields X and Y , respectively, leading to a discontinuous polynomial vector field $Z = (X, Y)$. This work pursues the stability and transition analysis of solutions of Z between N and S , started by Filippov (1988) and Kozlova (1984) and reformulated by Sotomayor–Teixeira (1995) in terms of the regularization method. This method consists in to analyze a one parameter family of continuous vector fields Z_ϵ , defined by averaging X and Y . This family approaches Z when the parameter goes to zero. The results of Sotomayor–Teixeira and Sotomayor–Machado (2002) providing conditions on (X, Y) for the regularized vector fields to be structurally stable and generic in planar compact connected regions are extended for discontinuous polynomial vector fields on \mathbb{R}^2 . A procedure for study discontinuous vector fields at infinity through compactification is proposed here. (Received May 08, 2013)