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The geometric approach to global stability: general remarks and applications to epidemic models

A generalization of the Bendixson criterion is used to completely determine the dynamics - including thresholds and global stability of the non trivial equilibrium - of a general ODEs system with SEIR-like structure. Sufficient conditions are in fact provided, expressed in terms of the parameters of the system, ensuring that the geometric approach to global stability analysis, due to M. Li and J. Muldowney [SIAM J. Math. Appl., 27 (1996)], may be successfully applied. The result is applied to several well known epidemic models, including an epidemic model with information dependent vaccination. More complex nonlinearities are also considered as the case of a convex force of infection.

This is a joint work with Bruno Buonomo from Department of Mathematics, University of Naples Federico II.

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