Centro de Investigação em Matemática e Aplicações
Departamento de Matemática
Programa de Doutoramento em Matemática

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First-order non-linear coupled systems -
- Existence and localization of periodic solutions

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Abstract: We present some existence and localization results for periodic solutions of first-order coupled non-linear systems of two equations, with and without impulses, without requiring periodicity for the non-linearities. The arguments are based on Schauder's Fixed Point Theorem together with the upper and lower solution method, where the upper and lower solutions are not necessarily well-ordered. In addition, results on equi-regulated functions are required for the impulsive analysis. To test our results to a real-case scenario, we apply our results to a Wilson- Cowan system of two strongly coupled neurons.