Boundary value problems for ordinary differential systems with generalized variable exponents operators

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In recent years an increasing interest in more general operators generated by Musielak-Orlicz functions is under development since they provide, in principle, a unified treatment to deal with ordinary and partial differential equations with operators containing the p-Laplacian, the ϕ-Laplacian, operators with variable exponents and the double phase operators.

These kind of considerations lead to consider quasilinear problems containing operators of the type $(\mathcal{S}(t, u'))'$, and look for nonlinear systems of ordinary differential equations of the form

$$(\mathcal{S}(t, u'))' = f(t, u, u')$$

submitted to various two-point boundary conditions.

Our approach consists to work in C^1 spaces to obtain suitable abstract fixed point and continuation theorems, from which several applications are obtained, including problems of Liénard and Hartman type.

This is a joint work with M. Garcia-Huidobro, R. Manásevich and S. Tanaka.