

© 2017 Heldermann Verlag  
Minimax Theory and its Applications 02 (2017) 069–078

**P. Jebelean**

Dept. of Mathematics, West University of Timisoara, 4 Blvd. V. Pârvan, 300223 Timisoara,  
Romania  
petru.jebelean@e-uvt.ro

**J. Mawhin**

Dép. de Mathématique, Université Catholique de Louvain, 2 Chemin du Cyclotron, 1348  
Louvain-la-Neuve, Belgique  
jean.mawhin@uclouvain.be

**C. Şerban**

Dept. of Mathematics, West University of Timisoara, 4 Blvd. V. Pârvan, 300223 Timisoara,  
Romania  
cserban2005@yahoo.com

**Multiplicity Results for some Quasilinear Differential Systems with  
Periodic Nonlinearities**

A multiplicity result for periodic problems of the form

$$-(\psi(u'))' = \nabla_u V(t, u) + e(t), \quad u(0) = u(T), \quad u'(0) = u'(T),$$

when  $\psi : \mathbb{R}^N \rightarrow \mathbb{R}^N$  belongs to a suitable class of homeomorphisms,  $V$  is  $T_i$ -periodic in each component  $u_i$  of  $u \in \mathbb{R}^N$ , and  $e$  has mean value zero on  $[0, T]$  is proved, and applied, by a modification technique, to obtain the same multiplicity for the solutions of the relativistic system

$$-\left(\frac{u'}{\sqrt{1-|u'|^2}}\right)' = \nabla_u V(t, u) + e(t), \quad u(0) = u(T), \quad u'(0) = u'(T).$$

**Keywords:** Periodic solutions, periodic nonlinearities, relativistic pendulum systems.

**MSC:** 34C25; 35J25, 35J65