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**Kanishka S. Perera\*** ([kperera@fit.edu](mailto:kperera@fit.edu)), Department of Mathematical Sciences, Florida Institute of Technology, 150 West University Blvd., Melbourne, FL 32901-6975. *Nontrivial Critical Groups in  $p$ -Laplacian Problems via the Cohomological Index.*

We construct and variationally characterize by a min-max procedure involving the Cohomological index a new sequence of eigenvalues of the  $p$ -Laplacian, and use the structure provided by this sequence to show that the associated variational functional always has a nontrivial critical group. As an application we obtain nontrivial solutions for a class of  $p$ -superlinear problems. (Received August 13, 2006)