THE EXISTENCE OF SOLUTIONS OF THE DISCRETE p-LAPLACIAN EQUATIONS WITH NONLINEAR SOURCE TERMS

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Abstract: In this talk, we deal with the p-Laplacian equation on a finite network $S \cup \partial S$ as follows:

$$-\Delta_p u(x) + V(x)|u(x)|^{p-2}u(x) = f(x, u(x)), \quad \text{for all } x \in S, \ u = 0 \text{ on } \partial S,$$

where $1 < p < \infty$ and V is a real-valued function defined on S. The main goal is to verify the existence of multiple positive solutions of the equation. To do so, we discuss some analogues such as the comparison principle, the method of subsolutions and supersolutions, the Palais-Smale compactness conditions and others.