Some existence results of positive solutions for φ-Laplacian systems

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We consider the existence of positive solutions for the following φ-Laplacian systems;

$$\begin{cases} -\Phi(u')' = h(t) \cdot f(u), & t \in (0,1), \\ u(0) = 0 = u(1), \end{cases} \qquad (P)$$

where $\Phi(u') = (\varphi(u_1'), \cdots, \varphi(u_N'))$ with $\varphi : \mathbb{R} \to \mathbb{R}$ an odd increasing homeomorphism, $h : (0,1) \to \mathbb{R}^N$ may be singular at 0 or/and 1 so that h may not be in $L^1(0,1)$. $f \in C(\mathbb{R}^N, \mathbb{R}^N)$ and $x \cdot y := (x_1 y_1, x_2 y_2, \cdots, x_N y_N)$.

Study of generalized Laplacian problems like (P) with coefficient functions not in L^1 is very rare and even corresponding integral operator is not known yet.

In this talk, under suitable assumptions on φ and h, we drive a new integral operator for problem (P). After proving compactness of the operator, we introduce several existence results of positive solutions for problem (P).