

# Existence and uniqueness results for $p(x)$ -Laplacian with degeneracy

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In this talk, we study the degenerate elliptic equation with a variable exponent subject to Dirichlet boundary condition

$$-\operatorname{div}(w(x)|\nabla u|^{p(x)-2}\nabla u) = f(x, u) \quad \text{in } \Omega$$

where  $\Omega$  is a bounded domain in  $\mathbb{R}^N$  with Lipschitz boundary  $\partial\Omega$ , the variable exponent  $p : \bar{\Omega} \rightarrow (1, \infty)$  is a continuous function,  $w$  is a weighted function in  $\Omega$  and  $f : \Omega \times \mathbb{R} \rightarrow \mathbb{R}$  satisfies a Carathéodory condition. With or without Ambrosetti-Rabinowitz condition, we obtain the existence results. Assuming nonincreasing condition for  $f$  in  $u$  and applying the suitable imbedding and a priori bound, we get the uniqueness results. This is based on joint works with Yun-Ho Kim and Ky Ho.