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IMPLICIT INTEGRAL EQUATIONS WITH DISCONTINUOUS NONLINEARITIES

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ABSTRACT. In this paper we establish the existence of at least one solution for a class of implicit integral equations with possibly discontinuous nonlinearities, which includes the well-known Chandrasekhar equation, among others. Our approach fully depends on a very recent result on fixed points for increasing, not necessarily continuous, operators in ordered Banach space due to Bonanno and Marano; see Theorem 1 below.

Very recently, in [**6**], the following fixed point result has been established; see [**6**, Theorem 2.1].

Theorem 1. *Let* $(E, \|\cdot\|, K)$ *be an ordered Banach space with a regular cone* K*, let* $[a, b]$ *be an order interval in* E*, and let* $F : [a, b] \to [a, b]$ *be an increasing function. Then:*

A1) *The function* F *has a minimal fixed point* v_* *and a maximal fixed point* v^*.

A2) $v_* = \min\{v \in [a, b] : v \leq F(v)\}$ *while* $v^* = \max\{v \in [a, b] : F(v) \leq v\}$.

A3) *For continuous* F *one has* $v_* = \lim_{n\to\infty} F^n(a)$ *as well as* $v^* = \lim_{n\to\infty} F^n(b)$.

As pointed out in [**6**], due to the monotone convergence theorem, a natural framework where the above result applies successfully is given by usual Lebesgue spaces $(L^p(\Omega), \|\cdot\|_p)$, $1 \leq p < +\infty$, equipped with the positive cone

$$K_p := \{u \in L^p(\Omega) : u(t) \geq 0 \quad \text{a.e. in } \Omega\}. \tag{1}$$

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