INFINITELY MANY SOLUTIONS
FOR A CLASS OF CRITICAL CHOQUARD EQUATION
WITH ZERO MASS

FASHUN GAO — MINBO YANG
CARLOS ALBERTO SANTOS — JIAZHENZ ZHOU

ABSTRACT. In this paper we investigate the following nonlinear Choquard equation

$$-\Delta u - \left( \int_{\mathbb{R}^N} \frac{G(y, u)}{|x-y|^p} dy \right) g(x, u) \quad \text{in} \, \mathbb{R}^N,$$

where $0 < \mu < N$, $N \geq 3$, $g(x, u)$ is of critical growth in the sense of the Hardy–Littlewood–Sobolev inequality  and $G(x, u) = \int_0^u g(x, s) ds$. By applying minimax procedure and perturbation technique, we obtain the existence of infinitely many solutions.

1. Introduction and main results

The aim of the present paper is to consider the following nonlinear critical Choquard equation with a subcritical nonlocal term

$$
\begin{cases}
-\Delta u - \left( \int_{\mathbb{R}^N} \delta |u(y)|^{2^*-2} + \lambda K(y) |u(y)|^p \frac{dy}{|x-y|^p} \right) g(x, u) \\
\delta |u(y)|^{2^*-2} u + \frac{p}{2} \lambda K(y) |u(y)|^{p-2} u \\
u \in D^{1,2}(\mathbb{R}^N),
\end{cases}
$$

(1.1)

2010 Mathematics Subject Classification. 35J20, 35J60, 35A15.
Key words and phrases. Critical Choquard equation; Hardy–Littlewood–Sobolev inequality; infinitely many solutions.

Minbo Yang is the corresponding author who was partially supported by NSFC (11571317).