Topological **M**ethods in **N**onlinear **A**nalysis
Volume 56, No. 1, 2020, 1–30
DOI: 10.12775/TMNA.2019.110

CORRIGENDUM AND ADDENDUM TO "NON-AUTONOMOUS QUASILINEAR ELLIPTIC EQUATIONS AND WAŻEWSKI'S PRINCIPLE"

Matteo Franca

Abstract. In this addendum we fill a gap in a proof and we correct some results appearing in [12]. In the original paper [12] we classified positive solutions for the following equation

$$\Delta_p u + K(r)u^{\sigma-1} = 0$$

where $r = |x|$, $x \in \mathbb{R}^n$, $n > p > 1$, $\sigma = np/(n-p)$ and $K(r)$ is a function strictly positive and bounded. In fact [12] had two main purposes. First, to establish asymptotic conditions which are sufficient for the existence of ground states with fast decay and to classify regular and singular solutions: these results are correct but need some non-trivial further explanations. Second to establish some computable conditions on K which are sufficient to obtain multiplicity of ground states with fast decay in a non-perturbation context. Also in this case the original argument contained a flaw: here we correct the assumptions of [12] by performing a new nontrivial construction. A third purpose of this addendum is to generalize results of [12] to a slightly more general equation

$$\Delta_p u + r^\delta K(r)u^{\sigma(\delta)-1} = 0$$

where $\delta > -p$, and $\sigma(\delta) = p(n+\delta)/(n-p)$.

2020 *Mathematics Subject Classification.* Primary: 35J92, 37D10; Secondary: 34C37, 34C45.

Key words and phrases. p-Laplace equations; invariant manifold; non-smooth systems; radial solutions; ground states; Fowler transformation; Ważewski's principle.

Partially supported by the GNAMPA project "*Sistemi dinamici, metodi topologici e applicazioni all'analisi nonlineare*".