

ON SOME SCALAR FIELD EQUATION

GIOVANNA CERAMI *

The nonlinear scalar field equation

$$(P) \quad \begin{cases} -\Delta u + a(x)u = |u|^{p-1}u & \text{in } \mathbb{R}^N \\ u(x) \rightarrow 0 & \text{as } |x| \rightarrow +\infty \end{cases}$$

where $N \geq 2$, $p > 1$, $p < 2^* - 1 = \frac{N+2}{N-2}$, if $N \geq 3$, is considered.

Assuming that the potential $a(x)$ is a positive function which approaches from above its limit at infinity, $a_\infty > 0$, and satisfies slow decay assumptions, but that is not required to enjoy symmetry, we discuss the existence of a positive solution to (P) having infinitely many 'bumps', that rarefy when the distance from the origin increases, and the existence of infinitely many nodal solutions.

*Dipartimento di Matematica, Politecnico di Bari, Bari, Italia, email: cerami@poliba.it