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A topological technique for reducing the dimension of a class of nonlinear equations

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Abstract - It is given an approximative method for solving nonlinear equations in n-dimensional spaces. In fact, it is developed an original tehnique for reducing the number of unknowns of the equation, using the geometric interpretation of the topological index of Poincaré. The main result is established in case $n = 2$ where consider a continuous vector field $F \in C(\overline{D})$ with $0 \notin F(\partial D)$. If for some $a \in \partial D$, the equation $F(x) = F(a)$ has an odd number of solutions $x \in \partial D$, then the equation $F(x) = 0$ has at least one solution in D. Finally, a numerical example is given.

Key words and phrases : nonlinear equations, continuous deformation, topological degree

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