

## Accepted Manuscript

Starting points for Newton's method under a center Lipschitz condition for the second derivative

J.A. Ezquerro, M.A. Hernández-Verón, Á.A. Magreñán

PII: S0377-0427(16)30623-9

DOI: <http://dx.doi.org/10.1016/j.cam.2016.12.013>

Reference: CAM 10937

To appear in: *Journal of Computational and Applied Mathematics*

Received date: 12 September 2016

Revised date: 21 November 2016

Please cite this article as: J.A. Ezquerro, M.A. Hernández-Verón, .A. Magreñán, Starting points for Newton's method under a center Lipschitz condition for the second derivative, *Journal of Computational and Applied Mathematics* (2016), <http://dx.doi.org/10.1016/j.cam.2016.12.013>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Starting points for Newton's method under a center Lipschitz condition for the second derivative

J. A. Ezquerro <sup>a</sup>, M. A. Hernández-Verón <sup>a</sup> and Á. A. Magreñán <sup>b</sup>

<sup>a</sup> *Department of Mathematics and Computation, University of La Rioja.*

*Calle Luis de Ulloa s/n, 26004 Logroño, Spain.*

E-mail address: <jezquer><mahernan>@unirioja.es

<sup>b</sup> *Escuela Superior de Ingeniería y Tecnología, Universidad Internacional de La Rioja.*

*Avenida Gran Vía Rey Juan Carlos I, 41, 26002 Logroño, Spain.*

E-mail address: alberto.magrenan@unir.net

## Abstract

We analyse the semilocal convergence of Newton's method under a center Lipschitz condition for the second derivative of the operator involved different from that used by other authors until now. In particular, we propose to center the Lipschitz condition for the second derivative in a different point from that where Newton's method starts. This allows us to obtain different starting points for Newton's method and modify the domain of starting points.

**Keywords:** Newton's method, semilocal convergence, majorizing sequence, error estimates, order of convergence, region of accessibility, integral equation.

**2000 Mathematics Subject Classification:** 47H99, 65H10, 65J15.

This work has been partially supported by the project MTM2014-52016-C2-1-P of Spanish Ministry of Economy and Competitiveness and the International University of La Rioja, under the Plan Propio de Investigación, Desarrollo e Innovación (2015–2017, research group: Modelación matemática aplicada a la ingeniería (MOMAIN) and the grant SENECA 19374/PI/14.

## 1 Introduction

By using mathematical modelling, many problems from computational sciences and other disciplines can be brought in the form of the equation  $F(x) = 0$ , where  $F$  is a nonlinear

Download English Version:

<https://daneshyari.com/en/article/8902220>

Download Persian Version:

<https://daneshyari.com/article/8902220>

[Daneshyari.com](https://daneshyari.com)