

## Accepted Manuscript

Backward stability with almost strictly sign regular matrices

P. Alonso, J.M. Peña, M.L. Serrano

PII: S0377-0427(17)30132-2

DOI: <http://dx.doi.org/10.1016/j.cam.2017.03.013>

Reference: CAM 11060

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

Received date: 3 June 2016

Revised date: 11 January 2017

Please cite this article as: P. Alonso, J.M. Peña, M.L. Serrano, Backward stability with almost strictly sign regular matrices, *Journal of Computational and Applied Mathematics* (2017), <http://dx.doi.org/10.1016/j.cam.2017.03.013>

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.



# Backward stability with almost strictly sign regular matrices

P. Alonso<sup>a</sup>, J.M. Peña<sup>b</sup>, M.L. Serrano<sup>a</sup>

<sup>a</sup>*Departamento de Matemáticas, Universidad de Oviedo, Spain*

<sup>b</sup>*Departamento de Matemática Aplicada, Universidad de Zaragoza, Spain*

---

## Abstract

A sign regular matrix is almost strictly sign regular if all its nontrivial minors of the same order have the same strict sign. These matrices form a subclass of sign regular matrices (matrices whose minors of the same order have the same sign). In this paper, the backward stability for almost strictly sign regular matrices is studied when Neville elimination with two-determinant pivoting strategy is applied. In addition, several numerical experiments are also presented.

*Keywords:* sign regular matrices, almost strictly sign regular matrices, backward stability, backward error

*2000 MSC:* 65F05, 65F15, 65F35

---

## 1. Introduction

Error analysis of Gauss elimination is a subject that became firmly established fifty years ago due specially to Wilkinson's work (see [17] and [18]). Let us assume that  $Ax = b$  is a linear system where  $A = LU$  ( $L$  and  $U$  are lower and upper triangular matrices respectively) is a nonsingular matrix and that Gauss elimination applied to  $A$  in floating point arithmetic has produced a factorization  $\widehat{L}\widehat{U}$  and a solution  $\widehat{x}$ .

To investigate the effect of rounding errors when working with floating

---

*Email addresses:* palonso@uniovi.es (P. Alonso), jmpena@unizar.es (J.M. Peña), mlserrano@uniovi.es (M.L. Serrano)

Download English Version:

<https://daneshyari.com/en/article/5776239>

Download Persian Version:

<https://daneshyari.com/article/5776239>

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