

46<sup>th</sup> Annual Iranian Mathematics Conference 25-28 August 2015 Yazd University



A reliable algorithm based on the Sumudu transform for solving partial  $\dots$  pp.: 1–4

## A reliable algorithm based on the Sumudu transform for solving partial differential equations

Mohsen Riahi<sup>\*</sup> Shiraz University of Technology Esmail Hesameddini Shiraz University of Technology

Mehdi Shahbazi Shiraz University of Technology

## Abstract

In this paper, a new combination of the Adomian decomposition method and the Sumudu transform (ADST) is introduced for solving nonlinear partial differential equations (PDEs). The main objective of this paper is to present a reliable approach to compute an approximate solution of PDEs.

Keywords: Sumudu transform, Adomian decomposition method Mathematics Subject Classification [2010]: 65Mxx, 34A34

## 1 Introduction

Nonlinear partial differential equations are widely used to describe complex phenomena in many fields of applied sciences, such as chemistry, physics, fluid dynamics, plasma physics, hydrodynamics and engineering disciplines. The application of the Adomian decomposition method (ADM) [1], in nonlinear problems has been used by scientists and engineers, since this method continuously deform the under study nonlinear equation into a simple problem which is easy to solve. In recent years, Wazwaz etc., [2], improved the ADM and expanded fields of its application. Recently, Watugala introduced a new transform and named it as Sumudu transform. This transform is used to find the solution of ordinary differential equations and control engineering problems, [3]. Very recently, Singh et al. [4], have proposed a new approach named homotopy perturbation Sumudu transform method (HPSTM) to solve the nonlinear partial differential equations. The homotopy perturbation Sumudu transform method (HPSTM) is a combination of Sumudu transform method, HPM and Hes polynomials and is mainly due to Ghorbani [5] Singh and Shishodia [6]. The basic motivation of this paper is to propose a new modification of ADM and Sumudu transform algorithm. By using this new method, which is a combination of the Adomian decomposition method and Sumudu transform ADST, all conditions will be satisfied.

<sup>\*</sup>Speaker