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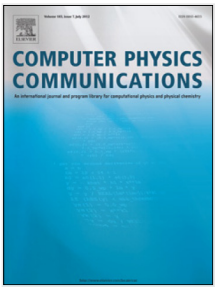

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PII: S0010-4655(16)30397-6
DOI: http://dx.doi.org/10.1016/j.cpc.2016.12.018
Reference: COMPHY 6117

To appear in: *Computer Physics Communications*

Received date: 4 April 2016
Revised date: 1 December 2016
Accepted date: 24 December 2016

Please cite this article as: J.M. Park, M. Murakami, H. St John, L. Lao, M. Chu, R. Prater, An efficient transport solver for tokamak plasmas, *Computer Physics Communications* (2017), http://dx.doi.org/10.1016/j.cpc.2016.12.018

An Efficient Transport Solver for Tokamak Plasmas *

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Abstract

A simple approach to efficiently solve a coupled set of 1-D diffusion-type transport equations with a stiff transport model for tokamak plasmas is presented based on the 4th order accurate Interpolated Differential Operator scheme along with a nonlinear iteration method derived from a root-finding algorithm. Numerical tests using the Trapped Gyro-Landau-Fluid model show that the presented high order method provides an accurate transport solution using a small number of grid points with robust nonlinear convergence.

Keywords: Plasma simulation, Diffusion equation, Transport, Tokamak

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