

# Sergiy Manolov

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## SUMMARY OF EXPERIENCE

- Objective C development for iOS.
- Java, C++.
- Matlab.
- Delphi, Visual Basic, VBA.
- MCNP, Scale.
- SQL, InterBase, SQL Server.
- Numerical modeling of Dynamic Processes.
- Numerical Methods.
- Nuclear Engineering and related fields.



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As an iOS consultant, I have been working on a number of projects.



My recent clients are:

Rivet Radio      [www.rivetnewsradio.com](http://www.rivetnewsradio.com)  
Biomet            [www.biomet.com](http://www.biomet.com)  
Sears Holdings   [www.searsholdings.com](http://www.searsholdings.com)

### Rivet Radio

This is an innovative radio app that delivers personalized audio news to user's iPhone. A user decides what subjects she wants to listen to and the app will play only the stories in the specified categories.

Target: iOS7.1 and iOS8. Native iOS application using CocoaTouch, Location Services, CoreGraphics.

Webservices: Restful, JSON. Remote analytics using Crittercism and Flurry SDKs.



### Biomet Sales iPad app

The app is used by the Biomet sales representatives (~250 users).

Target: iOS7.1 and iOS8.1.

Native iOS application using Cocoa Touch, Location Services, Core Graphics.

Web services: Restful services and SOAP, JSON and XML.



As an iOS consultant, I have been working on a number of projects.



**SEARS Internal Applications**  
The apps used internally by Sears sales associates.  
Target: iOS6.1 and iOS7.  
Hybrid application using Cocoa Touch, HTML, Java Script.  
Web services: Restful services, JSON.



**Rent Finder**  
The app searches for the rental properties around a particular address.  
Target: iOS6.1  
Map: AppleMap  
External APIs: Zillow APIs, GetDeepSearch-Results API, Property Details API  
Response format: XML

# I also have my own app in the App Store

**Bank Explorer**  
By Sergiy Manolov  
Open iTunes to buy and download apps.

**Description**  
Did you know that you can open a checking account that yields more than 2% APY? This app allows you to browse through a list of high-yield bank accounts in US. We have a large database of accounts and constantly update the information.

**SUPPORTED ACCOUNT TYPES:**  
- Checking accounts.  
- Savings accounts.  
- Certificate of Deposit.  
- Money Market accounts.

**Bank Explorer Support**

**\$2.99**  
Category: Finance  
Released: Mar 04, 2014  
Version: 1.0.0  
Size: 11.3 MB  
Language: English  
Seller: Sergiy Manolov  
© Sergiy Manolov  
Rated 4+

**Compatibility:** Requires iOS 7.0 or later. Compatible with iPhone, iPad, and iPod touch. This app is optimized for iPhone 5.

**Customer Ratings**  
We have not received enough ratings to display an average for this application.

**iPhone Screenshots**

**Search Results** Reload  
American Express  
3 accounts available  
Min APY: 0.4% Max APY: 0.85%

**Filter Options**  
Minimum APY: 0.0%  
0% 3%  
Maximum APY: 7.0%  
0.0% 7%  
Savings accounts  
Checking accounts  
CD accounts  
Other accounts

**High-Yield Savings Account**  
Type: savings, APY: 0.85%

**6 Month CD**  
Type: CD, APY: 0.4%

**12 Month CD**  
Type: CD, APY: 0.55%

**iTunes** App Store  
Like 31,435,152 Like 9,097,502

Become a fan of the iTunes and App Store pages on Facebook for exclusive offers, the inside scoop on new apps and more.

This app allows you to browse through a list of high-yield bank accounts in US. We have a large database of accounts and constantly update the information.

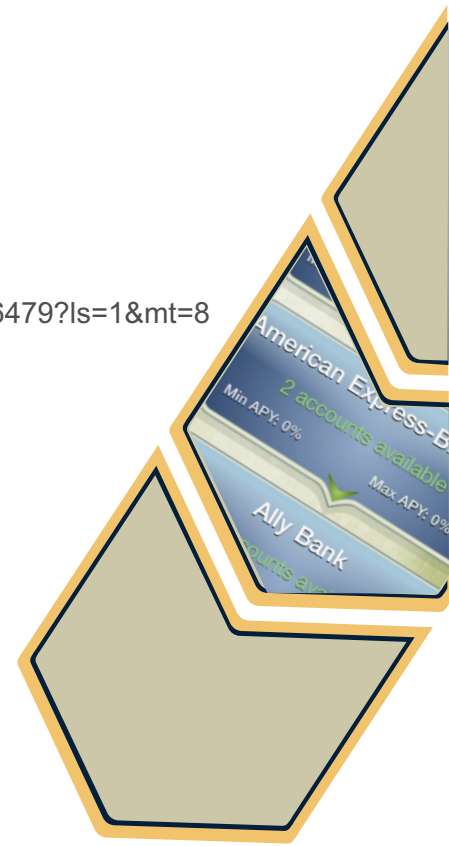
## SUPPORTED ACCOUNT TYPES:

- Checking accounts.
- Savings accounts.

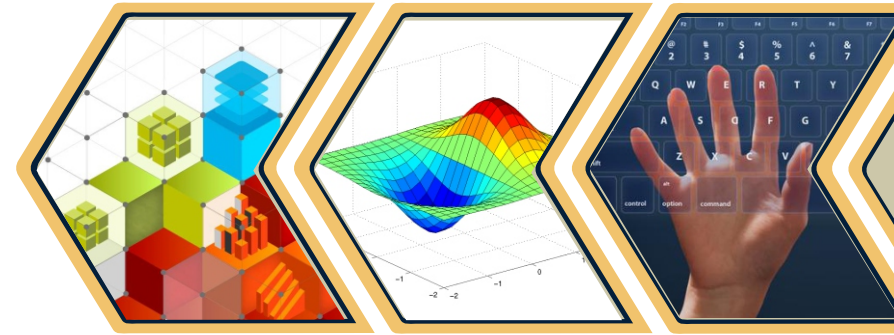
Supports iPhone, iPod Touch and iPad.  
Optimized for iPhone 5.

Built with iOS7 SDK.

<https://itunes.apple.com/us/app/bank-explorer/id823136479?ls=1&mt=8>

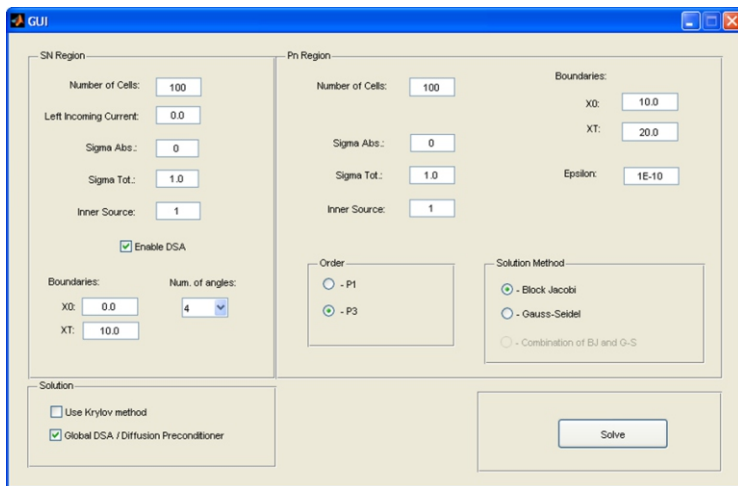


I was working on the project which studied different numerical models for neutron transport (Sn, Pn and Diffusion), their coupling and optimization.

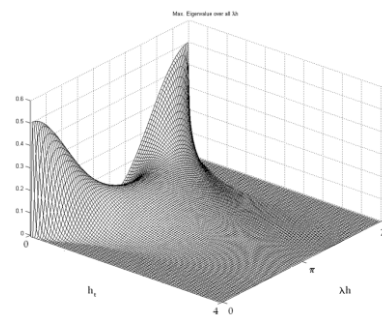


GUI of the Computational Module (Matlab)

## HYBRID SN /DIFFUSION and SN /P3 NEUTRONICS CALCULATIONS



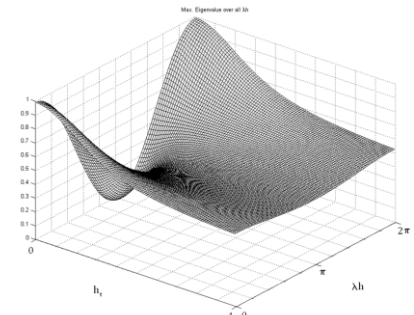
I have investigated coupling and preconditioning techniques for 1-D hybrid neutronics calculations. Each problem was represented by two spatial regions with Sn in one region and either Diffusion (P<sub>1</sub>) or P<sub>3</sub> in the other region. For each of these two cases we define one coupling scheme and two different preconditioned systems. These systems were solved with both fixed-point iteration and the GMRES Krylov method. The solution techniques are compared in terms of iteration count and computational cost. Preconditioning with a global diffusion operator is found to be very effective for the most difficult problems.



HYBRID SN /DIFFUSION and SN / P3 NEUTRONICS CALCULATIONS

Results of Spectral Analysis of computational schemes

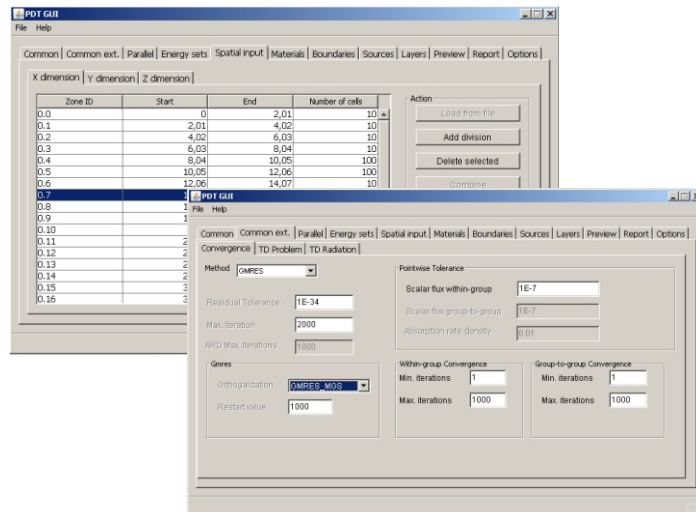
(Matlab)



# PDT

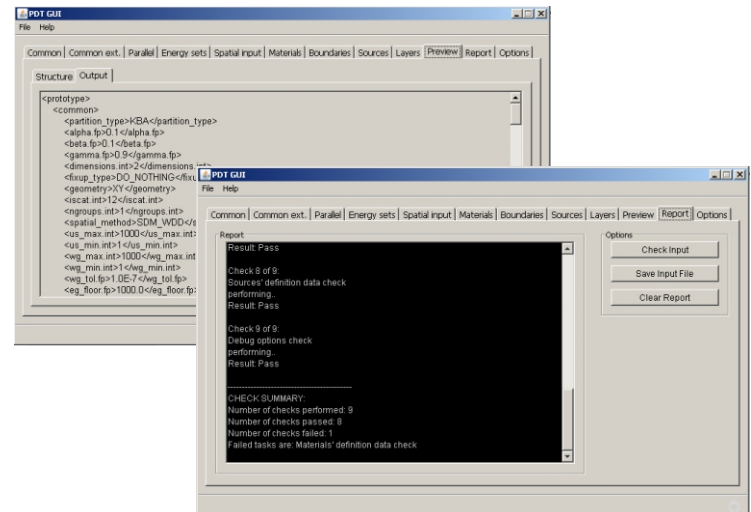
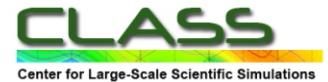
The PDT code solves particle transport equations. PDT was design to solves the time-dependent and static 3-D radiation transfer equation on general polyhedral meshes using the backward-Euler, Crank-Nicholson, or TBDF-2 time discretizations, the Sn angular discretization, the multigroup energy discretization, and a piecewise-linear discontinuous Galerkin spatial

PDT GUI and Input File Editor  
(Java, Netbeans)



# PDT features

- PDT is designed to take advantage of the High Performance Computing systems: clusters and supercomputers.
- PDT uses MPI and OpenMP libraries to support parallel computing.
- The Center for Radiative Shock Hydrodynamics at the University of Michigan (CRASH) used the PDT code to calculate the propagation of heat and radiation from a laser beam inside a Berillium target.



# DC BARS is a company develops various avionics systems: control and management, communications for the USA companies (Avidyne and Honeywell).

## Software verification for the following systems:

- Flight Display
- Navigation
- Flight Control
- Flight Safety

## Tools

- MS Visual Studio.
- VBA and specially designed scripting language.
- Flight Control Simulator.

## Operating Systems

- Windows 2000.
- LynxOS - real-time Operating System.

Software verification for different avionics systems according to the lists of low-level and high-level requirements and the industry standards (ARINC). The test cases were developed using scripting languages that communicated with the simulator through specially designed intermediate libraries.



<http://www.dcbars.net>





# My publications

*Nuclear Mathematical and Computational Sciences: A Century in Review, A Century Ahead*  
Gallatin, Tennessee, April 6-11, 2003, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2003)

## KRYLOV ITERATIVE METHODS APPLIED TO MULTIDIMENSIONAL $S_N$ CALCULATIONS IN THE PRESENCE OF MATERIAL DISCONTINUITIES

James S. Warsa, Todd A. Wareing, Jim E. Morel  
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### ABSTRACT

We show that a Krylov iterative method, preconditioned with DSA, can be used to efficiently compute solutions to diffusive problems with discontinuities in material properties. We consider a lumped, linear discontinuous discretization of the  $S_N$  transport equation with a "partially consistent" DSA preconditioner. The Krylov method can be implemented in terms of the original  $S_N$  source iteration coding with little modification. Results from numerical experiments show that replacing source iteration with a preconditioned Krylov method can efficiently solve problems that are virtually intractable with accelerated source iteration.

**Key Words:** Krylov iterative methods, discrete ordinates, deterministic transport methods, diffusion synthetic acceleration

### 1 INTRODUCTION

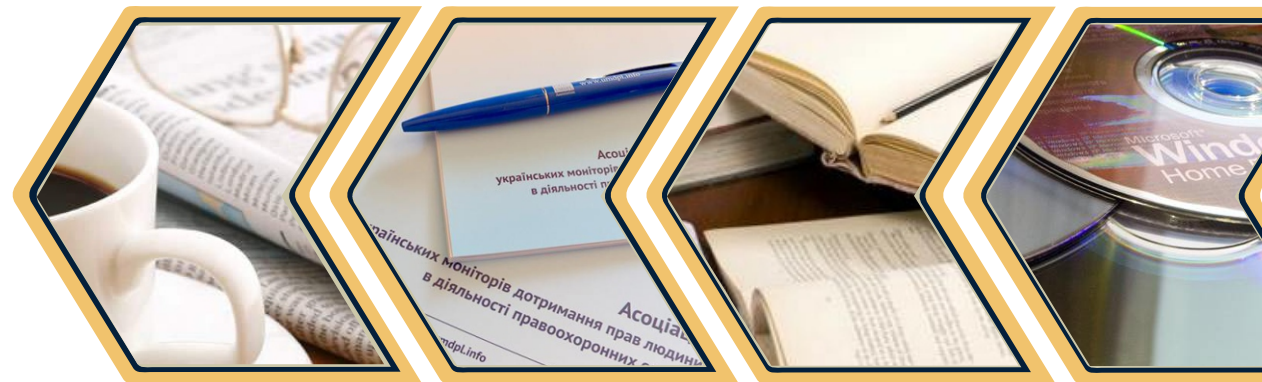
A spatial discretization of the DSA diffusion equations that is consistent with the discretization of the transport equation is usually considered a sufficient condition for a DSA method to be unconditionally effective [1-3]. However, the degradation of DSA methods – even fully consistent ones – in problems with discontinuities in material properties means that consistency is not enough to guarantee the effectiveness of a DSA method. This was first identified in [4] and [5] and revealed as a general deficiency of DSA in a paper at this conference.

For this paper, we follow on the work of Ashby, et al. [6], Brown [7], and Guthrie, et al. [8], where Krylov methods preconditioned by DSA replace traditional source iteration on the scalar flux, and extend their approach to our linear discontinuous finite element method (DFEM) on unstructured tetrahedral grids. This discretization, including a discussion of compatible DSA methods, is presented in Sec. 2.

We find that using a more powerful iteration, like a Krylov subspace iterative method [9], significantly improves convergence for problems in which the convergence of accelerated source iteration degraded in the presence of material discontinuities. A nice feature is that the Krylov iterative method can be "wrapped around" the source iteration code so that only minor changes to the original inner iteration coding is necessary. A brief discussion of the formulation and implementation of the preconditioned Krylov iterative solution method, including an overview of related work, is presented in Sec. 3

Sergiy Manolov, Jim E. Morel, Cristian Rabiti. Hybrid  $S_N$ /Diffusion and  $S_N$ -P<sub>3</sub> Transport Calculations. International Conference on Mathematics and Computational Methods Applied to Nuclear Science & Engineering (M&C 2013). Sun Valley, Idaho, USA, May 5-9, 2013.

Sergey Manolov (2004). "Subcritical Assembly on the IRT MEPhI as the Neutron Source for Research of Physical Processes in the PWR". papers of Scientific MEPhI conference.



## My education



**April 2013:**

Unbounded Solutions  
Objective C training for iOS  
development.

**December 2012:**

Texas A&M University  
Master's degree in Nuclear  
Engineering, GPA: 3.608.

Мой компьютер.Ink

**February 2004:**

Moscow Engineering-Physics Institute (MEPhI university).  
Bachelor's degree in Nuclear  
Engineering

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# Sergiy Manolov

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Engineer

## THE COMPANIES I WORKED FOR:



Sears Holdings



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