

Comparison of Simulation Tools ATP-EMTP and MATLAB-Simulink for Time Domain Power System Transient Studies

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Abstract - Continuous development of appropriate software packages makes simulation of power engineering problems more and more effective. However, these analysis tools differ from each other considerably from the point of view of the applicability to a special problem. The authors compare two widespread environments: MATLAB-SIMULINK, which can be used to simulate a wide spectrum of dynamic systems, and ATP-EMTP, which is specific software to simulate power system transient problems. In the first part of the paper the components (function-blocks) that can be used to build a circuit, are listed. Then three examples are presented which demonstrate the capabilities and underline the advantages and drawbacks of both programs.

Keywords: ATP-EMTP, MATLAB-Simulink, time domain simulation, educational use

1 Introduction

There are numerous widespread commercial software tools used by power engineers for electrical circuit simulation purposes. It is, however, a challenging and time consuming task to get acquainted with all the details and specialities of such a program, that's why the majority of the users is not inclined to keep tabs on the evolution of similar products or does not even know them.

This paper aims to compare the capabilities of two of such software packages: ATP-EMTP/ATPDRAW and MATLAB-SIMULINK. The first one is a universal program system for digital simulation of transient phenomena of electromagnetic as well as electromechanical nature, whereas SIMULINK was created to model general dynamic systems using MATLAB simulation engine.

2 Comparison of the elements of the two programs

Both programs are block-oriented simulators with a graphical user interface. In both cases there are two types of connections between the blocks: electrical and signal wires. Former ones link blocks like transformers, lines etc. while the latter ones connect the signal processing units. In ATP-EMTP these blocks can be TACS or MODELS objects.

The following tables summarise the most important built-in elements (blocks) of the two program packages. Only objects supported by ATPDraw have been considered in the ATP-EMTP column of the next tables.

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Lei Shi

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Power System Transient Analysis Eiichi Haginomori,Tadashi Koshiduka,Junichi Arai,Hisatoshi Ikeda,2016-02-29

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Table of Contents Alternative Transient Program Manual

1. Understanding the eBook Alternative Transient Program Manual
 - The Rise of Digital Reading Alternative Transient Program Manual
 - Advantages of eBooks Over Traditional Books
2. Identifying Alternative Transient Program Manual
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Alternative Transient Program Manual
 - User-Friendly Interface
4. Exploring eBook Recommendations from Alternative Transient Program Manual
 - Personalized Recommendations

- Alternative Transient Program Manual User Reviews and Ratings
- Alternative Transient Program Manual and Bestseller Lists

5. Accessing Alternative Transient Program Manual Free and Paid eBooks

- Alternative Transient Program Manual Public Domain eBooks
- Alternative Transient Program Manual eBook Subscription Services
- Alternative Transient Program Manual Budget-Friendly Options

6. Navigating Alternative Transient Program Manual eBook Formats

- ePUB, PDF, MOBI, and More
- Alternative Transient Program Manual Compatibility with Devices
- Alternative Transient Program Manual Enhanced eBook Features

7. Enhancing Your Reading Experience

- Adjustable Fonts and Text Sizes of Alternative Transient Program Manual
- Highlighting and Note-Taking Alternative Transient Program Manual
- Interactive Elements Alternative Transient Program Manual

8. Staying Engaged with Alternative Transient Program Manual

- Joining Online Reading Communities
- Participating in Virtual Book Clubs
- Following Authors and Publishers Alternative Transient Program Manual

9. Balancing eBooks and Physical Books Alternative Transient Program Manual

- Benefits of a Digital Library
- Creating a Diverse Reading Collection Alternative Transient Program Manual

10. Overcoming Reading Challenges

- Dealing with Digital Eye Strain
- Minimizing Distractions
- Managing Screen Time

11. Cultivating a Reading Routine Alternative Transient Program Manual

- Setting Reading Goals Alternative Transient Program Manual
- Carving Out Dedicated Reading Time

12. Sourcing Reliable Information of Alternative Transient Program Manual

- Fact-Checking eBook Content of Alternative Transient Program Manual

- Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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