

MATLAB/SIMULINK Simulation Tool for Power Systems

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Abstract - This paper describes the modeling and simulation library for power systems simulation under SIMULINK environment. The different features of MATLAB Toolboxes used in the analysis of power systems are described. Software introduces SIMULINK environment of MATLAB for implementing user friendly and future expansion. To illustrate the capabilities of SIMULINK simulation tool, a case study based on a test system is presented.

Keywords - Modeling; Protective relaying; Power System Blockset.

I. INTRODUCTION

A product of The MathWorks, Inc. MATLAB started life as a program designed to perform matrix mathematics, but over the years it has grown into a flexible computing system capable of solving essentially any technical problem. MATLAB can manipulate and invert large matrices and can be used in many numerical applications. MATLAB's capabilities can be extended with addition called SIMULINK, a program which is normally used in the analysis and synthesis of modern systems.

SIMULINK, now incorporated into MATLAB, can also be used to analyze and design of power systems. During last four decade's simulation of power systems have gained more importance. Recently published IEEE paper discussing different approaches to modeling protective relays and related power system events indicates a variety of possible software tools that may be used for this purpose [1]. But rather than MATLAB/SIMULINK software it is difficult to add the modeling and simulation features to teach specific protective relaying concepts that go beyond the level of detail originally provided by the software. The MATLAB software package with SIMULINK support and Power System Blockset (PSB) [2, 3] is utilized to develop customized model libraries for teaching protective relaying concepts.

In this paper the section II describes the reasons for using MATLAB compared with EMTP/ATP; section III

describes features of MATLAB toolboxes; section IV focused on block libraries of Power System Blockset and section V describes a case study.

II. MATLAB DE-FACTO STANDARD

When we compare MATLAB/SIMULINK with EMTP/ATP, we will see which one is better for the power systems simulation. The following items summarize their most important differences in protection systems simulation [4]:

1. The EMTP/ATP is specific software to simulate power system transient problem, whereas the MATLAB/SIMULINK can be used to simulate power system faults and protective relay algorithm at the same time.
2. ATP/EMTP is designed to simulate the physical processes of transmission lines and transformers quickly and in a convenient way but MATLAB/SIMULINK offers more possibilities in power electronics, signal processing and control.
3. Users can easily create new relay model with MATLAB/SIMULINK, whereas EMTP/ATP doesn't have such capacity.
4. MATLAB/SIMULINK encompasses better graphic function tools than EMTP/ATP of pcpilot, plotxy and so on.

Therefore, for automatic interactive systems MATLAB/SIMULINK is selected.

Matlab Simulink Simulation Tool For Power Systems

Marcel A. Müller



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baca juga contoh hukum newton 3 dan penjelasannya i $\Sigma m r n^2$ rumus 2 rumus 2 digunakan jika terdapat beberapa benda atau partikel yang berotasi terhadap sumbu rotasi contoh soal rumus 2

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besar momen inersia dihitung dengan rumus untuk benda berupa partikel tunggal titik massa i $m r^2$ untuk beberapa partikel titik massa i $\Sigma m r^2$

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aug 30 2016 y cy 2 71 cm ada rumus umum mencari titik berat gabungan penampang berlaku juga untuk sumbu y hitung momen inersia ix gabungan dengan persamaan dimana adalah jarak titik berat masing masing penampang tunggal ke titik berat penampang gabungan untuk kasus di atas sehingga untuk sumbu y dimana karena titik berat

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momen inersia terhadap sumbu x y yang melalui titik berat penampang z adalah I_{xz} atau $I_x + I_z - I_x I_z / I_y$ dan I_{yz} atau $I_y + I_z - I_y I_z / I_x$ momen inersia terhadap sumbu x adalah $I_x + I_z - I_x I_z / I_y$ momen inersia terhadap sumbu y adalah $I_y + I_z - I_y I_z / I_x$

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jun 26 2009 adalah momen inersia terhadap sumbu x tertentu adalah momen inersia terhadap sumbu netral garis berat adalah luas bangun penampang adalah jarak dari titik berat ke sumbu momen inersia yang dicari catatan untuk tinjauan sumbu y tinggal ditukar aja kok x jadi y y jadi x

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membuat titik berat pita menentukan momen terhadap sumbu x m_x dan sumbu y m_y selanjutnya menghitung titik berat tersebut dengan integral 4 untuk menghitung momen inersia langkahnya dimulai dengan membuat pita sejajar dengan garis l sumbu x dan titik berat pita kemudian dibentuk hasil kali luas

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sep 7 2023 x 100 8 2 104 mm 10 4 cm sementara untuk sumbu y karena masing masing elemen siku l100x100x10 posisi titik berat cy nya berjarak sama dari sumbu dasar maka titik berat gabungannya juga akan sama y cy 2 71 cm ada rumus umum mencari titik berat gabungan penampang berlaku juga untuk sumbu y

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tetap 2 rad s^{-1} jika jari jari lintasan partikel 10 cm maka momentum sudut partikel itu adalah pembahasan momentum sudut partikel $10^5 \times 10^5 \text{ kg m}^2 \text{ s}^{-1} \times 10^5 \text{ kg m}^2 \text{ s}^{-2}$

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aug 26 2017 sedangkan bola pejal berjari jari 5 cm dan massa 4 kg jika kedua benda tadi berotasi dengan poros melalui pusatnya maka tentukan perbandingan momen inersia silinder dan bola jawab $m \text{ s}^2 \text{ kg r s}^2 \text{ cm}^8 \text{ 10}^2 \text{ m m b}^4 \text{ kg r b}^5 \text{ cm}^5 \text{ 10}^2 \text{ m}$ momen inersia silinder pejal adalah $i \text{ s}^2 \text{ m s r s}^2 \text{ 1}^2 \text{ 2}^2 \text{ 8} \text{ 10}^2 \text{ 2}^2 \text{ 64} \text{ 10}^4 \text{ kg m}^2$

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besarnya momen inersia suatu benda bergantung terhadap beberapa faktor yaitu massa benda atau partikel geometri benda bentuk letak sumbu putar benda jarak ke sumbu putar benda lengan momen rumus momen inersia besarnya momen inersia i suatu benda bermassa yang memiliki titik putar pada sumbu yang diketahui dirumuskan sebagai berikut

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