Modelica-based Technologies for Power Systems Modeling Applications

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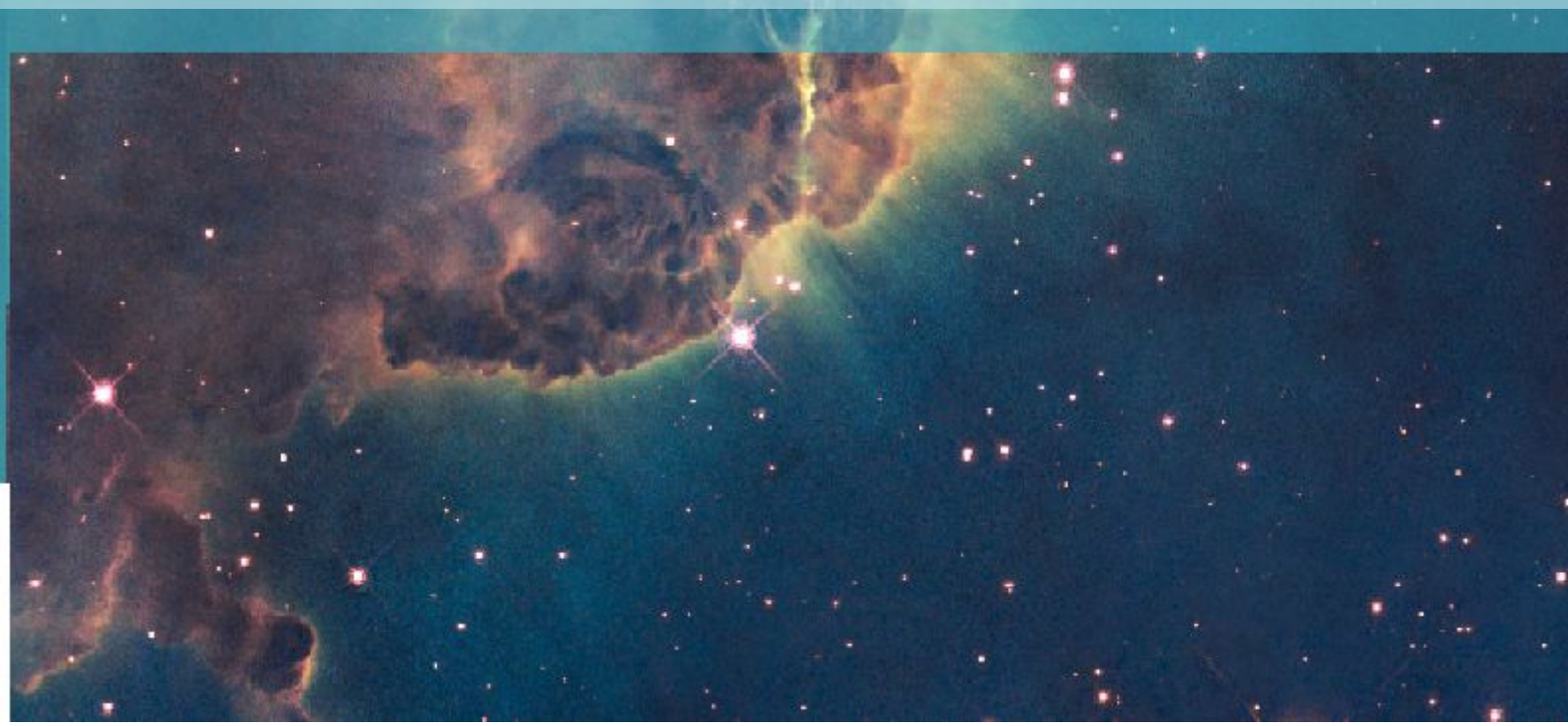
Atiyah M. G. Elsheikh & Peter Palensky



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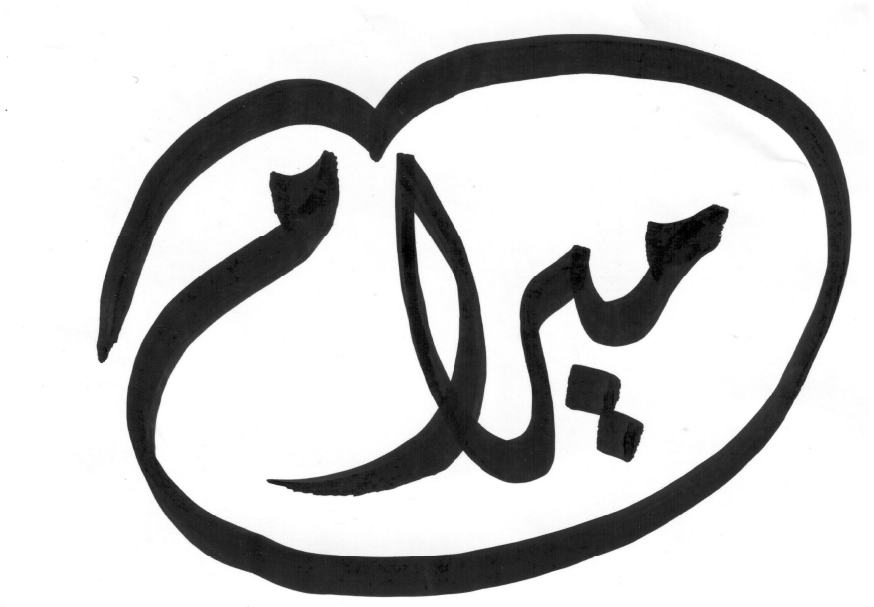

Abstract

This is a comprehensive but a concise and educational (e-)book aiming at advertising Modelica-based technologies particularly useful for power system modeling applications. Whatever aspect that could be useful has been included, to the best of author's knowledge. We hope that this book is useful not only for power system modelers desiring to get a quick idea about the benefits of employing Modelica but also for those Modelica modelers desiring a starting guide into the world of Power System.

Involvement & Conditions

If you are clearly involved in power-system related activities using the Modelica language, you are highly encouraged to actively improve the state of this book whenever and/or wherever possible. For this reason, this book is available on the platform Overleaf which allows collaborative writing. The latex sources will synchronously available on (a private) Github repository.

However, it is important to note that, any suggested enhancement should be valuable, concise, accurate and elegant. The authors have the right to reject or to ask for specific corrections or improvements to any suggested enhancement.

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Consider contacting atiyah.elsheikh@mathemodica.com if you would like to:

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Acknowledgment

Atiyah Elsheikh is highly appreciating his former employer, Austrian Institute of Technology, as this book has been initially started during his role there, initially as a technical report. The early version was still in a primitive state until he recently decided to write a comprehensive book.

Moreover, couple of capitals of this book has been written by others. Without their contribution, the book would be definitely less valuable. Thus, I'd like to thank (in alphabetical order of family names):

- Prof. Andrea Benigni, RWTH Aachen and FZ Jülich, with his great help, this report is suitable for Electrical Engineers. Particularly, major parts of Chapter 2 and Chapter **??** were originally written by him.

- Assoc. Prof. Omar Faruque, Florida State University, for presenting this initiative at a PES general meeting

- Prof. Antonello Monti, RWTH Aachen, being the initiator of the idea of having a comprehensive report that gathers all useful aspects Modelica can provide for power system modeling applications. The first chapter was originally written by him.

I also would like to thank

- Dr. Mathias Legrand for allowing to employ this wonderful latex template found under

  https://www.latextemplates.com/template/the-legrand-orange-book

I believe that online Modelica educational materials need to be gathered together and since the idea of having a freely accessible book that is meanwhile sponsored (or to be sponsored) by any one on the basis of pay-as-much-as-you-think-this-book-deserve is inspired by the author of the book "Modelica by Examples", thus, my special appreciation goes to Dr. Michael Tiller, for:

- his initial agreement in hosting or linking a future html-version of this book in the platform

  https://modelica.university

  .
- his technical tips, recommendations and his willing to help me (despite apparently being a very busy person with duties)

I hope to have enough energy in near future and learn the technology needed to bring this book to the platform modelica.university and to establish url-links to adequate materials in his book whenever more in-depth clarification of Modelica syntax is needed. In that way, the focus of this book can remain on the applications side of power systems rather than attempting to illustrate the Modelica language in details.

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