









16th Modelica & fmi Conference

Preliminary Program

times and content may be subject to change

Monday, 8. Sep.	Start	Arrival / Reception in Rotkreuz with Welcome Coffee					
	11:30	Welcome Speech					
	13:00	Tutorials: all in parallel					
	13:30	Introduction to Modeling and Simulation, Debugging with Modelica and OpenModelica	FMI Beginners Tutorial	Introduction to System Structure and Parameterization (SSP)	eFMI: A beginner's overview and hands-on	Beyond Simulation: Building Workflows and Web Interfaces with Modelica and Python	
		Modeling complex thermal architectures using the DLR ThermoFluid Stream Library	3DS: Exporting and importing an FMU using C code	Using SMARTInt+: Machine-learning and easy integration of AI in Modelica	M&S of Robotic Arm Dynamics and Control in Modelica with MWORKS.	From Uncertainty-Aware Simulation to Learning-Based Control using FMI and Python	
		Regression Testing with Dymola and the Testing Library	CasADi tutorial on dynamic optimization with FMI 3.0 Model Exchange	Modeling and Simulation of profitableness in Modelica industrial energy systems...	FMI3 co-simulation with UniFMU	Modiator: Develop a specialized Modelica Web-App	
	14:45	Coffee Break with Poster Presentations					
	15:15	Tutorials continued					
	16:30	Short Break					
	16:45	1 Platin and 3 Gold and 1 Silver Vendor Presentations: LTX, Dassault Systèmes, Modelon, Tongyuan, OpenModelica			7 Silver Sponsor Presentations: JuliaHub, Wolfram, XRG, orthogonal, eXXcellent, Claytex, MathWorks		
19:05	Welcome Reception						
Tuesday, 9 Sep.	08:30	Welcome Coffee					
	08:50	Conference Opening by Ulf Christian Müller					
	09:00	Keynote of Prof. Mishra Siddhartha on Physics-Informed AI					
	09:45	Modelica and FMI News by Dirk Zimmer					
	10:00	Short Coffee Break with Poster Presentations					
		Scientific Track on General Modelica	Scientific Track on Energy	Scientific Track on Control & AI	Scientific Track on FMI and related	Industrial Users Presentations	
	10:20	Modelica Tool Development	Power System Simulation	Modelica & AI	FMI Tool Development	Modelica Applications	
	12:00	Lunch					
	13:00	Chemics, Pharmacology and Medicin	Thermal Management for Green Energy Systems	Robotics	Layered Standards	Aerospace	
	14:15	Coffee Break with Poster Presentations					
	14:45	Digital Twin	Media Property modellling	Control for HVAC and Buildings	FMI for energy systems	Credible Simulation, Traceability, SSP	
	16:00	Panel discussion on the value of open standards					
	17:00	Transfer to Lucerne is individual by Train (Boarding at KKL)					
	18:00	Boat-Cruise-Dinner (Departure 18:30 / Arrival 22:30 / 30 min Boarding and Exit)					
	Wednesday, 10 Sep.	08:00	Welcome Coffe				
		08:30	Keynote of Dr. Johan R Åkesson on Opportunities and Challenges in Design and Operation of Integrated Energy Systems				
		09:15	Simulation and Optimization	Pumps and Vapour Compression	FMI for Embedded Systems and Virtual Prototyping	Workflows in Systems Engineering	FMI Applications
10:30		Coffee Break with Poster Presentations					
11:00		Modeling Methods and Tools	Energy Generation Systems	Control- and AI-based Methods with FMI for Automotive	Maritime Applications	Modelica Applications	
12:40		Lunch					
13:40		Awards and Announcements					
14:10		New Translation Methods and Language Experiments	Fuel Cell Modeling and Control	Control Applications in Modelica	Automotive	FMI and SSP for Model-Based System Engineering	
15:50		Coffee To Go					

Scientific Track					Industrial Track
General Modelica		Energy	Control & AI	FMI and related	Industrial Users
Tue, 10:20	Modelica Tool Development	Power System Simulation	Modelica & AI	 FMI Tool Developement	Modelica Applications
	<i>Hans Olsson</i> Improved Unit Inference and Checking in Modelica	<i>Marcelo de Castro and Luigi Vanfretti</i> OpenIWPI: Open-Instance Wave-Phasor Interface Library for Power System Simulation Studies in Modelica	<i>Andreas Hofmann and Lars Mikelsons</i> Towards Integration of PeN-ODEs in a Modelica-based workflow	<i>Luis Sanchez-Heres, Fredrik Olsson and Jan Östh</i> Liaison: an open-source tool for distributed co-simulations	<i>Kanadevia Inova AG</i> Process-based Life-Cycle Sustainability Analysis of Integrated Solid Waste Management Systems: A Decision-Support Platform using OpenModelica
	<i>Henrik Tidefelt and Quentin Lambert</i> Implicit Unit Conversion in Modelica	<i>Srijita Bhattacharjee, Fernando Fachini and Luigi Vanfretti</i> Expanding an Open-Source Modelica-Compliant Package of Generic Renewable Energy Source Models: Implementation of the REEC_D and REGC_B Models in Modelica and OpenIPSL	<i>Linus Langenkamp, Philip Hannebohm and Bernhard Bachmann</i> Efficient Training of Physics-enhanced Neural ODEs via Direct Collocation and Nonlinear Programming	<i>Michele Urbani, Michele Bolognese, Luca Praticò and Matteo Testi</i> A Tool for the Implementation of Open Neural Network Exchange Models in Functional Mockup Units	<i>Optimization AB</i> On the challenges of large-scale simulation platforms and our solution to overcome them
	<i>Zhipeng Chen, Zhichao Huang, Chong Zhou, Yinqi Chen, Qi Liu, Fanli Zhou and Liping Chen</i> Model Disambiguation Technology in MWORKS.Sysplorer	<i>Herbert Schmidt</i> Analytical Treatment of Hollow Toroid Flux Tubes	<i>Tim Jonas Hanke, Johannes Brunnemann, Robert Flesch and Jörg Eiden</i> Status of the SMarTint Library: Simple Modelica Artificial Intelligence Interface	<i>Erik Henningsson, Christian Schulze, Julius Aka, Manuel Gräber, Dag Brück, Elmir Nahodovic and Oliver Lenard</i> Input Smoothing for Faster Co-Simulation using FMI	<i>Electric Power Research Institute, US</i> System Cost of Hydrogen Optimization & Sub-Hourly Comparative Analysis of PEM and Alkaline Electrolyzer Operation
Tue, 13:00	Chemics, Pharmacology and Medicin	Thermal Management for Green Energy Systems	 Robotics	 Layered Standards	 Aerospace
	<i>Marek Matejak</i> Chemical 2.0 (Free open-source Modelica library)	<i>Finn van Ginneken and Alexander Busch</i> Modelling, Simulation and Validation of thermal propagation for 3D discretized battery cells in Modelica	<i>Sebastian Rojas-Ordoñez, Mikel Segura and Ekaitz Zulueta</i> Integration of Physical and AI Models Using Open and Interoperable Standards: A Model-Based Methodology for Autonomous Robot Development	<i>Buffoni, Elmir Nahodovic, Robert Hällqvist, Oliver Lenard, Hans Olsson, Martin Otter, Antoine Vandamme and Adrian Pop</i> Towards a Common Standard for Uncertainty Quantification	<i>Dassault Aviation</i> Bridging the gap between System Engineering and Simulation, applied to collaborative design of Aircraft Systems
	<i>Tomas Kulhanek, Filip Jezek, Jiri Kofranek, Marek Matejak and Stef Rommes</i> Pharmacolibrary - Free Library to Model Pharmacology	<i>Lone Meertens, Jelger Jansen and Lieve Helsen</i> Development and Experimental Validation of an Unglazed Photovoltaic-Thermal Collector Modelica Model that only needs Datasheet Parameters	<i>Matthias Reiner</i> Modelica FMI based hybrid reinforcement learning enhanced trajectory planning for an ADR scenario for combined control of a satellite with a 7-axis robotic arm using Modelica/FMI	<i>Tobias Thummerer, Hans Olsson, Chen Song, Julia Gundermann, Torsten Blochwitz and Lars Mikelsons</i> LS-SA: Developing an FMI layered standard for holistic & efficient sensitivity analysis of FMUs	<i>Saab Aeronautics</i> OpenSCALING: A Saab Aeronautics Perspective
	<i>Clément Coïc and Marco Masannek</i> Combining static and dynamic optimization approaches for path planning, with collision avoidance	<i>Markus Gillner and Arne Speerforck</i> Modelling Aquifer Thermal Energy Storage (ATES) System with Buoyancy Flow	<i>Antoine Pignède and Carsten Oldemeyer</i> Automatic Modelica Package and Model Generation from Templates and Data Files with Python, Exemplified with URDF	<i>Christian Bertsch, Kahramon Jumayev, Andreas Junghanns, Pierre R. Mai, Benedikt Menne, Masoud Najafi, Tim Pfitzer, Jan Ribbe, Klaus Schuch, Markus Süvern and Patrick Täuber</i> FMI Layered Standard for Network Communication: Applications in Networked ECU Development	<i>AIRBUS SAS, ALTEN</i> FMI Standard and Airbus Needs, Usages and Expectations Full Version
Tue, 14:45	 Digital Twin	Media Property modelling	Control for HVAC and Buildings	 FMI for energy systems	 Credible Simulation, Traceability, SSP
	<i>Corentin Lepais and Dirk Zimmer</i> Prototypical Control for the Digital Twin of Aircraft Environmental Control System	<i>Pascal Borel, Rafik Moulouel, Antoine Chupin and Felix Marsollier</i> TAeZoSysPro: A Modelica Library for Thermal Aeraulic and Buildings Thermodynamics Calculations	<i>Michael Wetter, Yan Chen, Karthik Devaprasad, Paul Ehrlich, Antoine Gautier, Jianjun Hu, Anand Prakash and Marco Pritoni</i> Modelica Meets ASHRAE: Towards A Digital Standard for Building Control	<i>Karim Besbes</i> An innovative heterogeneous modeling approach to build a cooling system for battery thermal management with common fluid properties involving FMI terminals	<i>AVL List GmbH, Robert Bosch GmbH</i> Integration of systems engineering and simulation based on standards: The needs, challenges and solutions from an industrial perspective
	<i>Andreas Heckmann, Alexander Poßbeckert and Vijaya-Bhaskar Adusumalli</i> Aspects and Ideas for the FMI-based Modeling of Railway Digital Twins	<i>Rohit Dhumane, Dan Gorman, Rajkumar K S and Dongping Huang</i> Development of a Refrigerant Mixture Package for Dynamic Simulation of Auto-Cascade Refrigeration: A Case Study with R23/R134a	<i>Karl Walther, Michael Wetter, Anand Prakash and Jianjun Hu</i> CDL-PLC translator: From Modelica HVAC control design to IEC 61131 PLC implementation	<i>Sagnik Basumallik, Luigi Vanfretti, Mohammad Ali Dashtaki, Ziang Zhang, Reza Pourramezan and Hossein Hooshyar</i> Enhancing Large-Scale Power Systems Simulations through Functional Mockup Unit-based Grid-Forming Inverter Models	<i>Robert Bosch GmbH, Dassault Systèmes AB, eXXcellent solutions GmbH</i> Towards a Credible System Simulation Architecture applicable to Heat Pump Systems using Modelica, FMI and SSP
	<i>Gerhard Hippmann and Blas Blanco Mula</i> Collaborative Digital Twin Development for Railway Braking and Traction Applications	<i>Hubert Blervaque and Félix Marsollier</i> A Generic Non-Miscible Liquid-Gas Medium Model in Modelica with Analysis of Incompressibility Assumptions	<i>Lucas Bex, Muhammad Hafeez Saeed, Lucas Verleyen, Lieve Helsen and Geert Deconinck</i> Yet Another Residential District Simulator: yards for Controller Development in the Residential Built Environment	<i>Ruirui Zeng, Hui Gao, Wei Liu, Lei Huang, Qi Liu, Jian Liu and Xingjian Han</i> Design and Simulation Validation of Steam Power Systems Based on MBSE	<i>Robert Bosch GmbH, PMSF IT Consulting, eXXcellent solutions GmbH</i> Traceability and Support of Modeling & Simulation using SSP-Traceability Layered Standard

Wed, 09:15	Simulation and Optimization	Pumps and Vapour Compression	 FMI for Embedded Systems and Virtual Prototyping	 Workflows in Systems Engineering	 FMI Applications
	<i>Francesco Casella, Bernhard Bachmann, Karim Abdelhak, Philip Hannebohm and Teus van der Stelt</i> Diagnosing Newton's Solver Convergence Failures in the Initialization of Modelica Models	<i>Raphael Gebhart, Martin Düsing, Niels Weber and Franciscus L. J. van der Linden</i> Centrifugal Pump Model of the DLR Thermofluid Stream Library	<i>Tom Reynaud, Erfan Enferad and Maxime Lefrancois</i> Facilitating the use of Physics-Based Simulations on Embedded Devices by running FMUs from MicroPython	<i>Mark Williams, Hubertus Tummescheit, Ajaykumar Mst and Jose Maria Alvarez-Rodriguez</i> The Fundamental Modeling Practices and Specifications to support the Preservation and Reuse of Analytical Simulations	
	<i>Matteo Luigi De Pascali, Lorenz T. Biegler, Emanuele Martelli and Francesco Casella</i> Modelica2Pyomo: a tool to translate Modelica models into Pyomo optimization models	<i>Jiacheng Ma and Matthis Thorade</i> Frost/Defrost Models for Air-Source Heat Pumps with Retained Water Refreezing Considered	<i>Nils Bosbach, Meik Schmidt, Lukas Jünger, Matthias Berthold and Rainer Leupers</i> FMI Meets SystemC: A Framework for Cross-Tool Virtual Prototyping	<i>Erik Rosenlund, Robert Hällqvist, Robert Braun and Petter Krus</i> Automation Nation: Taming Complex V&V Workflows	
Wed, 11:00	<i>Linus Langenkamp and Bernhard Bachmann</i> Enhancing Collocation-Based Dynamic Optimization through Adaptive Mesh Refinement	<i>Scott Bortoff, Vedang Deshpande, Christopher Laughman and Hongtao Qiao</i> A Dynamic Analysis of Refrigerant Mass in Vapor Compression Cycles	<i>Tobias Kamp, Christoff Bürger, Johannes Rein and Jonathan Brembeck</i> Hybrid Simulation Models for Embedded Applications: A Modelica and eFMI approach	<i>Christoph Steinmann, Konstantin Wrede, Jens Schirmer and Jens Lienig</i> Integration of Geometric Tolerance Analysis in System Simulations via Functional Mock-up Units	 Renault Optimizing Assemblies of FMUs
	Modeling Paradigms and Language Experiemnts	Energy Generation Systems	 Control- and AI-based Methods with FMI for Automotive	 Maritime Applications	
	<i>Gaadha Sudheerbabu, Dragos Truscan, Mikael Manngård and Kristian Klemets</i> Validation of Dynamic Simulation Models using Metamorphic Testing and Given-When-Then Patterns	<i>Inga Beyers, Lukas Krebeck, Astrid Bensmann and Richard Hanke-Rauschenbach</i> Modelling and Impact of Hydraulic Short Circuit Operation in Pumped Hydro Energy Storage	<i>Minsu Hyun</i> A Study on Vehicle Suspension Loads Prediction Method Based on Hybrid Road Simulation using Modelica Library and FMI	<i>Karl Gunnar Aarsæther and Stian Skjong</i> Shared sea-environment definition and realization for maritime and offshore co-simulations	
	<i>Dirk Zimmer</i> The Value of Enforcing a Strict Modeling Methodology within Modelica	<i>Igor Belot, Francois Nepveu, Pierre Garcia, Nathan Fournier, Teddy Chedid, Etienne Letournel, Pierre Delmas, Alexis Gonnelle and Guillaume Raigné</i> Introducing the NewLib Library and its application to multi-level, large-scale solar field models	<i>Tobias Thummerer, Fabian Jarmolowitz, Daniel Sommer and Lars Mikelsons</i> Br(e)aking the Boundaries of Physical Simulation Models: Neural Functional Mock-up Units for Modeling the Automotive Braking System	<i>Severin Sadjina, Lars Kyllingstad and Stian Skjong</i> Decreasing Risk in the Design of Large Coupled Systems via Co-Simulation-Based Optimization and Adaptive Stress Testing	 Danfoss AS, TLK Energy GmbH Optimized usage of heat recovery potentials in modern liquid cooled data centers to minimize their environmental impact
	<i>Christian Gutsche, Christoph Seidl, Volodymyr Prokopets, Sebastian Götz, Zizhe Wang and Uwe Assmann</i> Context-Oriented Equation-based Modeling in ModelingToolkit.jl	<i>Ao Zhang and Xiang Wang</i> Further Application of Modelica-Based Nuclear Power System Simulation: Tasks in Different Scenarios Driven by Model and Data	<i>Jonathan Brembeck, Ricardo Pinto de Castro, Johannes Ullsch, Jakob Tobolar, Christoph Winter and Kenan Ahmic</i> VDCWorkbench: A Vehicle Dynamics Control Test & Evaluation Library for Model and AI-based Control Approaches	<i>Basilio Puente Varela, Maria Dolores Fernández Ballesteros, Maria Isabel Lamas Galdo and Luis Carral</i> ShipSIM: A Modelica Library for Ship Maneuverability Modeling and Simulation	
	<i>Zizhe Wang, Christian Gutsche and Uwe Assmann</i> Context-Oriented Modelica for Advanced Variability Management	<i>Joy El Feghali, Louis Garbay, Adrien Guironnet, Philibert Parquier, Marco Chiaromello, Martin Franke and Luka Plavec</i> An Open-Source Industrial-Grade Collection of Renewable Energy Source Generic Models in Modelica Language	<i>Zhiguo Zhou, Xuehua Zhou, Lin Du, Peiquan Ma, Xiang Wang, Ying Chen, Mingjia Liu, Tengyue Wang, Lixin Hui and Cun Zeng</i> Simulation of Embodied Cyber Physical System Based on Modelica/MWORKS: A Case Study of Intelligent Unmanned Surface Vessel	<i>Boudewijn Van Groos, Alje Van Dam, Carsten von Ohlen, Finn Theel, Johannes Brunnemann and Jörg Eiden</i> Modelica driven development of the thermal management control system for a zero emission yacht	
Wed, 14:10	New Translation Methods and Tools	Fuel Cell Modeling and Control	Control Applications in Modelica	Automotive	 Model-Based Workflows and SSP
	<i>Benoît Caillaud, Albert Benveniste and Mathias Malandain</i> Benchmarking the Modular Structural Analysis Algorithm	<i>Michele Bolognese, Emanuele Martinelli, Luca Praticò and Matteo Testi</i> Dynamic modelling of an Ammonia to Power application at high efficiency using a solid oxide fuel cell system	<i>Alberto Leva</i> On the precise and efficient representation of industrial controllers in Modelica	<i>Massimo Stellato, Alberto Momesso, Theodor Ensburry and Alessandro Picarelli</i> Race Car Braking System Thermal Model for Real Time Use in a Driving Simulator	
	<i>Martin Otter and Hilding Elmqvist</i> Resizable Arrays in Object-Oriented Modeling	<i>Emanuele Martinelli, Michele Bolognese, Nirmala Nirmala, Narges Ataollahi and Matteo Testi</i> Direct Ammonia Solid Oxide Fuel Cell Stack: Modelling and Experimental Validation	<i>Rüdiger Franke, Marcin Bartosz and Rasmus Nyström</i> Master controller for offshore wind power and hybrid grids	<i>Jaewung Jung, Alessandro Picarelli, David Briant, Kadir Sahin, Garron Fish, Victor-Marie Lebrun, Christopher Stromberger, Arnaud Colleoni and Quentin Prieto</i> Development of a Multi-Physical Simulation Platform for Durability Prediction for Hyundai & Kia Electric Vehicles	
15:00	<i>Karim Abdelhak and Bernhard Bachmann</i> Constant Time Causalization using Resizable Arrays	<i>Markus Pollak, André Thüring and Wilhelm Tegethoff</i> Dynamic Simulation of a PEM Electrolysis System	<i>Reiko Müller</i> The FlightControl library for aircraft control design applications	<i>Jan Friedrich Hellmuth, Markus Pollak, Andreas Schulte, Wilhelm Tegethoff and Jürgen Köhler</i> Solid-State Battery-Systems and Thermal Management for Electric Long-Distance Buses	<i>Toshiba Digital Solutions Corporation</i> Cross-Company Collaborative Model-Based Development using FMI3.0 and SSP2.0
	<i>Hilding Elmqvist and Martin Otter</i> Mediator - A Web App for Modelica Simulation	<i>Axelle Hégo, Félix Bosio and Sylvain Mathonnière</i> Model-Based Control Design for a Multi-Stacks SOC System	<i>Tilman Bünte and Jakob Tobolář</i> Quasi-Periodic Feedforward Control Based on Inverse Model Tabled FFT		
					<i>MAN Energy Solutions</i> Neural Network-Based Reduced-Order Model of a Large-Scale CO ₂ Heat Pump for Real-Time Simulation and Digital Twin Applications

Scientific Poster Presentations

Mon, Tue, Wed, all day	<i>Markus Gillner, Jan Westphal, Béla Wiegel, Tom Steffen, Julian Urbansky, Anne Hagemeier, Stefanie Ruppert, Annika Heyer, Jörn Benthin, Tim Hanke, Johannes Brunnemann, Christian Becker and Arne Speerforck</i> Philip Hannebohm and Bernhard Bachmann Selective Evaluation of RHS during Multi-Rate Simulation	<i>Joshua Brun, Thomas Sergi, Sylvan Mutter, Tim Arnold and Ulf Christian Müller</i> From Simulation to Reality: Deployment of Reinforcement Learning-Based Neural Network Controllers Trained with Modelica Models	<i>Stefan H. Reiterer, Alexander Meierhofer, Ivan Vidovic, Marco Forberger, Benjamin Stuntner and Jochen Nowotny</i> Railway Marketplace for Data, Know-How and Services
<i>Gustavo Canon, Volodymyr Prokopets, Fabian Elizondo Arrieta, Eliécer Arias and Alexander Zeißler</i> A Thermal Digital Twin of Asphalt Pavements: Implementation and Application to an Instrumented Pavement in Costa Rica	<i>Carles Ribas Tugores, Gerald Zotter and Carina Seidnitzer-Gallien</i> Absolut Modelica library	<i>A. Phong Tran and Fatma Cansu Yücel</i> Safe and Efficient Control of a Brayton Cycle Heat Pump Using Reinforcement Learning	<i>Simon Müller, Abdulrahman Dahash, Shariq Akbar, David Schmitt, Peter Bayer and Tobias Schrag</i> Integrating a Seasonal Thermal Energy Storage FMU in a MATLAB/Simscape Thermal Source Network Model
<i>Micah Condie, Abigaile Woodbury, James Goppert and Joel Andersson</i> Rumoca: Towards a Translator from Modelica to Algebraic Modeling Languages	<i>Marcelo Muro, Guido Sassaroli and Riccardo Lazzari</i> MultiEnergySystem: A Modelica Library for Dynamic Modeling and Simulation of District Heating and Gas Networks	<i>Robert Weber, Staša Gejo, Rainer Gehring and Lars Mikelsons</i> Identification and Elimination of Instabilities During Simulation of Highly Stiff Vehicle Electrical Power System Models	<i>Alberto Romero, Johannes Angerer, Elias Steinkellner and Luca Belforte</i> A low complexity physics-based aging model for lithium ion cells with solid electrolyte interphase and lithium plating side-reactions
<i>Requirement Verification with CRML and OpenModelica</i> Requirement Verification with CRML and OpenModelica	<i>Christophe Montsarrat, Pascal Borel and Ana Paez</i> Calibration of a Chiller Modelica model with experimental data	<i>Mathieu Specklin, Elie Salai, Clémence Rouge and Michael Deligant</i> Dynamic modeling of a liquid piston compressor system including conjugate heat transfer	<i>Li Zuo, Yuanhui Dong, Shubin Zhang, Yuxin Li, Haiming Zhang, Ji Ding, Fanli Zhou, Qi Liu and Liping Chen</i> Dynamic Simulation of Off-Grid Energy Island with Wind-PV-Storage Hydrogen Production
<i>Songchen Tan, Keming Miao, Alan Edelman and Christopher Rackauckas</i> Scalable Higher-order Nonlinear Solvers via Higher-order Automatic Differentiation	<i>Pierre Blaud and Imad Mourtaji</i> A Dynamic Simulation Model of Outdoor Swimming Pool with Thermal Energy Storage, Boiler and Solar Thermal Collectors	<i>Fabian Lagerstedt, Samuel Kärnell, Marcus Rösth and Liselott Ericson</i> Modeling and Simulation of a Direct Heat Recovery System for Cabin Heating in Battery-Powered Mobile Machines	<i>Bahareh Bakhsh Zahmatkesh, Mina Shahi and Amirhoushang Mahmoudi</i> Physics-Based Dynamic Modeling of Solar-Powered Off-Grid Cold Storage for Perishables Using Modelica: A Case Study – Xingalool, Somalia