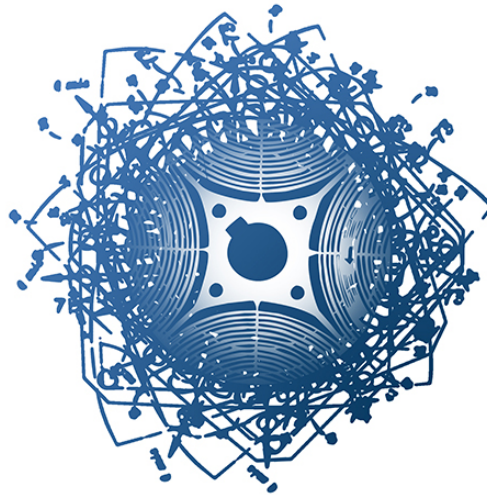


# SyR-e

## References



syre

Simone Ferrari  
simone.ferrari@polito.it

May 15, 2025

# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>List of Published Papers</b>	<b>3</b>
2.1	Journal Papers . . . . .	3
2.2	Conference Papers . . . . .	4
<b>3</b>	<b>List of Published PhD Thesis</b>	<b>8</b>

# Chapter 1

## Introduction

This document is a collection of some of the papers and PhD dissertations published along the years, during SyR-e development. In general, it is possible to access to the papers and dissertations through the IRIS portal at <https://iris.polito.it/>. The items are sorted in a time order, from the oldest to the newest.

## Chapter 2

# List of Published Papers

### 2.1 Journal Papers

- [1] F. Cupertino, G. Pellegrino and C. Gerada, “Design of Synchronous Reluctance Motors With Multiobjective Optimization Algorithms,” in *IEEE Transactions on Industry Applications*, vol. 50, no. 6, pp. 3617-3627, Nov.-Dec. 2014. Available [here](#)
- [2] G. Pellegrino, F. Cupertino and C. Gerada, “Automatic Design of Synchronous Reluctance Motors Focusing on Barrier Shape Optimization,” in *IEEE Transactions on Industry Applications*, vol. 51, no. 2, pp. 1465-1474, March-April 2015. Available [here](#)
- [3] C. Lu, S. Ferrari and G. Pellegrino, “Two Design Procedures for PM Synchronous Machines for Electric Powertrains,” in *IEEE Transactions on Transportation Electrification*, vol. 3, no. 1, pp. 98-107, March 2017. Available [here](#)
- [4] R. Leuzzi, P. Cagnetta, S. Ferrari, P. Pescetto, G. Pellegrino and F. Cupertino, “Transient Overload Characteristic of PM-Assisted Synchronous Reluctance Machines, Including Sensorless Control Feasibility,” *IEEE Transaction on Industry Application*, 2019. Available [here](#)
- [5] S. Ferrari and G. Pellegrino, “FEAfix: FEA Refinement of Design Equations for Synchronous Reluctance Machines,” *IEEE Transaction on Industry Application*, 2020. Available [here](#)
- [6] S. Ferrari, P. Ragazzo, G. Dilevrano and G. Pellegrino, “Flux and Loss Map Based Evaluation of the Efficiency Map of Synchronous Machines,” *IEEE Transaction on Industry Application*, 2022. Available [here](#)
- [7] S. Ferrari, G. Dilevrano, P. Ragazzo, P. Pescetto and G. Pellegrino, “Fast Determination of Transient Short-Circuit Current of PM Synchronous Machines Via Magnetostatic Flux Maps,” *IEEE Transaction on Industry Application*, 2023. Available [here](#)

- [8] S. Ferrari, G. Dilevrano, P. Ragazzo, G. Pellegrino and T. Burrell, “Rapid Magnetic, Thermal, and Structural Scaling of Synchronous Machines Based on Flux and Loss Maps,” in *IEEE Open Journal of Industry Applications*, 2025. Available [here](#)
- [9] S. Ferrari, L. Solimene, R. Torchio, C. Anerdi, F. Freschi, L. Giaccone, G. Lorenti, F. Lucchini, P. Alotto, G. Pellegrino and M. Repetto, “A Multiphysics Dataset Generation Procedure for the Data-Driven Modeling of Traction Electric Motors,” in *IEEE Access*, 2025. Available [here](#)

## 2.2 Conference Papers

- [1] G. Pellegrino and F. Cupertino, “FEA-based multi-objective optimization of IPM motor design including rotor losses,” *2010 IEEE Energy Conversion Congress and Exposition*, Atlanta, GA, 2010, pp. 3659-3666. Available [here](#)
- [2] G. Pellegrino and F. Cupertino, “IPM motor rotor design by means of FEA-based multi-objective optimization,” *2010 IEEE International Symposium on Industrial Electronics*, Bari, 2010, pp. 1340-1346. Available [here](#)
- [3] F. Cupertino, G. M. Pellegrino, E. Armando and C. Gerada, “A SyR and IPM machine design methodology assisted by optimization algorithms,” *2012 IEEE Energy Conversion Congress and Exposition (ECCE)*, Raleigh, NC, 2012, pp. 3686-3691. Available [here](#)
- [4] M. Palmieri, M. Perta, F. Cupertino and G. Pellegrino, “High-speed scalability of synchronous reluctance machines considering different lamination materials,” *IECON 2014 - 40th Annual Conference of the IEEE Industrial Electronics Society*, Dallas, TX, 2014, pp. 614-620. Available [here](#)
- [5] M. Gamba, G. Pellegrino and F. Cupertino, “Optimal number of rotor parameters for the automatic design of Synchronous Reluctance machines,” *2014 International Conference on Electrical Machines (ICEM)*, Berlin, 2014, pp. 1334-1340. Available [here](#)
- [6] M. Palmieri, M. Perta, F. Cupertino and G. Pellegrino, “Effect of the numbers of slots and barriers on the optimal design of synchronous reluctance machines,” *2014 International Conference on Optimization of Electrical and Electronic Equipment (OPTIM)*, Bran, 2014, pp. 260-267. Available [here](#)
- [7] C. Lu, S. Ferrari, G. Pellegrino, C. Bianchini and M. Davoli, “Parametric design method for SPM machines including rounded PM shape,” *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, OH, 2017, pp. 4309-4315. Available [here](#)
- [8] R. Leuzzi, P. Cagnetta, F. Cupertino, S. Ferrari and G. Pellegrino, “Performance assessment of ferrite- and neodymium-assisted synchronous reluctance machines,” *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, OH, 2017, pp. 3958-3965. Available [here](#)

- [9] M. Gamba, G. Pellegrino, E. Armando and S. Ferrari, “Synchronous reluctance motor with concentrated windings for IE4 efficiency,” *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, OH, 2017, pp. 3905-3912. Available [here](#)
- [10] S. Ferrari, G. Pellegrino, M. Davoli and C. Bianchini, “Reduction of Torque Ripple in Synchronous Reluctance Machines through Flux Barrier Shift,” *2018 XIII International Conference on Electrical Machines (ICEM)*, Alexandroupoli, 2018, pp. 2290-2296. Available [here](#)
- [11] S. Ferrari and G. Pellegrino, “FEA-Augmented Design Equations for Synchronous Reluctance Machines,” *2018 IEEE Energy Conversion Congress and Exposition (ECCE)*, Portland, OR, 2018, pp. 5395-5402. Available [here](#)
- [12] S. Ferrari, G. Pellegrino, M. Z. M. Jaffar and I. Husain, “Computationally Efficient Design Procedure for Single-Layer IPM Machines,” *2019 IEEE International Electric Machines and Drives Conference (IEMDC)*, San Diego, CA, 2019. Available [here](#)
- [13] S. Ferrari and G. Pellegrino, “Torque Ripple Minimization of PM-assisted Synchronous Reluctance Machines via Asymmetric Rotor Poles,” *2019 IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, MD, 2019. Available [here](#)
- [14] P. Ragazzo, S. Ferrari, N. Rivière, M. Popescu and G. Pellegrino, “Efficient Multiphysics Design Workflow of Synchronous Reluctance Motors,” *2020 XIV International Conference on Electrical Machines (ICEM)*, Goteborg, 2020. Available [here](#)
- [15] S. Ferrari, P. Ragazzo, G. Dilevrano and G. Pellegrino, “Flux-Map Based FEA Evaluation of Synchronous Machine Efficiency Maps,” *2021 IEEE Workshop on Electrical Machine Design, Control and Diagnosis (WEMDCD)*, Modena (Italy). Available [here](#)
- [16] A. Varatharajan, D. Brunelli, S. Ferrari, P. Pescetto and G. Pellegrino, “syreDrive: Automated Sensorless Control Code Generation for Synchronous Reluctance Motor Drives,” *2021 IEEE Workshop on Electrical Machine Design, Control and Diagnosis (WEMDCD)*, Modena (Italy). Available [here](#)
- [17] S. Ferrari, G. Dilevrano, P. Ragazzo and G. Pellegrino, “The dq-theta Flux Map Model of Synchronous Machines,” *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver. Available [here](#)
- [18] S. Ferrari, P. Ragazzo, G. Dilevrano and G. Pellegrino, “Determination of the Symmetric Short-Circuit Currents of Synchronous Permanent Magnet Machines Using Magnetostatic Flux Maps,” *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver. Available [here](#)

- [19] P. Ragazzo, G. Dilevrano, S. Ferrari and G. Pellegrino, “Design of IPM Synchronous Machines Using Fast-FEA Corrected Design Equations,” *2022 XV International Conference on Electrical Machines (ICEM)*, Valencia, 2022. Available [here](#)
- [20] G. Dilevrano, P. Ragazzo, S. Ferrari, G. Pellegrino and T. Burrell, “Magnetic, Thermal and Structural Scaling of Synchronous Machines,” *2022 IEEE Energy Conversion Congress and Expo (ECCE)*, Detroit, MI, 2022. Available [here](#)
- [21] J. Binder, M. Silvagni, S. Ferrari, B. Deusinger, A. Tonoli and G. Pellegrino, “High-speed IPM Motors with Rotor Sleeve: Structural Design and Performance Evaluation,” *2023 IEEE Workshop on Electrical Machine Design, Control and Diagnosis (WEMDCD)*, Newcastle Upon Tyne, UK, 2023. Available [here](#)
- [22] P. Ragazzo, S. Ferrari, G. Dilevrano, L. Beatrice, C. Girardi and G. Pellegrino, “Scaling of Ferrite-assisted Synchronous Reluctance Machines for Lifting Systems,” *2023 IEEE Workshop on Electrical Machine Design, Control and Diagnosis (WEMDCD)*, Newcastle Upon Tyne, UK, 2023. Available [here](#)
- [23] A. Bojoi, S. Ferrari, P. Pescetto and G. Pellegrino, “Advanced Circuit Model for e-Drive Simulation, Including Harmonic Effects and Fault Scenarios,” *2023 PCIM Europe*, Nuremberg, D, 2023. Available [here](#)
- [24] P. Ragazzo, S. Ferrari, G. Dilevrano, L. Beatrice, C. Girardi and G. Pellegrino, “Synchronous Reluctance Machines with and without Ferrite Assistance for Lifting Systems,” *2023 IEEE International Electric Machines and Drives Conference (IEMDC)*, San Francisco, CA, 2023. Available [here](#)
- [25] G. Dilevrano, P. Ragazzo, S. Ferrari and G. Pellegrino, “Comparative Design of Ferrite- and NdFeB- PMSMs using the (x,b) Design Plane,” *2023 IEEE International Electric Machines and Drives Conference (IEMDC)*, San Francisco, CA, 2023. Available [here](#)
- [26] P. Ragazzo, G. Dilevrano, S. Ferrari and G. Pellegrino, “Comparative Turn-off Safe Modes of Ferrite- and NdFeB- Interior PMSM,” *2023 IEEE Energy Conversion Congress and Expo (ECCE)*, Nashville, TN, 2023. Available [here](#)
- [27] P. Ragazzo, G. Dilevrano, S. Ferrari and G. Pellegrino, “Fast and Accurate Iron Loss Evaluation Using Static FEA for Traction PMSMs,” *2024 IEEE International Conference on Industrial Technology (ICIT)*, Bristol, UK, 2024. Available [here](#)
- [28] P. Ragazzo, G. Dilevrano, S. Ferrari and G. Pellegrino, “Magnet Loss Computation for PMSMs Under PWM Supply via Corrected Magnetostatic FEA,” *2024 IEEE International Conference on Industrial Technology (ICIT)*, Bristol, UK, 2024. Available [here](#)

- [29] P. Ragazzo, G. Dilevrano, A. Bojoi, S. Ferrari and G. Pellegrino, "Fast Efficiency Mapping Procedure for PMSM Accounting for the PWM Supply Impact," *2024 IEEE International Conference on Industrial Technology (ICIT)*, Bristol, UK, 2024. Available [here](#)
- [30] L. Solimene, S. Ferrari, C. Anerdi, F. Freschi, L. Giaccone, G. Lorenti, F. Lucchini, R. Torchio, P. Alotto, G. Pellegrino and M. Repetto, "Data-Driven Approaches for Electromagnetic Analysis of Traction Electrical Motors: A Proposal for a Benchmark Problem," *2024 International Conference on Electrical Machines (ICEM)*, Torino, Italy, 2024. Available at [here](#)
- [31] S. Ferrari, G. Dilevrano, K. Bergsro, T. Bertoncello and G. Pellegrino, "Performance Assessment of Ferrite-Assisted Synchronous Reluctance Motors for Traction Applications," *2024 International Conference on Electrical Machines (ICEM)*, Torino, Italy, 2024. Available at [here](#)
- [32] A. Bojoi, P. Pescetto, S. Ferrari and G. Pellegrino, "Experimental Identification of the  $dq\theta$  Flux Maps of Synchronous Machines," *2024 International Conference on Electrical Machines (ICEM)*, Torino, Italy, 2024
- [33] R. Acquaviva, S. Ferrari, M. Silvagni, A. Tonoli and G. Pellegrino, "Design Comparison of Wrapped and non-Wrapped Interior Permanent Magnet Synchronous Machines," *2024 International Conference on Electrical Machines (ICEM)*, Torino, Italy, 2024. Available [here](#)
- [34] S. Ferrari, L. Ciravegna, G. De Donno, E. Galvagno, M. Iannone and G. Pellegrino, "Comparison of e-NVH Performance of Different PMSMs in Electric Vehicle Powertrain," *2024 International Conference on Electrical Machines (ICEM)*, Torino, Italy, 2024. Available [here](#)
- [35] S. Ferrari, A. Bojoi, M. Mirazimi, P. Pescetto, D. Ronchetto, P. Cagnetta and G. Pellegrino, "Symmetric Short-Circuit Model of Synchronous Machines based on Flux and Loss Maps," *2024 IEEE Energy Conversion Congress and Exposition (ECCE)*, Phoenix, AZ, USA, 2024. Available [here](#)
- [36] S. Ferrari, S. Rubino, F. Mandrile, A. Bojoi, E. Armando and G. Pellegrino, "Performance Derating of Multi-Three-Phase PM-Assisted Synchronous Reluctance Motors in Open-Three-Phase Fault Condition," *2024 IEEE Energy Conversion Congress and Exposition (ECCE)*, Phoenix, AZ, USA, 2024. Available [here](#)



## Chapter 3

### List of Published PhD Thesis

- [1] M. Gamba, “Design of non conventional Synchronous Reluctance machines”, Politecnico di Torino, 2017. Available [here](#)
- [2] C. Lu, “Design methods for Surface-Mounted Permanent Magnet Synchronous Machines”, Politecnico di Torino, 2018. Available [here](#)
- [3] S. Ferrari, “Design, Analysis and Testing Procedures for Synchronous Reluctance and Permanent Magnet Machines”, Politecnico di Torino, 2020. Available [here](#)
- [4] P. Ragazzo, “Advanced Modelling and Design Methodology for Electric Traction Motors”, Politecnico di Torino, 2024. Available [here](#)
- [5] G. Dilevrano, “Design and Testing of e-Motors for Transportation”, Politecnico di Torino, 2024. Available at [here](#)