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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
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- [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 Trans*action 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



2.2 Conference Papers

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- [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
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- [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 ssisted synchronous reluctance machines," 2017 IEEE Energy Conversion Congress and Exposition (ECCE), Cincinnati, OH, 2017, pp. 3958-3965. Available here
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- [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
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- [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. Beatrici, 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 Circuital Model for e-Drive Simulation, Including Harmonic Effects and Fault Scenarios," 2023 PCIM Europe, Nuremberg, D, 2023. Available here
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- [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
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- [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



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
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