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A Comprehensive Review of SRM Motor Challenges and Control Methods in Electric Vehicle Applications

J. R. Sawant[1], A. S. Telang[2], D. A. Shahakar[3], P.M. Pandit[4] and J. B. Fulzele[5]
[1]Department of Electrical Engineering, JDIET, Yavatmal, India
Email: jitusawant134@gmail.com,
[2-3]Dept. of Electrical Engineering, PRPCOEM, Amarawati, India
Email: astelang@prpotepatilengg.ac.in, deepakshahakar@gmail.com
[4]Department of Electronics & Tel. Engineering, JDIET, Yavatmal, India.
Email: pankajpandit1972@gmail.com
[5]Department of Electrical Engineering, JDIET, Yavatmal, India.
Email: jyoti_fulzele@jdiet.ac.in

***Abstract*— Switched Reluctance Motors are increasingly gaining popularity in electric vehicle applications due to their simple design, robust performance, and high efficiency across a wide speed range. Despite these advantages, SRMs face several significant barriers to widespread adoption, including high torque ripple, acoustic noise, and complex control requirements. These challenges not only affect the driving experience but also raise concerns about the overall reliability and efficiency of EV systems. This paper presents a comprehensive review of the critical challenges associated with SRM motors in EVs, with particular emphasis on torque ripple mitigation, noise reduction, and thermal management. It thoroughly explores various control strategies developed to address these issues, ranging from conventional methods such as current profiling and Direct Torque Control to advanced techniques involving machine learning-based optimization and hybrid control systems. Furthermore, the paper highlights recent advancements in SRM design and control, offering insights into how these developments can enhance motor performance and increase the practical viability of SRM technology in electric vehicles. By synthesizing prior research and identifying key areas for future exploration, this review aims to support ongoing efforts to overcome the limitations of SRM motors in EV applications.**

***Keywords*— Switched Reluctance Motor, Electric Vehicles, Torque Ripple Reduction, Control Strategies, Acoustic Noise Mitigation.**

I. INTRODUCTION

The transition to electric vehicles is accelerating, driven by the global push towards sustainable transportation and the need to reduce dependence on fossil fuels. In this context, the selection of suitable electric motor technologies plays a pivotal role in achieving efficient, reliable, and cost-effective electric propulsion systems. Switched Reluctance Motors have emerged as a promising candidate for EV applications due to their simple structure, ruggedness, and ability to operate over a wide speed range. However, despite their inherent advantages, SRMs face several challenges that hinder their widespread adoption in the EV industry [4].

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One of the main issues with SRMs is torque ripple, a phenomenon caused by the motor's discrete torque production, leading to vibrations, noise, and reduced driving comfort. Additionally, SRMs are known for high acoustic noise and electromagnetic interference, further complicating their integration into EVs. These drawbacks arise primarily from the unique operation principles of SRMs, including their non-linear magnetic characteristics and dependence on precise rotor position information. Addressing these issues is crucial for optimizing SRM performance in terms of efficiency, noise reduction, and overall driving experience[4,6].
To overcome these challenges, various control methods have been developed and refined, aimed at enhancing the performance of SRMs in electric vehicles. Techniques such as Indirect Torque Control , Direct Torque Control, and advanced current profiling are commonly employed to minimize torque ripple and improve the smoothness of motor operation. Additionally, advancements in sensor technologies and sophisticated control algorithms, including model predictive control and artificial intelligence-based methods, have shown promise in tackling SRM-related limitations.This comprehensive review focuses on analyzing the critical challenges associated with SRM motors in EV applications, with an emphasis on torque ripple, noise, and control complexity. It also examines the state-of-the-art control strategies designed to mitigate these issues, providing insights into their effectiveness and practical implementation in real-world scenarios. By synthesizing recent research and development trends, this review aims to guide future work towards achieving more efficient and commercially viable SRM-based EV solutions.

II. Motivation and Objective

The motivation behind this comprehensive review is driven by the growing demand for efficient and reliable electric propulsion systems in the electric vehicle industry, where Switched Reluctance Motors have emerged as a promising alternative due to their simple construction, cost-effectiveness, and avoidance of rare earth materials. Despite these advantages, SRMs face critical challenges such as torque ripple, acoustic noise, and electromagnetic interference, which hinder their widespread adoption. The objective of this review is to systematically analyze these challenges and evaluate the effectiveness of existing and emerging control methods such as Indirect Torque Control, Direct Torque Control, advanced current profiling, and AI-based approaches in overcoming these limitations. By examining recent advancements and identifying areas for future research, the review aims to provide insights that will facilitate the development of more efficient and commercially viable SRM-based propulsion systems, supporting the broader transition to sustainable electric mobility.

III. Overview of SRM Technology

The stator and rotor are two key components of asynchronous motors . The stator is a stationary part made of laminated steel, with segmented windings that create a rotating magnetic field. The rotor, on the other hand, is made of laminated steel but lacks windings or permanent magnets. It rotates in response to the changing magnetic fields from the stator windings, relying on the principle of reluctance torque. Each winding is independently controlled, creating a magnetic field and pulling the nearest rotor pole towards alignment.

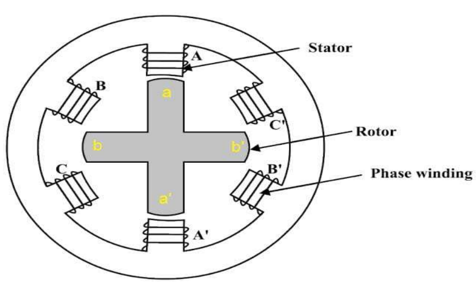

Figure 3. Stator and Rotor structure [3]

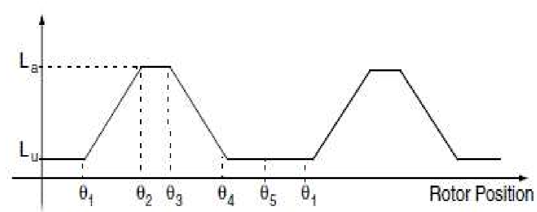

Figure 2. Inductance profile.[5]

This motor works on the principle of variable reluctance. This means, the rotor always tries to align along the lowest reluctance path. As we know that magnetic flux have a tendency to flow through lowest reluctance path, therefore rotor always tends to align along the minimum reluctance path. When a stator phase is magnetized, a closed magnetic field is generated between the stator, the air gap and the rotor.
This magnetic field tends to minimize the reluctance by reducing the air gap which creates a rotor movement. When a stator pole is aligned with a rotor pole, it is said that they are in the position of minimum reluctance, and when they are completely unaligned, it is said they are in the position of maximum reluctance. This characteristic

of the motor makes it possible to create a rotational movement of the rotor by magnetizing and demagnetizing each phase in the right position of the rotor.
SRM mathematical model for analyzing and calculating these attributes.
The formulas for voltage and flux linkage are provided below:

$$V = I R + \frac{d\lambda (i,\theta)}{dt} \quad (1)$$

$$\lambda (I, \theta) = \int (V - I R) \ dt \quad (2)$$

Where, V is phase voltage , I is phase current, θ is rotor position , λ is flux linkage, R is winding resistance per phase

$$(I , \theta) = I * L (I , \theta) \quad (3)$$

The torque is calculated by replacing the flux linkage expression from Eq. 3 with Eq. 1, where L is phase inductance. This results in:

$$T = \frac{1}{2} I^2 \ d L(I , \theta) / dt \quad (4)$$

Where, T is Electromagnetic torque produced by the motor, I **is** Current flowing through the motor winding, θ **is** Rotor position in electrical degrees or radians

TABLE I: COMPARATIVE REVIEW OF SRM WITH ADVANTAGES AND DISADVANTAGES OF DIFFERENT APPROACHES IN EV APPLICATIONS

Author Citation []	Methods Adopted	Advantages	Disadvantages
Yue Ying Zhu *et.al.* [1], 2014	Nonlinear dynamic model of SRM drive	• SRM output power peaks at 2500r/min, then decreases. • Equivalent power coefficient improves with speed increase in SRM.	• Constant load equivalent power curve limitations highlighted. • Overload performance and slow speed torque limitations discussed.
Jhumar Lal Beniwal *et al.* [2], 2014	New and low-cost converter configuration	• Increased speed of response with five-phase SRM drive. • Reduction in torque ripple and faster dynamic response observed.	• Large torque ripple, acoustic noise, vibration • Independent operation not possible with three-phase excitation
Kai-Wei Hu, Pei-Hsun Yi *et al.* [3],2015	Single-phase two-stage switch-mode rectifier- based charger	• Good acceleration/deceleration, reversible driving, and braking characteristics achieved. • Functions include G2V charging, V2H discharging, and V2G discharging modes.	• Control and setting of key parameters for motor drive performance • Differential mode and common mode control schemes for output voltages is required
K. T. Chau *et al.* [4] ,2015	Torque-ripple minimization control.	• The paper discusses the system configurations, machines, converters, and control strategies of SR motor drives. • It provides design criteria, examples, and applications for EV propulsion.	• Need for torque-ripple minimization control discussed • Relatively large torque ripples •
Aarim C. Sijini *et al.* [5],2016	Nonlinear controller	• Nonlinear controller reduces torque and speed ripple for HEV suitability. • Simulation of SRM for HEV using MATLAB Simulink model.	• Torque ripple, acoustic noise, and speed ripple • Nonlinear nature of SRM operating in saturation
N. Zabihi *et al.* [6] ,2016	Review of SRM structures	• Reviews SRM structures, advantages, disadvantages, and control strategies. • Studies various SRM topologies, merits, limits, and challenges in torque	• SRM structures, advantages, disadvantages reviewed. • Various SRM topologies studied with merits and limits.
Cheng He, Chen Hao *et al.* [7] ,2016	FA-CCC in constant torque area & AVA-CCC in constant power area	• FA-CCC in constant torque area, AVA-CCC in constant power area. • Simulation analysis and experiment test results demonstrate control strategy performance.	• Starting torque, speed range, and reliability for electric vehicles. • Control strategies for constant torque and power speed range widening.
Hitoshi Miyata *et al.* [8] , 2017	Constant-current power Converter	• Novel motor reduces noise, vibration, and torque ripple. • Constant current power supply successfully controlled and tested.	• Torque ripple, noise, nonlinear characteristics • Inability to control each phase winding independently

Yan-yang Wang *et al.* [9],2017	Parameter sensitivity analysis	• SRM parameters have different effects on IWM-EV performance. • Vehicle dynamics impacted by stator mass, rotor mass, and more.	• SRM vertical force and air gap deformation affect vehicle safety. • SRM representative parameters have different and coupling effects on performance.
M.B. Saifee *et al.* [10] , 2017	Discrete time PI controller for speed tracking and control.	• Drive efficiency: 88.03% with regenerative braking. • Speed control: Rise time of 7 sec, steady state error 0.22%.	• Current interference with three half bridges • Lack of in-built Hall sensors in PSIM model
Taketo Tomioka et al. [11], 2018	PMSM and SRM.	• SRM volume reduced by 53% compared to conventional PMSM. • Proposed SRM achieves 1% higher efficiency than conventional SRM.	• Downsizing while maintaining high output power • Achieving high efficiency in high-speed SRM motors
Chun Gan et al. [12] ,2018	Machine topology	• Analysis of radial vibration and torque ripples in SRMs • Review of machine topology improvement and control strategies	• Torque ripple and radial distortion causing noise and vibration • Need to optimize SRM system to overcome drawbacks
S. Hariharan et al. [13] ,2018	SRM motor - RS converter	• Reduced Switch (RS) converter yields positive torque current. • RS converter reduces power losses in SR motor drive system.	• Conventional SR motors driven by asymmetrical bridge converter with power loss. • Reduced power losses achieved with Reduced Switch (RS) converter.
V. Vasan Prabhu et al. [14],2019	Controller modeling using MATLAB software	• Integral approach for SR machine design using Magnet software. • Controller modelling in MATLAB for improved performance in electric vehicles.	• FEM method not sufficient for special electrical machines modeling. • Nonmagnetic SR machine suitability high for EV applications compared to PM motor.
Srinivasan Kandhasamy et al. [15],2020	Dynamic limiter based on speed and torque error for real-time control.	• Novel approach proposed for reducing torque ripple in SRM control. • Machine-learning model implemented on Xilinx Zynq-Ultrascale SoC FPGA.	• Non-linear characteristics of SRM • Inherent torque ripple affecting drivability, dynamics, acoustics
Debjani Goswamiet al. [16],2022	Design parameters dimensioning and primary drawing using AutoCAD software	• SRM design tested for torque ripple, power losses, and efficiency. • Results compared with equivalent PMSM for performance, reliability, cost.	• Magnet high costs, limited availability, demagnetization, extraction issues • Iron losses, instability at high speeds, torque ripple, acoustic noise
V. P. Abhijith et al. [17],2022	Experiments to verify proof of concept and software analysis method	• New motor suitable for EVs due to high torque, dependability. • Ansys/2D Maxwell's FEM used for numerical analysis.	• HESRM technique with PM results in unfavorable difficulties. • New motor is well-suited for EVs due to high dependability.
Karthika M et al. [18] ,2022	Finite Element Analysis (FEA) based software	• Higher pole configuration provides better torque, less ripple, improved efficiency. • 8/6, 8/10, 8/14, 12/8, 12/10, 12/16 SRM topologies compared.	• Enhancing torque, reducing ripple, improving efficiency for EV applications. • Comparing different SRM topologies for electric three-wheeler vehicles.
Sunil V. Patil et al. [19],2023	Experimental tests - SRM.	• T-I characteristics of SRM in simulation and experimentation are comparable. • Results of simulation and experimentation for SRM performance are validated.	• SRM performance simulation validation through experimental results • Comparison of T-I characteristics in simulation and experimentation
A. Ouannou et al., [20],2023	Development of a new SRM model using an analytical technique	• New SRM model estimation using analytical technique • Highlighted effectiveness through numerical simulations in MATLAB/SIMULINK	• Nonlinear behavior of SRMs • Magnetic saturated operating mode for energy transfer

B.V.Anjaneya Reddy *et al.* [21],2023	Examination of various operational parameters such as temperature, torque, speed	• Analysis of SRM performance with various converter topologies. • Development of appropriate driver system for ANSYS Simplorer simulation.	• Managing switching angles and current magnitude effectively is challenging. • Control of SRMs requires advanced control techniques for improved performance.
Prajwal S Magadi *et al.* [22],2023	Developed accurate SRM model using experimentally obtained flux-linkage characteristics	• Developed accurate SRM model using experimentally obtained flux-linkage characteristics. • Implemented closed-loop control using PID and Hysteresis current control.	• Higher torque ripple causing noise • Linear model may fail due to non-linear flux-linkage characteristics
Linh Dinh Hai *et al.* [23],2023	Finite element approach	• Investigated magnetic flux density, electromagnetic torque, output power, efficiency. • Developed method with different stator and rotor pole angles.	• Challenges in constant torque, high acoustic noise, torque ripple • High levels of vibrations mentioned as limitations
V. P. Abhijith *et al.* [24],2023	Hybrid excited non-permanent magnet-assisted topologies	• Hybrid excited SRMs outperform existing ones in torque performance. • New topologies designed for EV applications with fault tolerance.	• High torque performance without rare-earth elements • Improved electromagnetic torque throughout all speed ranges
Vijina Abhijith *et al.* [25],2023	Investigated using 2D finite element approach (2D-FEM)	• SHESRM has maximum average torque in wide speed range. • Proposed motor shows high fault tolerance and reliability for traction	• Enhancing torque without using permanent magnets • Investigating static and dynamic characteristics using 2D-FEM
Muhammed A *et al.* [26],2023	Detailed study and comparison of electric motor performance	• Analysis of SRMs, advantages, disadvantages, applications, control strategies. • Torque-speed and power speed profile graphical representations discussed.	• High acoustic noise levels • Significant friction and windage losses at high speeds
Karthikeyan Balasubramaniam *et al.* [27], 2024	Hysteresis current controllers for reducing torque ripples	• Torque ripples of SRM reduced using hysteresis current controller. • Improved performance of SRMs shown through MATLAB/Simulink simulations.	• Torque ripples in Switched Reluctance Motors (SRMs) • Reduction of greenhouse gas emissions with electric vehicles
Wei-Kai Gu *et al.* [28],2024	Bidirectional switch mode rectifier for grid-to-vehicle charging operation	• Improved driving performance and reduced battery energy consumption. • Effective regenerative braking energy recovery and interconnected grid operations.	• Fault tolerance in boost/buck converter • Good line drawn power quality and galvanic isolation preserved
Parth Upadhyay, R. K *et al.* [29],2024	Design and simulation of a two-phase SRM	• Two-phase SRM shows higher torque density than three-phase SRM. • Two-phase SRM suitable for two-wheel electric vehicle application	• Torque-density challenge in lower-speed region for SRM. • Space constraint for accommodating hub-motor in two-wheel electric vehicle.
N.Kumarasabapathy *et al.* [30],2024	Grey Wolf Optimization (GWO) based PI controller	• GWO-based PI controller optimized SRM for better EV performance. • Utilized n+1 semiconductor and diode topology for regulated DC voltage	• Growing concerns about permanent magnet machines • Technical trend towards employing Switched Reluctance Motors (SRMs)

TABLE II: CHALLENGES AND CONTROL METHODS IN SRM MOTOR APPLICATIONS FOR EVS

Challenges in SRM Motor Applications for EVs	Control Methods for SRMs in EVs
High Torque Ripple	• Direct Torque Control (DTC): Adjusts the motor torque directly to reduce ripple. • Torque Sharing Function (TSF): Smooths torque distribution among phases. • Hysteresis Current Control: Limits current deviations to reduce torque ripple.
Acoustic Noise and Vibration	• Active Noise Control (ANC): Uses feedback control to counteract noise. • Phase Current Profiling: Optimizes current waveforms to minimize noise and vibrations. • Frequency-based Noise Reduction: Alters switching frequencies to avoid resonance.

Complex Nonlinear Magnetic Characteristics	• Adaptive Control: Adjusts control parameters based on real-time conditions. • Flux-linkage-based Control: Models nonlinearities for more accurate control. • Nonlinear Model Predictive Control (NMPC): Predicts future behavior considering nonlinearities.
High Speed Operation and Demagnetization Risk	• Field-Weakening Control: Reduces flux for extended speed range operation. • Voltage Control Strategies: Maintain voltage within safe limits to avoid demagnetization. • Speed-adaptive Controllers: Dynamically adjust parameters for high-speed conditions.
Current Sensing and Control Accuracy	• Sensorless Control Techniques: Estimate motor parameters without physical sensors. • High-Resolution Encoders: Improve the accuracy of speed and position feedback. • Kalman Filter-based Observers: Filter measurement noise for accurate control.
Efficiency Optimization Under Various Load Conditions	• Optimal Current Control (OCC): Determines optimal current for a given torque to improve efficiency. • Maximum Torque Per Ampere (MTPA): Achieves the highest possible torque for a given current level. • Energy-efficient Scheduling: Adjusts control strategies based on load.
Thermal Management Issues	• Thermal Monitoring and Feedback Control: Adjusts operation to avoid overheating. • Predictive Thermal Management: Uses predictive models to adjust current and speed based on temperature forecasts. • Liquid Cooling Techniques: Incorporates control of the cooling system to manage heat.

IV. CONCLUSION

Switched Reluctance Motors hold significant promise for electric vehicle applications due to their simple construction, high-speed capability, and cost-effective operation. However, their widespread adoption remains limited by persistent challenges such as torque ripple, acoustic noise, and complex control requirements. This review has systematically examined these critical issues and evaluated a wide range of control strategies developed to address them, from conventional methods like Direct Torque Control and current profiling to advanced solutions incorporating machine learning and hybrid control systems.The analysis reveals that although substantial progress has been made in enhancing SRM performance, no single approach fully addresses all inherent limitations. Therefore, future research should focus on integrated methodologies that combine innovative control algorithms with optimized motor design, advanced signal processing, and real-time adaptive control. Additionally, emerging technologies such as artificial intelligence and predictive analytics offer new opportunities to further improve the performance, reliability, and energy efficiency of SRM drives in EVs. By consolidating existing knowledge and identifying gaps in current approaches, this review aims to support the development of next-generation SRM-based drive systems, ultimately contributing to more sustainable and efficient electric mobility solutions.

REFERENCES

[1] Y. Y. Zhu and J. F. Mou, "Modeling and performance analysis of switched reluctance motor in electric vehicles," Feb. 1, 2014.

[2] J. L. Beniwal and R. K. Tripathi, "Speed control of SRM drives using a new power converter configuration in electric vehicles," in Proc. Australasian Universities Power Engineering Conf. (AUPEC), Sep. 2014, pp. 1–6.

[3] K.-W. Hu, P.-H. Yi, and C.-M. Liaw, "An EV SRM drive powered by battery/supercapacitor with G2V and V2H/V2G capabilities," IEEE Trans. Ind. Electron., vol. 62, no. 8, pp. 4714–4727, Aug. 2015.

[4] K. T. Chau, Switched Reluctance Motor Drives. IntechOpen, May 29, 2015.

[5] A. C. Sijini, E. Fantin, and L. P. Ranjith, "Switched reluctance motor drives for hybrid electric vehicles," Jan. 1, 2016.

[6] N. Zabihi and R. Gouws, "A review on switched reluctance machines for electric vehicles," in Proc. IEEE Int.Symp.Ind. Electron. (ISIE), vol. 49, Jun. 2016, pp. 799–804.

[7] C. He, C. Hao, W. Qianlong, X. Shaohui, and Y. Shunyao, "Design and control of switched reluctance motor drive for electric vehicles," in Proc. 14th Int. Conf. Control, Automation, Robotics and Vision (ICARCV), Nov. 2016, pp.1–6.

[8] H. Miyata and E. Gonda, "Study on a motor driver for an improved SRM by using constant current power supply," Feb. 22, 2017.

[9] Y.-y. Wang and F.-n. Yang, "SRM representative parameters effect on in-wheel motored vehicle performance," Sep.1, 2017.

[10] M. B. Saifee, M. U. Javed, M. Sohaib, and N. A. Zaffar, “PSIM modelling and hall sensors based adaptive control of switched reluctance motor drive for EV applications,” in Proc. IECON 2017 - 43rd Annu. Conf. IEEE Ind. Electron. Soc., Oct. 2017, pp. 2133–2137.
[11] T. Tomioka and K. Akatsu, “Study of high-speed SRM with amorphous steel sheet for EV,” in Proc. 22nd Int.Conf. Electr. Machines and Syst. (ICEMS), Aug. 2019, pp. 1–6.
[12] C. Gan et al., “A review on machine topologies and control techniques for low-noise switched reluctance motors in electric vehicle applications,” IEEE Access, vol. 6, pp. 31430–31443, 2018.
[13] S. Hariharan and A. K. N., “SRM based efficient drive system for EV/HEV applications,” in Proc. 4th Int. Conf.Convergence in Technol. (I2CT), vol. 56, Oct. 2018, pp. 1–4.
[14] V. V. Prabhu, P. Aruna, and P. Velmurugan, “Design and implementation of switched reluctance machine based electric vehicle,” in Proc. 2nd Int. Conf. Power and Embedded Drive Control (ICPEDC), vol. 4, Aug. 2019, pp.158–166.
[15] S. Kandhasamy, “Machine learning based SRM control using FPGAs for torque ripple minimization,” in Proc. Int. Conf. Artif. Intell. Inf. Commun. (ICAIIC), vol. 1, Feb. 2020, pp. 675–680.
[16] D. Goswami and J. R. Sodre, “Design of high-performance three-phase switched reluctance motor for hybrid electric vehicle application,” in Proc. Int. Conf. Electr., Comput. and Energy Technol. (ICECET), vol. 23, Jul.2022, pp. 1–6.
[17] V. Abhijith et al., “A hybrid excited switched reluctance motor for torque enhancement without permanent magnet behavior in electric vehicle applications,” in Proc. IEEE 10th Power India Int. Conf. (PIICON), vol. 10, Nov. 2022, pp. 1–5.
[18] K. M, B. M, and K. V, “Performance analysis of SRM topologies for electric three wheeler vehicle application,” in Proc. IEEE Int. Conf. Power and Energy (PECon), Dec. 2022, pp. 493–498.
[19] S. V. Patil and R. Saxena, “SR motor T-I characteristics performance simulation validation through experimental results,” Cybern. Syst., pp. 1–14, Jan. 20, 2023.
[20] A. Ouannou et al., “Parameter identification of switched reluctance motor SRM using exponential swept-sine signal,” Machines, vol. 11, no. 6, p. 625, Jun. 5, 2023.
[21] B. V. A. Reddy et al., “Analysis of switched reluctance motor drives using ANSYS Simplorer,” in Proc. Int. Conf. Circuit Power and Comput. Technol. (ICCPCT), Aug. 2023, pp. 584–591.
[22] P. S. Magadi, S. Kalligudd, and A. B. Raju, “Non-linear modelling of switched reluctance motor and its drive for EV applications,” in Proc. 7th Int. Conf. Comput. Syst. and Inf. Technol. for Sustainable Solutions (CSITSS), vol. 80, Nov. 2023, pp. 1–6.
[23] L. D. Hai, H. N. T. Minh, D. M. N. Huu, D. B. Minh, and V. Dang Quoc, “Performance analysis of SRM with different rotor and stator pole angles of 12/8 and 12/16 configurations,” Nov. 13, 2023.
[24] V. Abhijith et al., “Hybrid switched reluctance motors for electric vehicle applications with high torque capability without permanent magnet,” Energies, vol. 15, no. 21, p. 7931, Oct. 26, 2023.
[25] V. Abhijith et al., “High torque capability segmented hybrid excited switched reluctance motor for electric vehicle applications,” in Proc. IEEE Int. Conf. Energy Technol. for Future Grids (ETFG), Dec. 2023, pp. 1–6.
[26] M. A. İbrahim and A. N. B. Alsammak, “Switched reluctance motor drive challenges - A review,” Dec. 18, 2023.
[27] K. Balasubramaniam, “SRM drive for electric vehicles with solar PV-powered and hysteresis current controlle based minimization of torque ripple,” Jan. 1, 2024.
[28] W.-K. Gu, C.-W. Yang, and C.-M. Liaw, “An EV SRM drive and its interconnected operations integrated into grid, microgrid, and vehicle,” Appl. Sci., vol. 14, no. 7, p. 3032, Apr. 4, 2024.
[29] P. Upadhyay and R. K., “Design of two-phase switched reluctance motor (SRM) for two-wheel electric vehicle and torque-density based comparison with three-phase SRM,” IEEE Trans. Ind. Appl., vol. 60, no. 3, pp. 391-3919, May 2024.
[30] N. Kumarasabapathy, K. S. Kavin, K. Sakthidhasan, and G. W. Martin, “Optimized speed and current controller based high speed switched reluctance motor for EV applications,” Futuristic Trends in Electrical Engineering, vol.3, bk. 1, Selfypage Developers Pvt Ltd, pp. 53–68, Jun. 3, 2024.