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NOMENCLATURE

Abbreviations	Designation
FL2SMC	Fuzzy Logic Type-2 sliding mode Controller
SMC	sliding mode control
IM	Induction Motor
ds-qs	Stationary reference frame direct and quadrature axes

Type-2 FLC	type-2 Fuzzy Logic Controllers
PWM	Pulse Width Modulation
RFL2	Regulator Fuzzy Logic type-2
Vs	Stator voltage
Is, Ir	Stator and rotor current
Ls, Lr, Lm	Stator, rotor and mutual inductance
Ω_r	the rotor angular speed
Ce	Electromagnetic torque
Φ_s, Φ_r	Stator and rotor flux
Rs, Rr	Stator and rotor resistances
Θ_s	Angle between stator and rotor flux
p	Number of pole pairs

APPENDIX

The parameters of the machine used for simulation are listed below [13]:

Resistance of stator and rotor $R_s=7.58\Omega, R_r=6.3\Omega$	50(Hz) Stator frequency
$N_s=160$ Number of turns per stator phase	$N_r=16$ Number of rotor bars
$J=0.0054(Kgm^2)$ Inertia	$p=2$ Poles number
$R_b=0.00015(\Omega)$ Resistance of a rotor bar	$R_e=0.00015(\Omega)$ Resistance of end ring segment
$L_e=0.1e-6(H)$ Leakage inductance of end ring	$L_b=0.1e-6H$ Rotor bar inductance
$L=65(mm)$ Length of the rotor	$E=25(mm)$ Air-gap mean diameter
$L_{1s}=0.0265(H)$ Mutual inductance	$P=1.1(kW)$ Output power