

AUTHORS OF THE GEOGEBRA PROGRAM IN THE FIELD OF ELECTRICAL MACHINES:

1. <https://www.geogebra.org/u/mbjekic> (32 programs)
2. <https://www.geogebra.org/u/wonho> (42 programs)
3. <https://www.geogebra.org/u/shamlou> (book)
4. <https://www.geogebra.org/u/andriollo.mauro>
5. <https://www.geogebra.org/u/alfabeta>
6. <https://www.geogebra.org/u/aliaalataby>
7. <https://www.geogebra.org/u/anattazen>
8. <https://www.geogebra.org/u/antovaz>
9. <https://www.geogebra.org/u/bernd>
10. https://www.geogebra.org/u/c_young
11. <https://www.geogebra.org/u/chrishamper>
12. <https://www.geogebra.org/u/conor.mcdonagh>
13. <https://www.geogebra.org/u/dave+nero>
14. <https://www.geogebra.org/u/davidorser>
15. <https://www.geogebra.org/u/dric>
16. https://www.geogebra.org/u/elvis_1987
17. <https://www.geogebra.org/u/jreed007>
18. <https://www.geogebra.org/u/kurt>
19. <https://www.geogebra.org/u/lenore>
20. <https://www.geogebra.org/u/lucianomorello>
21. <https://www.geogebra.org/u/m.lopezg>
22. <https://www.geogebra.org/u/matthibodeau>
23. <https://www.geogebra.org/u/miguelangelcrespin>
24. <https://www.geogebra.org/u/nedeljko>
25. <https://www.geogebra.org/u/newittphysics>
26. <https://www.geogebra.org/u/olha0707>
27. <https://www.geogebra.org/u/olsona>
28. <https://www.geogebra.org/u/petrkacor74>
29. <https://www.geogebra.org/u/port3f9>
30. <https://www.geogebra.org/u/robphy>
31. <https://www.geogebra.org/u/rouille>
32. <https://www.geogebra.org/u/tomowskiak>
33. <https://www.geogebra.org/u/tomwalsh>
34. <https://www.geogebra.org/u/ulm.clemens>
35. <https://www.geogebra.org/u/vicmarmor>
36. <https://www.geogebra.org/u/walidissa>
37. <https://www.geogebra.org/u/whaynes>

Collected programs in the field of electrical machines: <https://www.geogebra.org/m/TUMQgUrH> (shamlou)

GENERAL PART

1. B field around a wire: <https://www.geogebra.org/m/Xr65rR3b> (Chris Hamper)
2. 3D Rotating coil with EMF and current: <https://www.geogebra.org/m/d8zedXMr> (Chris Hamper)
3. Magnetic Induction: <https://www.geogebra.org/m/JPFxyhtA> (Tom Walsh)
4. 3D Magnetic field from magnet: <https://www.geogebra.org/m/g9DXB8AD> (olha0707)
5. Magnetic Field for Two Wires in 3-D: <https://www.geogebra.org/m/DTnbeTZ3> (Dave Nero)
6. Superposition of Induced Magnetic Fields: <https://www.geogebra.org/m/hxPKcVSb> (Barb Newitt)
7. Ampere's Law: <https://www.geogebra.org/m/NC7aXeRS> (Dave Nero)
8. Faraday's Law: <https://www.geogebra.org/m/Pdv2AJhB> (Dave Nero)
9. Lorentz: <https://www.geogebra.org/m/HXP8xUC3> (Allen Olson)
10. Lorentz force: <https://www.geogebra.org/m/DPWVFwM7> (Chris Hamper)
11. Force on a current in a B field: <https://www.geogebra.org/m/sAN2mFgb> (Chris Hamper)
12. Motional emf: <https://www.geogebra.org/m/bxj2tvzs> (Barb Newitt)
13. Elektromagnetska indukcija – primjer: <https://www.geogebra.org/m/cCDF5UMt> (nedeljko)
14. Amplitude, period and phase of trigonometric function: <https://www.geogebra.org/m/QsyYePBs> (Magnus Karlsson)
15. Phasor Diagram and Sinusoidal Waveforms: <https://www.geogebra.org/m/UPughP3s> (Kurt)
16. le triphasé: <https://www.geogebra.org/m/qtvZHpJW> (rouille)
17. tension simple ou composée: <https://www.geogebra.org/m/wQf6d3wR> (rouille)
18. Three phase circle: <https://www.geogebra.org/m/GjQusv3T> (Conor McDonagh)
19. Driven RLC Circuit Using Phasors: <https://www.geogebra.org/m/uWJTQjsP> (Dave Nero)
20. Series LRC Circuit: <https://www.geogebra.org/m/DsCfTEex#material/fcvfn5tW> (William Haynes)
21. Electric Motor: <https://www.geogebra.org/m/EmHHhHZm> (Lenore Horner)
22. Gen: RightHandTheory: <https://www.geogebra.org/m/jDn7MNbx> (wonho)
23. Gen: LeftHandTheory: <https://www.geogebra.org/m/fPp68Nfm> (wonho)
24. gradient, curl, divergence, potential functions: <https://www.geogebra.org/m/TpXAqBEq> (Tom Owsiak)
25. Vector Fields, Divergence and Curl, and Flux and Circulation Integrals: <https://www.geogebra.org/m/vkhy5eza> (robphy)
26. Divergence and Curl of 2D vector field: <https://www.geogebra.org/m/y8xxrw5u> (Lenore Horner)
27. Active, reactive and apparent power: <https://www.geogebra.org/m/wkdck6vs> (Miroslav Bjekić)
28. Reluctant moment of a magnetic system with one excitation winding: <https://www.geogebra.org/m/fb4z3xjn> (Miroslav Bjekić)
29. Motor Efficiency plot $T=f(w)$: <https://www.geogebra.org/m/gk4bbvxb> (Miroslav Bjekić)
30. Motor Efficiency plots $\eta=f(P)$: <https://www.geogebra.org/m/wwrmqzk> (Miroslav Bjekić)

TRANSFORMERS

Hysteresis and magnetizing current:

31. Gen: Hysterisys01: <https://www.geogebra.org/m/RQsSNCP7> (wonho)
32. Gen: Hysterisys02: <https://www.geogebra.org/m/WqPWpZZK> (wonho)
33. Gen: Hysterisys03: <https://www.geogebra.org/m/bcB3ahVu> (wonho)
34. Hysteresis: <https://www.geogebra.org/m/TUMQgUrH#material/CJkcH> (Walid Issa)
35. Fourier Synthesis: <https://www.geogebra.org/m/QsRaNvH3> (Barb Newitt)
36. Fourier Series: <https://www.geogebra.org/m/BbzsUs42> (ulm.clemens)
37. Impedance Matching With a Transformer: <https://www.geogebra.org/m/CabNWv9c> (Dave Nero)
38. Trasformatore trifase - schemi collegamento avvolgimenti: <https://www.geogebra.org/m/YMgGQrYG#material/UBqp3Jrn> (alfabeta)
39. Magnetization current and components: <https://www.geogebra.org/m/qdag76qy> (Miroslav Bjekić)

Vector diagrams:

40. TransformerVectorDiagram: <https://www.geogebra.org/m/TUMQgUrH#material/fUGV7GB9> (wonho)
41. Tran: TransformerLoad: <https://www.geogebra.org/m/Rszqerbq> (wonho)
42. Tran: TransformerVectorDiagram: <https://www.geogebra.org/m/rTWwbXJY> (wonho)
43. Tran: VoltageRegulation: <https://www.geogebra.org/m/cQBAewKA> (wonho)
44. Transformer voltage variation from no-load to load operation: <https://www.geogebra.org/m/TUMQgUrH#material/Y9EOPHHo> (Mauro Andriollo)
45. Transformer voltage variation from no-load to load operation: <https://www.geogebra.org/m/Y9EOPHHo> (Mauro Andriollo)
46. Voltage drop in power transformer - Kapp diagram: <https://www.geogebra.org/m/e9ufjbvs> (Miroslav Bjekić)

DC MACHINES

Basics

47. DC Motor 3D: <https://www.geogebra.org/m/wcmvnj86> (Abdul Latiff)
48. DC Motor 2D: <https://www.geogebra.org/m/bqpjbrnw> (Abdul Latiff)
49. DC Motor: <https://www.geogebra.org/m/efnjgns6> (Matthew Thibodeau)
50. Elektromotor: <https://www.geogebra.org/m/TUMQgUrH#material/uT7fbSUR> (bernd)
51. DC: Generator Principle: <https://www.geogebra.org/m/YmtNrcdg> (wonho)
52. DC: Motor Principle: <https://www.geogebra.org/m/GrkPMb56> (wonho)
53. Alternador: <https://www.geogebra.org/m/TUMQgUrH#material/tP35XuQS> (Vicente Martín Morales)
54. Magnetismo. Motor eléctrico.: <https://www.geogebra.org/m/TUMQgUrH#material/i6Qtrf66> (Vicente Martín Morales)
55. Funktionsweise eines Gleichstrommotors: <https://www.geogebra.org/m/TUMQgUrH#material/JshA8dn3> (Elvis_1987)
56. DC: Armature Reaction: <https://www.geogebra.org/m/hznspfxU> (wonho)
57. DC Motor: <https://www.geogebra.org/m/TUMQgUrH#material/PN2YrxBb> (Tom Walsh)
58. Moteur DC: <https://www.geogebra.org/m/crpKbtUW> (rouille)
59. Campo magnético producido por una corriente y motor eléctrico: <https://www.geogebra.org/m/br6wmztf> (Oscar Uriel)

Commutation:

60. DC Commutator: <https://www.geogebra.org/m/CGpauBKx> (wonho)
61. DC: Compound Winding: <https://www.geogebra.org/m/TUMQgUrH#material/VM4D6CJm> (wonho)
62. DC: Wave winding: <https://www.geogebra.org/m/sWMJbx8A> (wonho)

DC motor characteristics:

63. Moteur à courant continu: <https://www.geogebra.org/m/wRddXKMV> (dric)
64. DC motor separate excited: <https://www.geogebra.org/m/m2mwpeja> (Miroslav Bjekić)
65. DC motor series excited: <https://www.geogebra.org/m/xyxyypj6> (Miroslav Bjekić)

DC generator characteristics:

66. DC: Self Excite: <https://www.geogebra.org/m/n6fUbtD9> (wonho)
67. DC: Velocity Control: <https://www.geogebra.org/m/erYwTwE5> (wonho)
68. DC: Velocity Control: <https://www.geogebra.org/m/uN4pyDf4> (wonho)
69. DC: Torque Curve: <https://www.geogebra.org/m/nskSJCUh> (wonho)
70. DC: Velocity Curve: <https://www.geogebra.org/m/zGdDhnsY> (wonho)
71. DC: Voltage Curve: <https://www.geogebra.org/m/nktH7YSJ> (wonho)
72. DC generator separat. excited - Load curve $u=f(j)$, $i=\text{const.}$: <https://www.geogebra.org/m/eursnykj> (Miroslav Bjekić)
73. DC generator separat. excited - External curve $u=f(i)$ $j=\text{const.}$: <https://www.geogebra.org/m/ewbcxkfq> (Miroslav Bjekić)
74. DC generator separat. excited - Regul. curve $j=f(i)$ $u=\text{const.}$: <https://www.geogebra.org/m/dj5dp6cu> (Miroslav Bjekić)
75. DC generator separat. excited - S. C. curve $i=f(j)$ $u=0$: <https://www.geogebra.org/m/vrngmsr7> (Miroslav Bjekić)

76. DC generator shunt excited - External curve $u=f(i)$ $j=\text{const.}$: <https://www.geogebra.org/m/agdr9vek> ((Miroslav Bjekić))
77. DC generator series excited - External curve $u=f(i)$ $j=i$: <https://www.geogebra.org/m/gf4pdsq8> (Miroslav Bjekić)
78. DC generator comp. excited - External curve $u=f(i)$ $j=\text{const.}$: <https://www.geogebra.org/m/bdq7tgff> (Miroslav Bjekić)

ASYNCHRONOUS MACHINES

Magnetic field:

79. Armature MMF waves: Sinusoidal windings: <https://www.geogebra.org/m/DjvnEatm#material/XYgD5tmS> (David Orser)
80. 3_phase mmf distribution: <https://www.geogebra.org/m/DB7vC4cj> (David Orser)
81. Rotating Field: <https://www.geogebra.org/m/DsCfTEex#material/XMxy9Vjz> (William Haynes)
82. Magnetic field in a wound rotor induction motor: <https://www.geogebra.org/m/TUMQgUrH#material/LedOp4dc> (Mauro Andriollo)
83. INDUCTION MACHINE: Field space distribution: <https://www.geogebra.org/m/zpyTgFyR> (David Orser)
84. Armature MMF waves: Sinusoidal windings: <https://www.geogebra.org/m/XYgD5tmS> (David Orser)
85. 3-phase winding mmf with pitch shortening: <https://www.geogebra.org/m/rr8zqsgf> (Mauro Andriollo)
86. Single/three-phase winding mmf: <https://www.geogebra.org/m/Qd4bhJRR> (Mauro Andriollo)
87. Synch: Rotating Flux: <https://www.geogebra.org/m/kaMBEenj> (wonho)
88. MMF of a single phase winding: <https://www.geogebra.org/m/qsb6mujw> (Mauro Andriollo)
89. MMF generated by a cage winding with m bars per pole pair: <https://www.geogebra.org/m/ru9r37h8> (Mauro Andriollo)

Vector diagrams:

90. Ind: Induction Motor Vector Diagram: <https://www.geogebra.org/m/TUMQgUrH#material/TkFXgPJ6> (wonho)
91. Ind: Induction Motor Vector Diagram: <https://www.geogebra.org/m/TUMQgUrH#material/TkFXgPJ6> (wonho)
92. Ind: Induction Motor Vector Diagram: <https://www.geogebra.org/m/uNPrKrGP> (wonho)
93. Ind: InductionMotorRPI: <https://www.geogebra.org/m/CkBXZY6Y> (wonho)
94. Ind: VelocityControl: <https://www.geogebra.org/m/zd8r8pyM> (wonho)
95. Ind: TorqueSimple: <https://www.geogebra.org/m/Q7hgsq6c> (wonho)

Characteristics:

96. Steady state characteristics of Induction motor: <https://www.geogebra.org/m/ZSChYYE3> (Walid Issa)
97. Caratteristica meccanica motore asincrono trifase: <https://www.geogebra.org/m/TUMQgUrH#material/VBebJMxn> (Luciano Morello)
98. Motor asíncrono / induction motor: <https://www.geogebra.org/m/TUMQgUrH#material/nec6ZXRp> (m.lopezg)
99. IM mechanical characteristic: <https://www.geogebra.org/m/yfhu4ne5> (Miroslav Bjekić)

Circle diagram:

100. Motor circle diagram: <https://www.geogebra.org/m/sbeqzzjt> (John Reed)
101. Ind: CircleDiagram: <https://www.geogebra.org/m/RKDaGB2C> (wonho)
102. Kruhový diagram asynchronního motoru: <https://www.geogebra.org/m/YSMtfeZr> (Petr)
103. kr_diagram_new_02: <https://www.geogebra.org/m/qdWkPTmW> (Petr)
104. IM circle diagrame I: <https://www.geogebra.org/m/mu45dbvs> (Miroslav Bjekić)
105. IM circle diagrame II: <https://www.geogebra.org/m/yxgjcvs> (Miroslav Bjekić)

Other:

106. Three phase symmetrical components: <https://www.geogebra.org/m/DsCfTEex#material/zqsbfeje> (William Haynes)

SYNCHRONOUS MACHINES

Basics:

107. AC Generator 3D: <https://www.geogebra.org/m/gpjfkhzw> (Abdul Latiff)

Short and Distributed winding (Pitch and Distributed factor):

108. Electrical Machine (Distributed Winding): <https://www.geogebra.org/m/TUMQgUrH#material/VsmXsCzT> (wonyho)

109. Synch: Distributed Winding: <https://www.geogebra.org/m/TUMQgUrH#material/RGAuRxhb> (wonho)

110. Synch: Short Winding: <https://www.geogebra.org/m/TUMQgUrH#material/wdAWzuSp> (wonho)

111. Vector construction of winding factor: <https://www.geogebra.org/m/hghuajt9> (Mauro Andriollo)

Magnetomotive force:

112. Single/three-phase winding mmf: <https://www.geogebra.org/m/Qd4bhJRR> (Mauro Andriollo)

113. Armature mmf waves: Sinusoidal windings: <https://www.geogebra.org/m/KkX6q8q8> (Walid Issa)

114. Flux plots and B-field distributions: <https://www.geogebra.org/m/TUMQgUrH#material/E9cKzUQM> (Walid Issa)

Phasor diagrams:

115. Phasor diagram of synchronous machine and sinusoids: <https://www.geogebra.org/m/aGWDRxwa> (sergiosevero)

116. Phasor diagram of synchronous machine and sinusoids: <https://www.geogebra.org/m/DTyPQcEE> (Mauro Andriollo)

117. Phasor Diagram for Load Condition of Synchronized Generator: <https://www.geogebra.org/m/tZ9A9bXm> (Kenneth Kam)

118. Synchronous Generator Terminal Voltage: <https://www.geogebra.org/m/jfXGJQSA> (William Haynes)

119. Alternateur 1 - Diagramme synchrone: <https://www.geogebra.org/m/dJNfRx48> (dtherin)

120. Synchronous generator cylindrical rotor - vector diagram: <https://www.geogebra.org/m/wkvgda9k> (Miroslav Bjekić)

121. Synchronous motor cylindrical rotor - vector diagram: <https://www.geogebra.org/m/yrpmsvyu> (Miroslav Bjekić)

122. Synchronous generator salient pole - vector diagram: <https://www.geogebra.org/m/qag9azxs> (Miroslav Bjekić)

123. Synchronous motor salient pole - vector diagram: <https://www.geogebra.org/m/sb2ndpns> (Miroslav Bjekić)

124. Synchronous Machine Phasor Diagram: <https://www.geogebra.org/m/cRMqd2YM> (alialataby)

Synchronous machine and No-load characteristic:

125. Blondel diagram: <https://www.geogebra.org/m/kMy3DAQu> (Mauro Andriollo)

126. Potier diagram for the synchronous machine: <https://www.geogebra.org/m/UelaETq8> (Mauro Andriollo)

Excitation change:

127. Machine synchrone à excitation constante couplée au reseau: <https://www.geogebra.org/m/shThTR6n> (dtherin)

128. Ggb-SL-MS transfert de puissance & diagramme synchrone v: <https://www.geogebra.org/m/fDrAc7cB> (GeoGebra Forum)

Voltage change

129. Synchronous machine - Potier diagram: <https://www.geogebra.org/m/jr6ky3nw> (Miroslav Bjekić)

130. Synchronous machine - Swedish diagram: <https://www.geogebra.org/m/fd93jt8w> (Miroslav Bjekić)

131. Synchronous machine - American diagram: <https://www.geogebra.org/m/xsmvrgej> (Miroslav Bjekić)

Power:

- 132. Alternateur 2 - Diagramme synchrone sans résistance: <https://www.geogebra.org/m/QBuqCkU8> (dtherin)
- 133. Synchronous Generator: <https://www.geogebra.org/m/uweh5xuc> (Ciaran Young)
- 134. Synch: PowerAngle_Motor: <https://www.geogebra.org/m/yqebFDxH> (wonho)
- 135. Synch: VCurve_Motor: <https://www.geogebra.org/m/Bk7DeXYd> (wonho)
- 136. Synch: VCurve Generator: <https://www.geogebra.org/m/xxfHEAHk> (wonho)

Synchronous generator operating range:

- 137. Capabilities Diagram: <https://www.geogebra.org/m/jsYukcSa> (Kenneth Kam)
- 138. Synchronous machine - PQ diagram TG: <https://www.geogebra.org/m/x4xcppyf> (Miroslav Bjekić)
- 139. Synchronous machine - PQ diagram HG: <https://www.geogebra.org/m/x9rhmnrf> (Miroslav Bjekić)

Parallel work:

- 140. **Synchroscope**: <https://www.geogebra.org/m/XtH4aUy4> (William Haynes)
- 141. Synch: Parallel Connection: <https://www.geogebra.org/m/MrEtEnMW> (wonho)
- 142. Synch: Parallel Connection: <https://www.geogebra.org/m/WH8RQCqP> (wonho)
- 143. **Generator Paralleling Simulator**: <https://www.geogebra.org/m/vbtjdftu> (William Haynes)

Other:

- 144. Synch: $E=V+I_sR_s$ Graph (Generator): <https://www.geogebra.org/m/ZxJPMkKF> (wonho)
- 145. Synchronous machine - Synchronization: <https://www.geogebra.org/m/jtyuyyn4> (Miroslav Bjekić)
- 146. V curves of synchronous machines: <https://www.geogebra.org/m/bq9qxktv> (Miroslav Bjekić)
- 147. Short circuit of synchronous machines: <https://www.geogebra.org/m/ya9j7zcm> (Miroslav Bjekić)

SPECIAL ELECTRICAL MACHINES

Universal motor:

148. Universal motor: <https://www.geogebra.org/m/srue2dsb> (Miroslav Bjekić)

Single-phase asynchronous motor:

149. Etc: SingleIndSimpleTwoPhaseAdd: <https://www.geogebra.org/m/wQjCSusM> (wonho)

150. Etc: SingleIndTorque: <https://www.geogebra.org/m/HP8ZUJRT> (wonho)

151. Etc: PulsingFlux: <https://www.geogebra.org/m/uyU9ftYH> (wonho)

152. Single phase motor start: <https://www.geogebra.org/m/TUMQgUrH#material/k8B599Zp> (Walid Issa)

153. Counter-rotating Fields: <https://www.geogebra.org/m/DsCfTEex#material/vmr9f84w> (William Haynes)

154. IM $q=1$ or $q=2$ Mechanical characteristics: <https://www.geogebra.org/m/mtzxecem> (Miroslav Bjekić)

Step motor:

155. Etc: SteppingMotor: <https://www.geogebra.org/m/ZPYAWKXt> (wonho)

Brushless motor:

156. Le moteur Brushless: <https://www.geogebra.org/m/ptdxJezR> (dric)

Automation

157. Codeur incrémental: <https://www.geogebra.org/m/c7g7zbkt> (dric)

158. Hachage PWM (constante): <https://www.geogebra.org/m/jzanejfg> (dric)

159. Codeur incrémental (décodage): <https://www.geogebra.org/m/mqy8tuxv> (dric)

160. Hachage PWM: <https://www.geogebra.org/m/AbGgs9VS> (dric)

161. PWM Modulator using Triangle or Sawtooth waves: <https://www.geogebra.org/m/HD2QHqna> (Jonathan Audy)

162. Unipolar pulse width modulation: <https://www.geogebra.org/m/Eztr7eIM> (Mauro Andriollo)