
MPC Simulation results for healthy and faulty operation

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Contents

1	Simulation Results	3
1.1	One Module	3
1.1.1	Healthy Operation	3
1.2	Two Modules	5
1.2.1	Healthy Operation	5
1.2.2	Faulty Operation	8
1.2.3	Faulty Operation Equal Torque Shared	11

1 Simulation Results

1.1 One Module

The simulation parameters are as follows:

Speed Ref (rpm)	Tload (Nm)
200->600 (at t=2sec)	10->31.83 (at t=1sec)

1.1.1 Healthy Operation

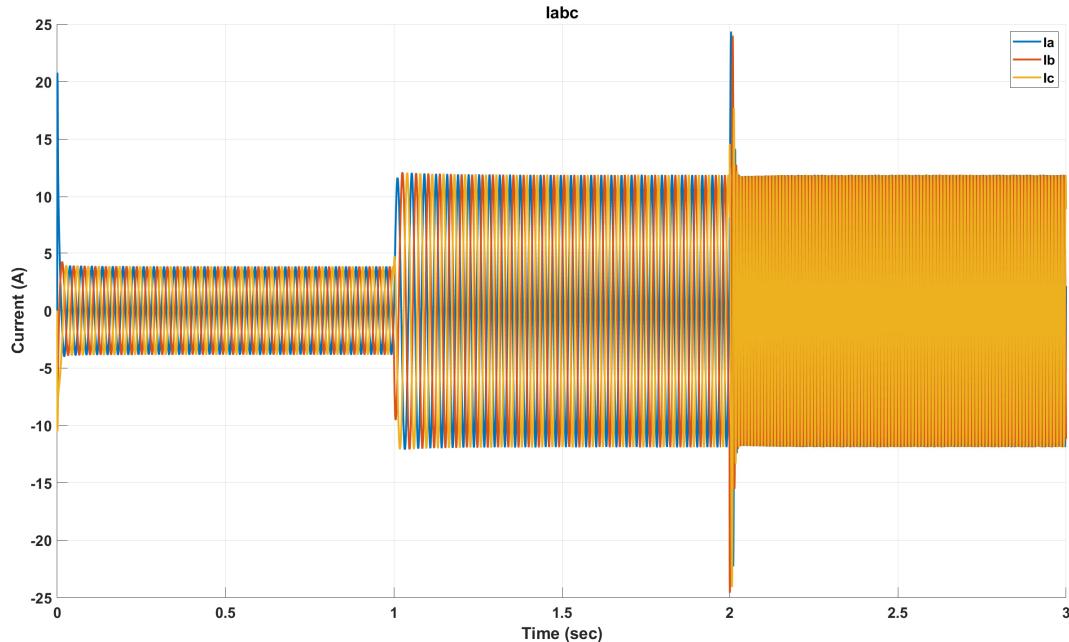


Figure 1: abc Phase Currents for Healthy One Module Operation

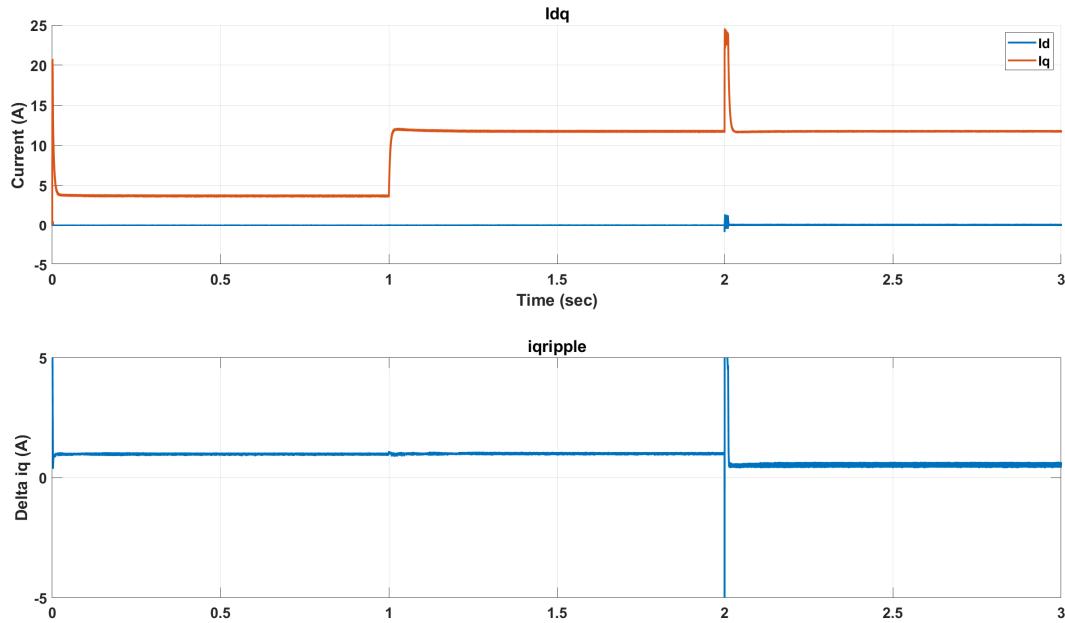


Figure 2: dq Phase Currents and Iq Ripple Estimation for Healthy One Module Operation

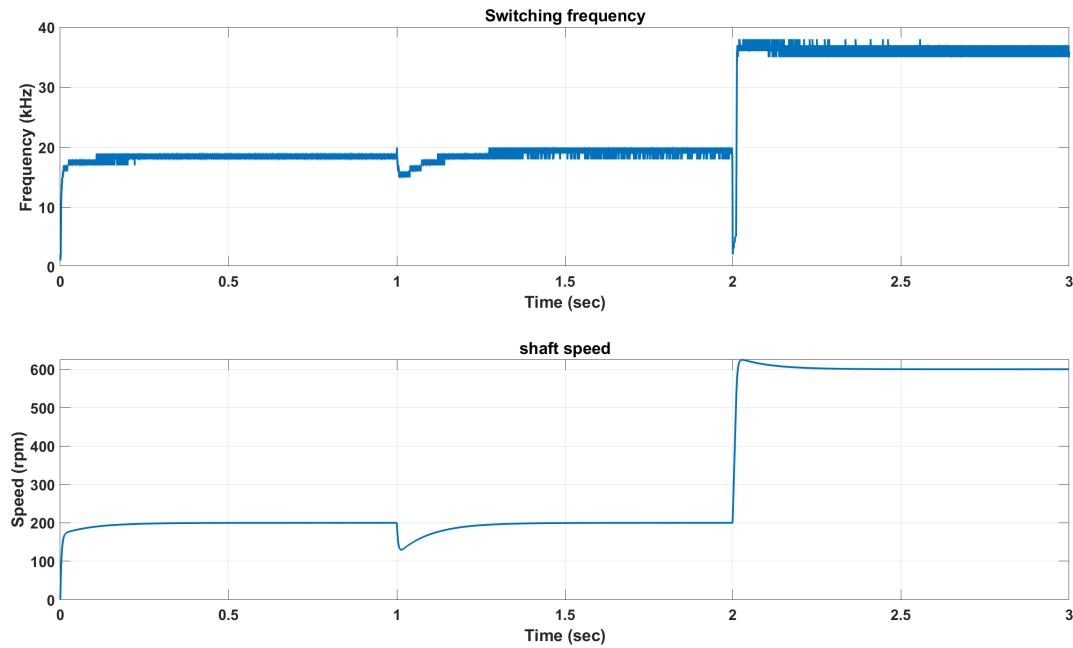


Figure 3: Shaft Speed and Switching Frequency for Healthy One Module Operation

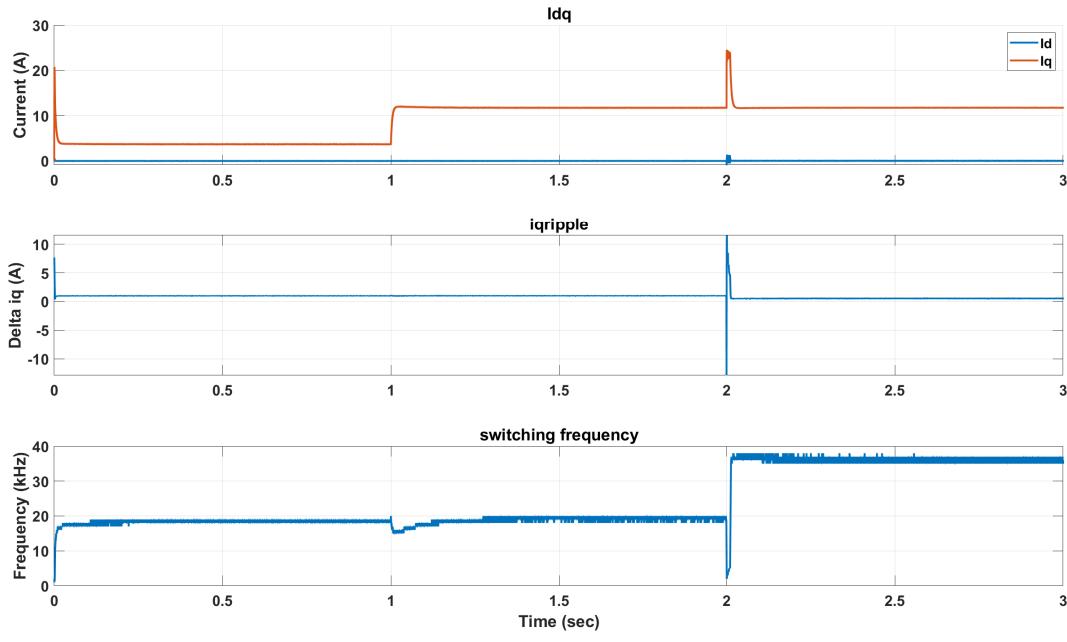


Figure 4: Torque, Iq Ripple and Switching Frequency for Healthy One Module Operation

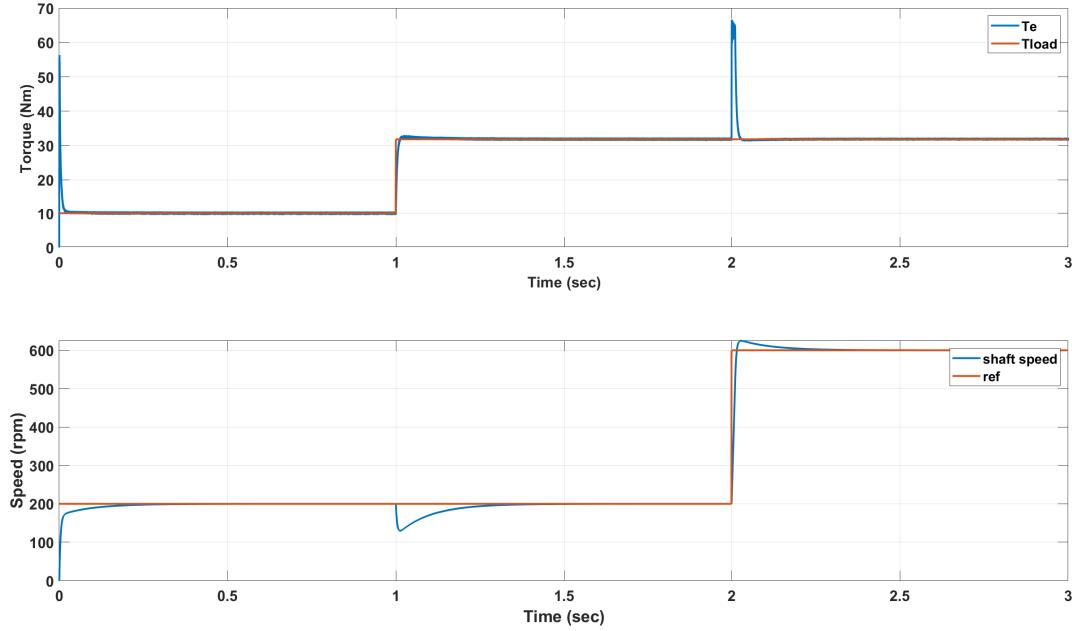


Figure 5: Torque and Shaft Speed for Healthy One Module Operation

1.2 Two Modules

1.2.1 Healthy Operation

This section contains informations.

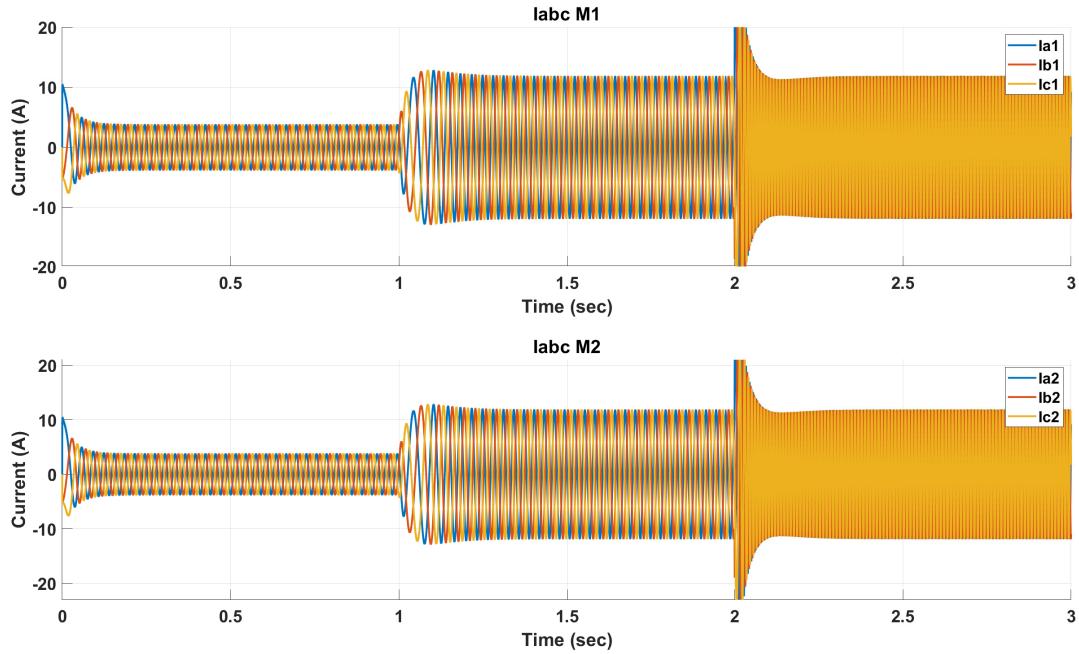


Figure 6: abc Phase Currents for Healthy Two Modules Operation

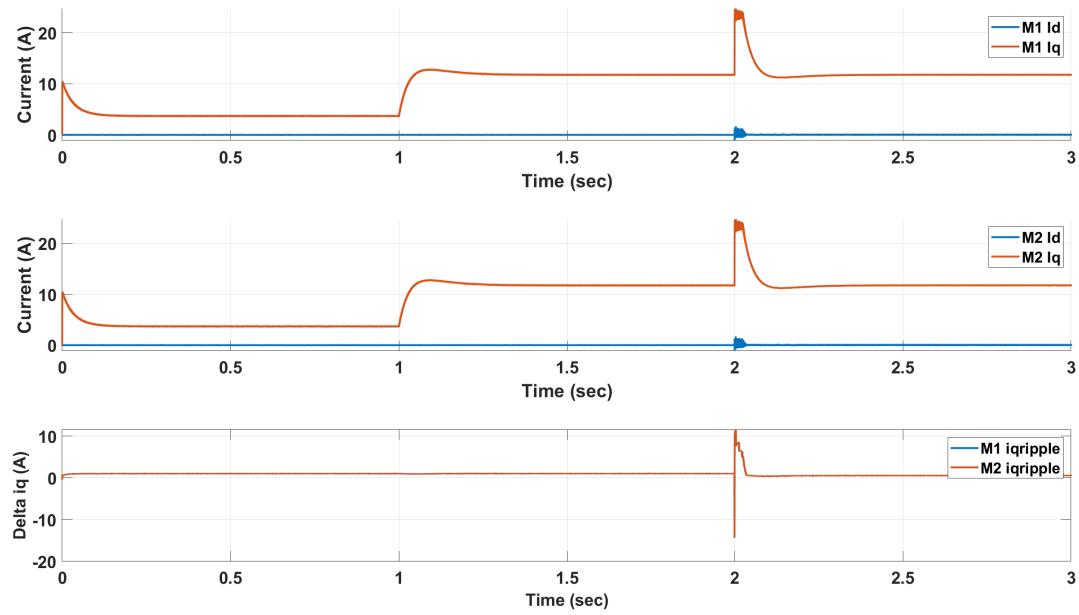
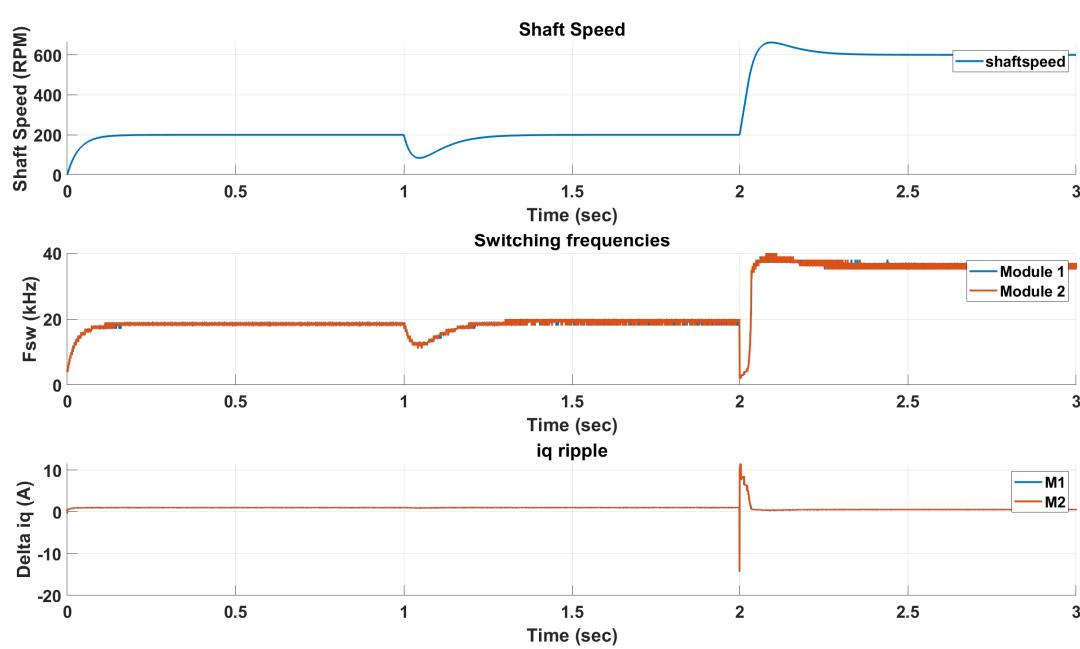
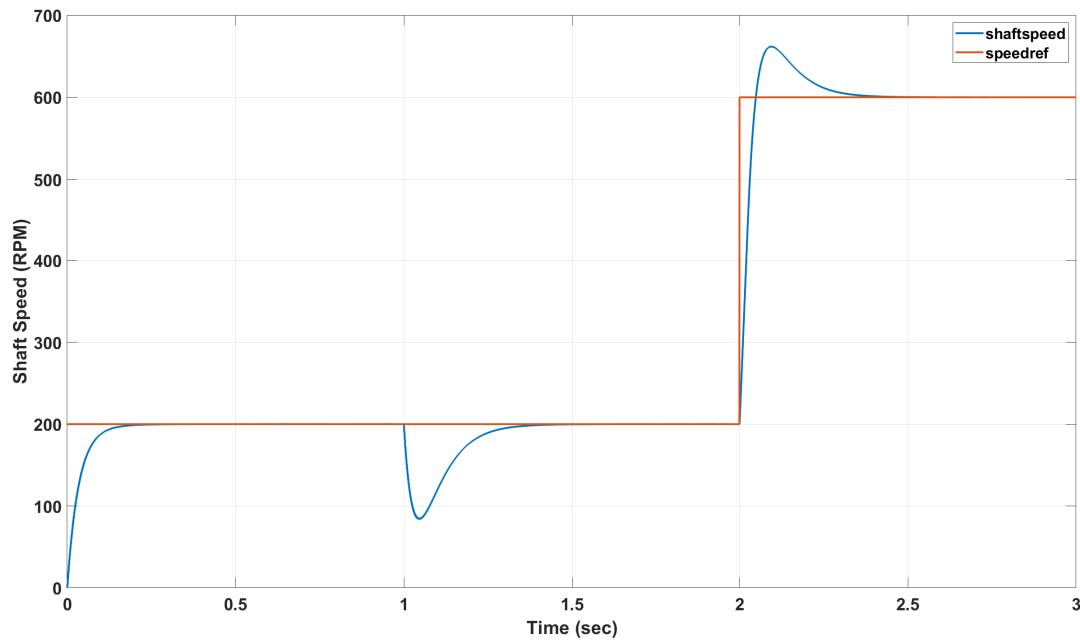


Figure 7: dq Phase Currents for Healthy Two Modules Operation



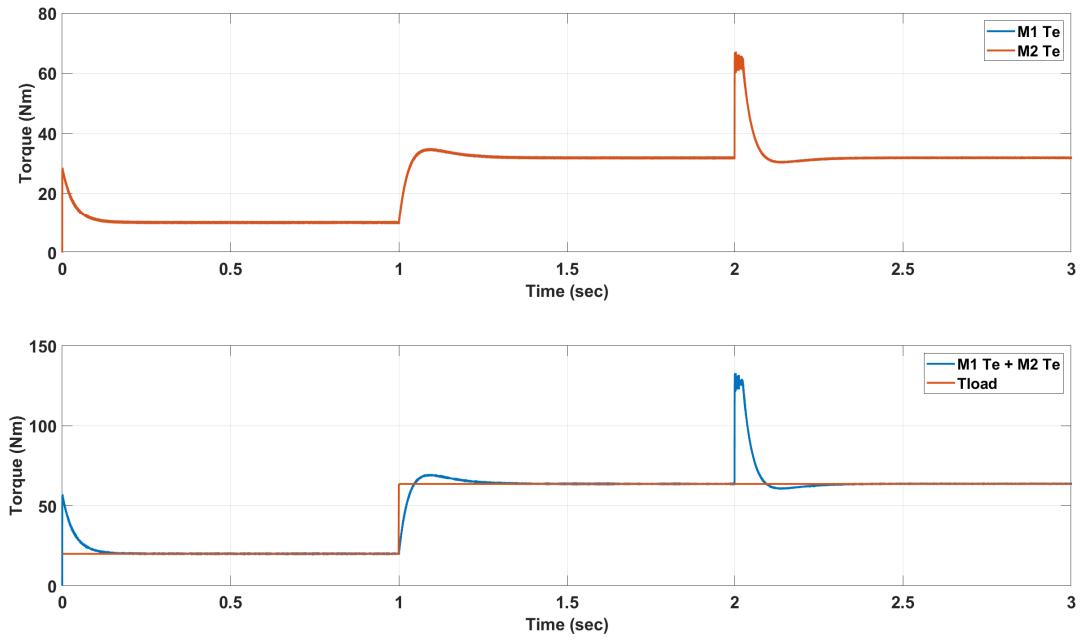


Figure 10: Torque Waveform for Healthy Two Modules Operation

1.2.2 Faulty Operation

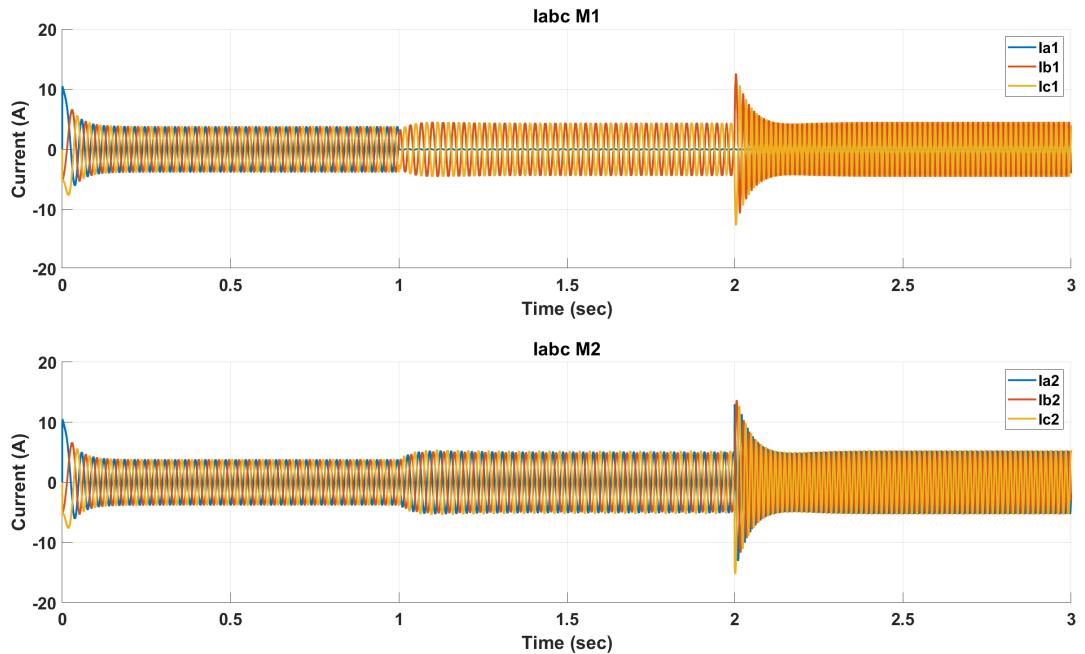


Figure 11: abc Phase Currents for Faulty Two Modules Operation

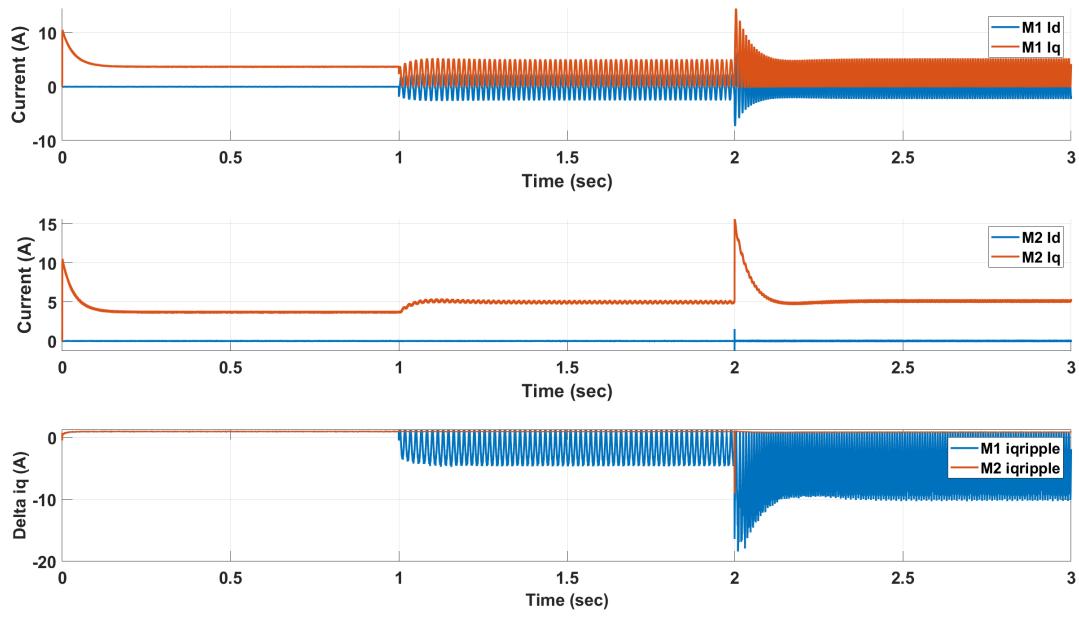


Figure 12: dq Phase Currents for Faulty Two Modules Operation

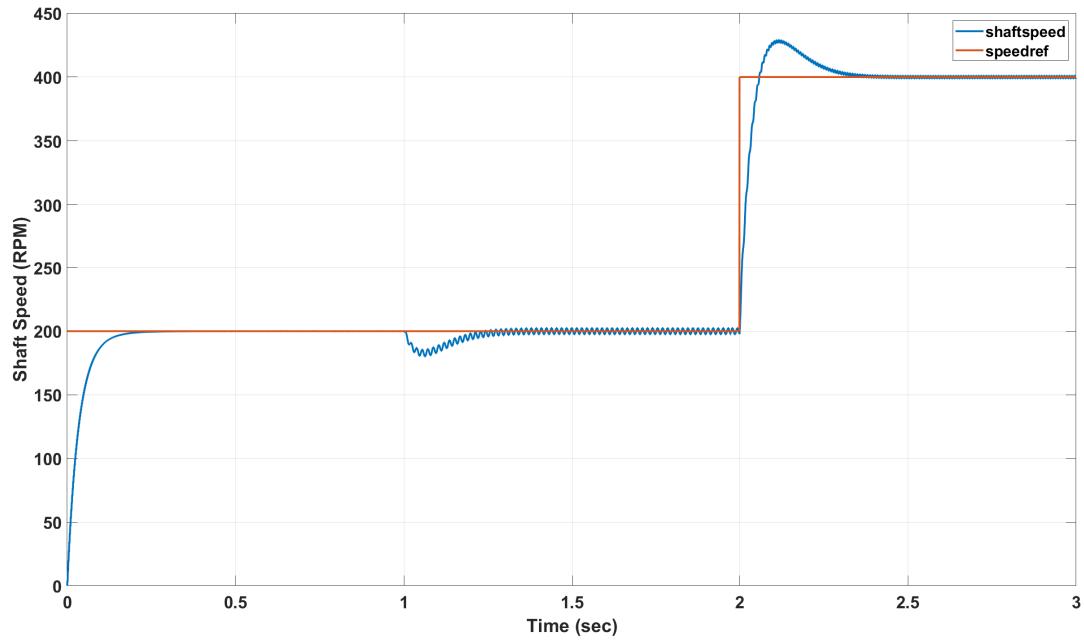


Figure 13: Shaft Speed for Faulty Two Modules Operation

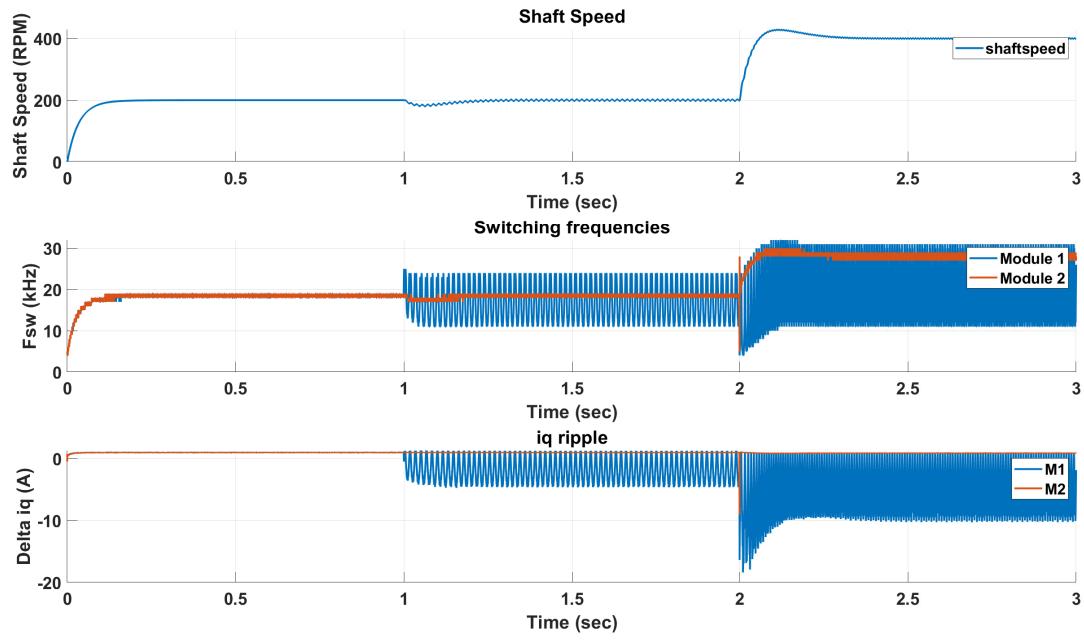


Figure 14: Shaft Speed and Switching Frequency for Faulty Two Modules Operation

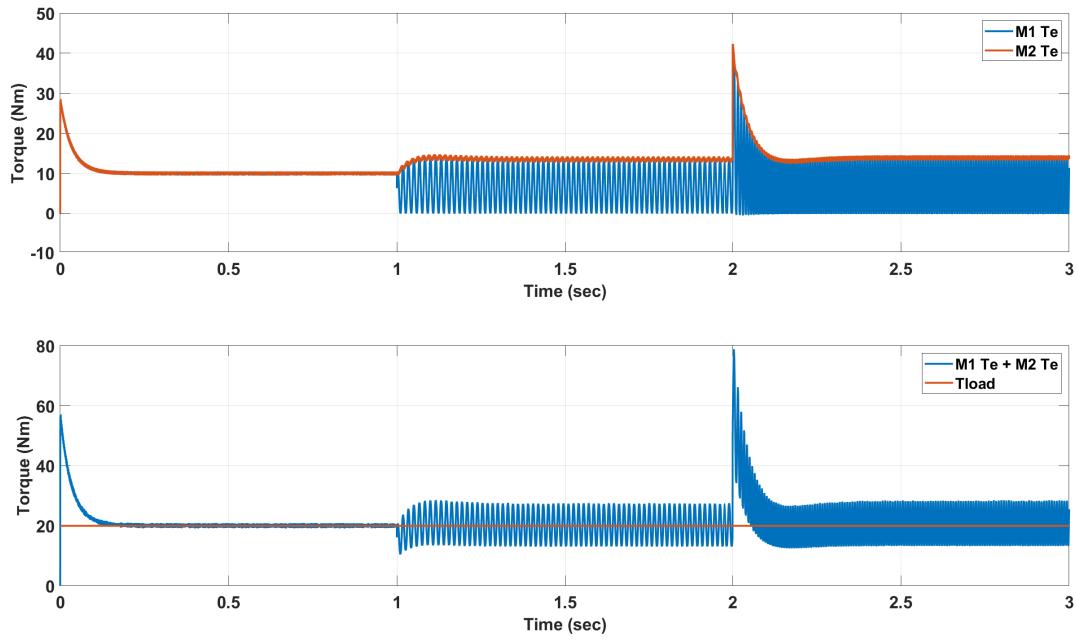


Figure 15: Torque Waveform for Faulty Two Modules Operation

1.2.3 Faulty Operation Equal Torque Shared

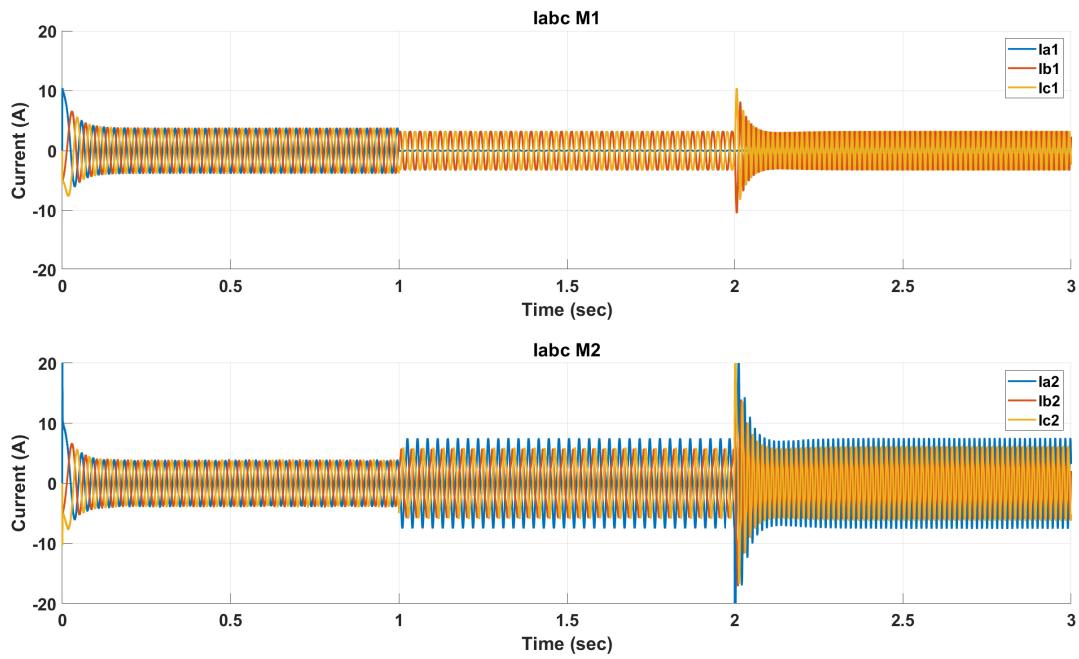


Figure 16: abc Phase Currents for Faulty (equal torque shared) Two Modules Operation

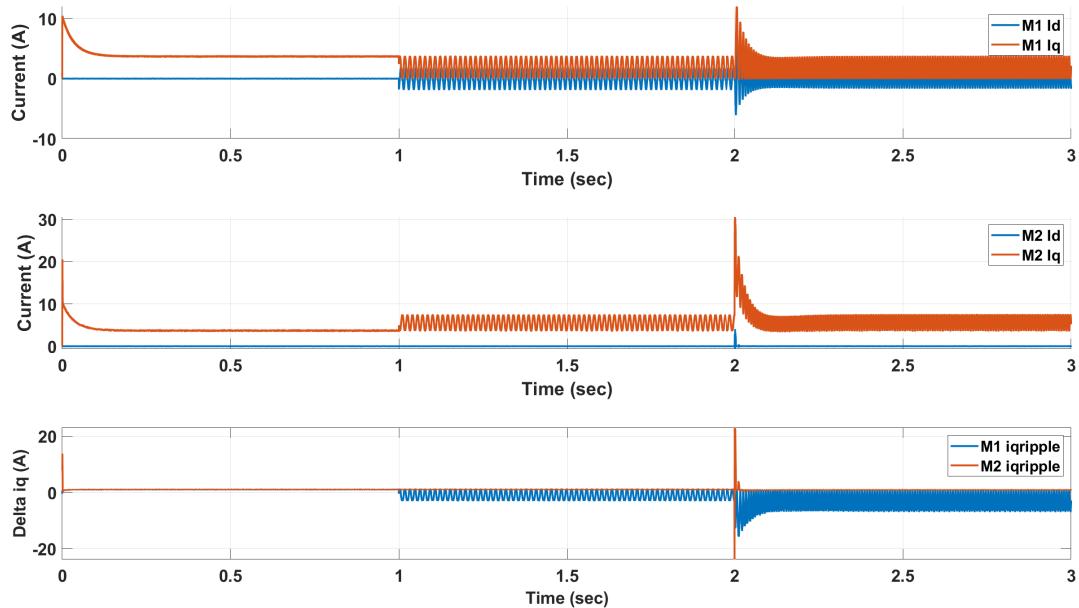


Figure 17: dq Phase Currents for Faulty (equal torque shared) Two Modules Operation

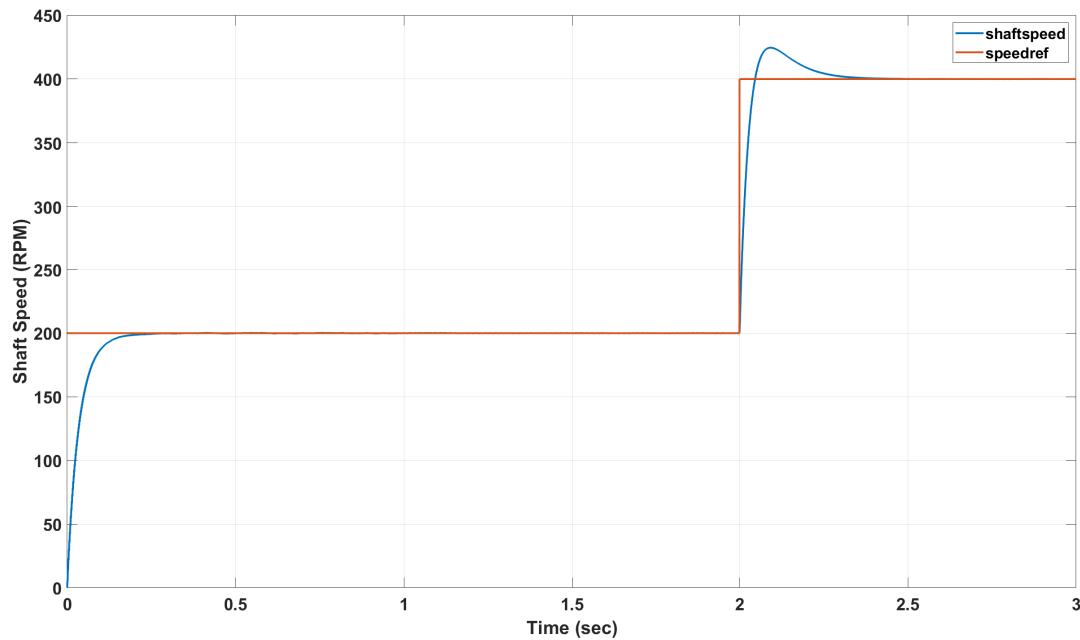


Figure 18: Shaft Speed for Faulty (equal torque shared) Two Modules Operation

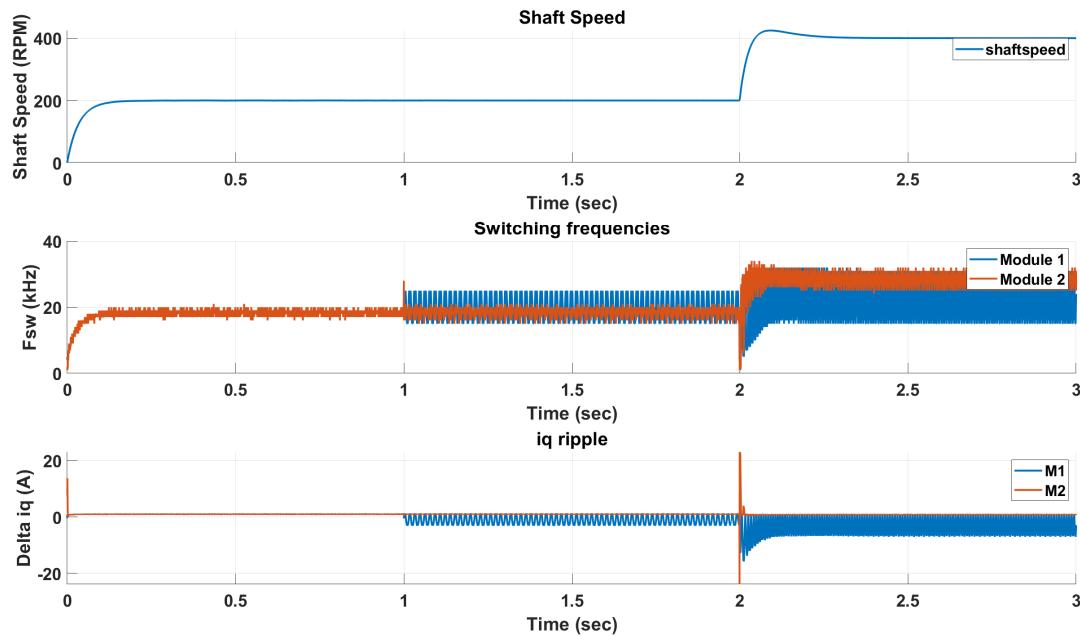


Figure 19: Shaft Speed and Switching Frequency for Faulty (equal torque shared) Two Modules Operation

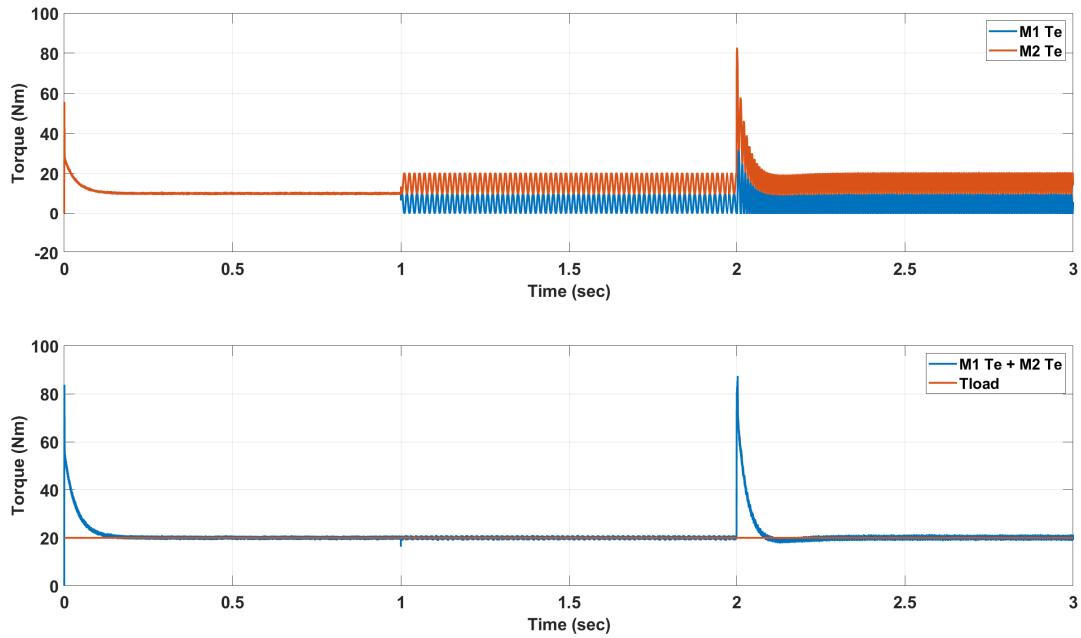


Figure 20: Torque Waveform for Faulty (equal torque shared) Two Modules Operation

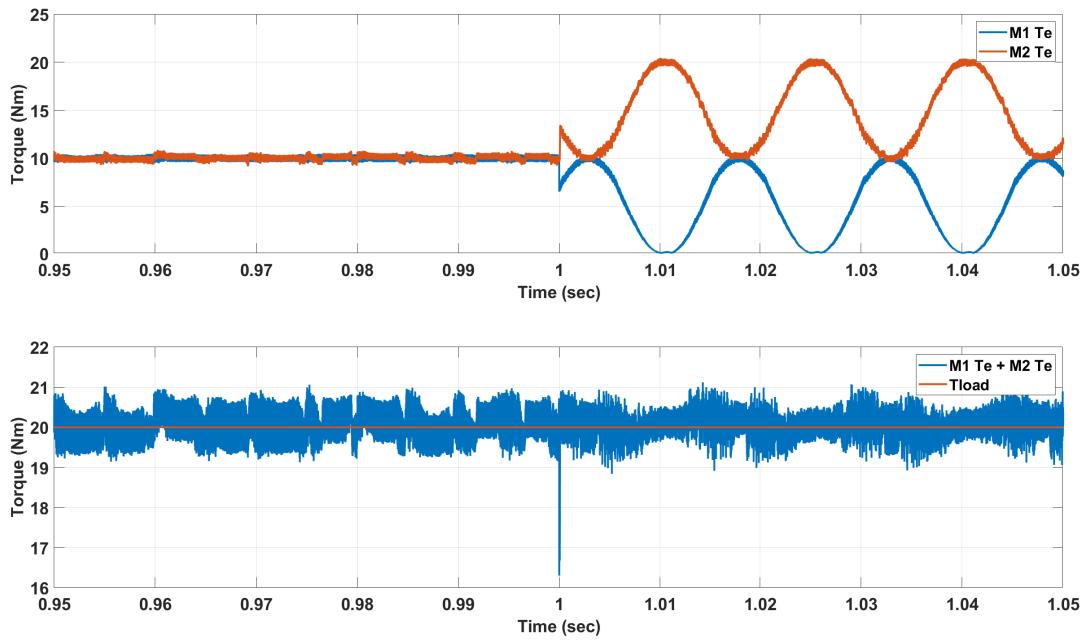


Figure 21: Torque Waveform for Faulty (equal torque shared) Two Modules Operation (fault moment)

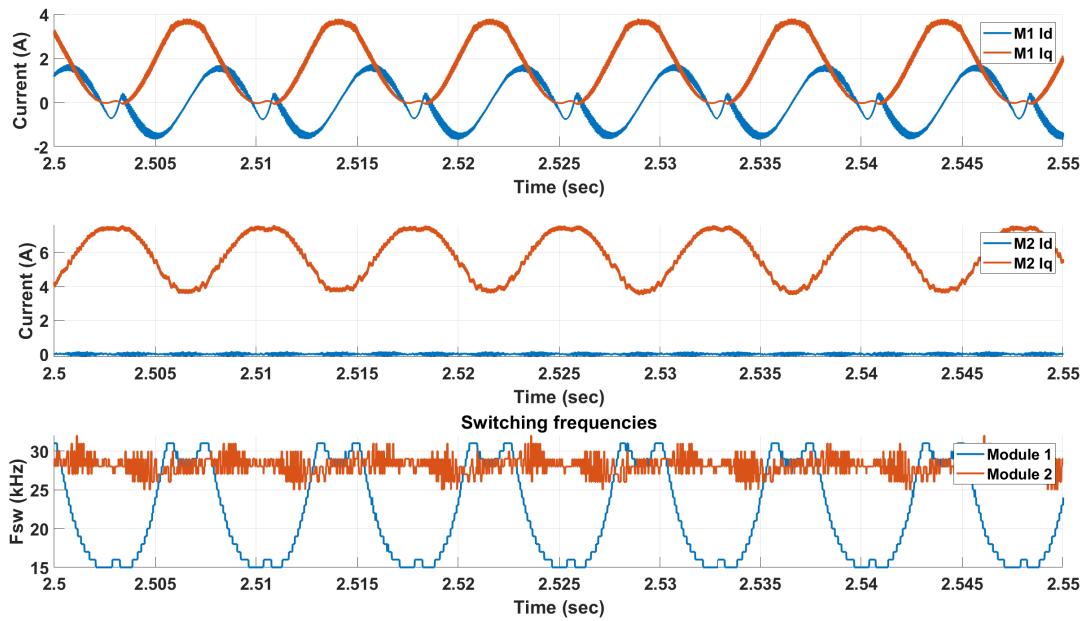


Figure 22: dq Phase Currents for Faulty (equal torque shared) Two Modules Operation (closer)

References