Motor Control Dataset Statistics

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1 Data Statistics

rate	aa	VdRef_V	VariableSpd	IdMeas_A	bb	VariableQ	Time_VSpd	TqVariableTq	Speed_Hz	IqMeas_A	VqRef_V	Time	Torque_Perc	VariableD	Time_I
nolm	(10224, 1)	(10224, 1)	(20480, 1)	(10256, 1)	(10256, 1)	(20480, 1)	(10224, 1)	(20480, 1)	(10224, 1)	(10256, 1)	(10224, 1)	(20480, 1)	(10224, 1)	(20480, 1)	(10256, 1)
lm10hz	(10231, 1)	(10231, 1)	(20480, 1)	(10249, 1)	(10249, 1)	(20480, 1)	(10231, 1)	(20480, 1)	(10231, 1)	(10249, 1)	(10231, 1)	(20480, 1)	(10231, 1)	(20480, 1)	(10249, 1)
lm68hz	(10178, 1)	(10178, 1)	(20480, 1)	(10302, 1)	(10302, 1)	(20480, 1)	(10178, 1)	(20480, 1)	(10178, 1)	(10302, 1)	(10178, 1)	(20480, 1)	(10178, 1)	(20480, 1)	(10302, 1)
lm30hz	(10238, 1)	(10238, 1)	(20480, 1)	(10242, 1)	(10242, 1)	(20480, 1)	(10238, 1)	(20480, 1)	(10238, 1)	(10242, 1)	(10238, 1)	(20480, 1)	(10238, 1)	(20480, 1)	(10242, 1)
lm50hz	(10229, 1)	(10229, 1)	(20480, 1)	(10251, 1)	(10251, 1)	(20480, 1)	(10229, 1)	(20480, 1)	(10229, 1)	(10251, 1)	(10229, 1)	(20480, 1)	(10229, 1)	(20480, 1)	(10251, 1)

Figure 1.1: Dimensions of Features in the Dataset

rate	aa	VdRef_V	VariableSpd	IdMeas_A	bb	VariableQ	Time_VSpd	TqVariableTq	Speed_Hz	IqMeas_A	VqRef_V	Time	Torque_Perc	VariableD	Time_I
nolm	2	-14.81	-3	-0.84	1	-254	0.0	-87	-0.02	-1.23	-7.14	0.0	-2.12	-527	-0.0
lm10hz	2	-14.59	1262	-1.8	1	-96	0.0	-35	9.63	-0.83	4.38	0.0	-0.85	-519	-0.0
lm68hz	2	-101.16	8815	-28.38	1	-54	0.0	-65	67.25	-0.47	-1.46	0.0	-1.59	-3599	-0.0
lm30hz	2	-48.03	3817	-12.49	1	-39	0.0	-31	29.12	-0.34	7.81	0.0	-0.76	-1709	-0.0
lm50hz	2	-60.94	6521	-17.76	1	-31	0.0	-95	49.75	-0.27	294.36	0.0	-2.32	-2168	-0.0

Figure 1.2: Min Value of Features in the Dataset

rate	aa	VdRef_V	VariableSpd	IdMeas_A	bb	VariableQ	Time_VSpdTq	VariableTq	Speed_Hz	IqMeas_A	VqRef_V	Time	Torque_Perc	VariableD	Time_I
nolm	20480	52.98	32767	9.0	20479	11589	41.39	32767	248.97	99.94	325.73	41.39	799.44	1885	41.38
lm10hz	20480	25.46	32767	10.27	20479	4199	41.42	32767	249.68	34.89	118.02	41.42	799.34	1185	41.41
lm68hz	20479	32.94	32767	9.22	20480	11563	41.42	32767	249.98	98.95	325.0	41.42	799.66	1172	41.42
lm30hz	20480	27.4	32767	9.59	20479	9010	41.42	32767	32.92	76.37	253.24	41.42	120.8	1106	41.42
lm50hz	20479	11.05	32767	7.0	20480	11531	41.42	32767	53.76	98.95	324.1	41.42	126.93	808	41.42

Figure 1.3: Max Value of Features in the Dataset

rate	aa	VdRef_V	VariableSpd	IdMeas_A	bb	VariableQ	Time_VSpdTq	VariableTq	Speed_Hz	IqMeas_A	VqRef_V	Time	Torque_Perc	VariableD	Time_I
nolm	10241.74	11.56	18462.95	7.19	10239.26	2869.3	20.69	16520.79	31.51	0.48	159.97	20.69	5.93	620.44	20.68
lm10hz	10240.42	7.11	17127.84	8.88	10240.58	1737.86	20.73	17343.63	11.31	3.86	85.25	20.73	46.68	638.96	20.73
lm68hz	10238.88	-26.88	20996.98	4.03	10242.1	5820.43	20.72	17483.04	69.36	7.09	305.91	20.73	49.29	-241.53	20.73
lm30hz	10237.97	-8.17	18393.53	8.56	10243.03	4167.56	20.7	17286.14	30.65	4.13	220.93	20.71	44.14	348.55	20.71
lm50hz	10237.19	-12.08	19757.41	5.98	10243.81	5851.86	20.68	17394.76	51.44	5.38	311.83	20.69	49.3	130.56	20.69

Figure 1.4: Mean Value of Features in the Dataset

rate	aa	VdRef_V	VariableSpd	IdMeas_A	bb	VariableQ	Time_VSpdTq	VariableTq	Speed_Hz	IqMeas_A	VqRef_V	Time	Torque_Perc	VariableD	Time_I
nolm	5913.09	8.81	14632.09	2.29	5911.05	4356.58	11.95	16269.0	32.55	1.58	132.07	11.95	16.38	357.36	11.95
lm10hz	5912.18	8.84	15645.7	0.52	5911.96	1403.59	11.95	15481.77	3.56	4.15	16.9	11.95	44.57	447.09	11.95
lm68hz	5914.85	46.76	11857.9	0.52	5909.31	5074.82	11.97	15433.98	7.43	6.11	16.56	11.96	47.16	1371.83	11.95
lm30hz	5911.78	18.52	14375.31	0.38	5912.35	3726.76	11.96	15529.12	1.22	4.13	15.02	11.96	42.89	791.47	11.96
lm50hz	5912.35	22.12	13012.66	0.58	5911.79	5262.3	11.96	15427.7	1.27	5.78	8.27	11.96	44.51	790.48	11.96

Figure 1.5: Standard Deviation Value of Features in the Dataset
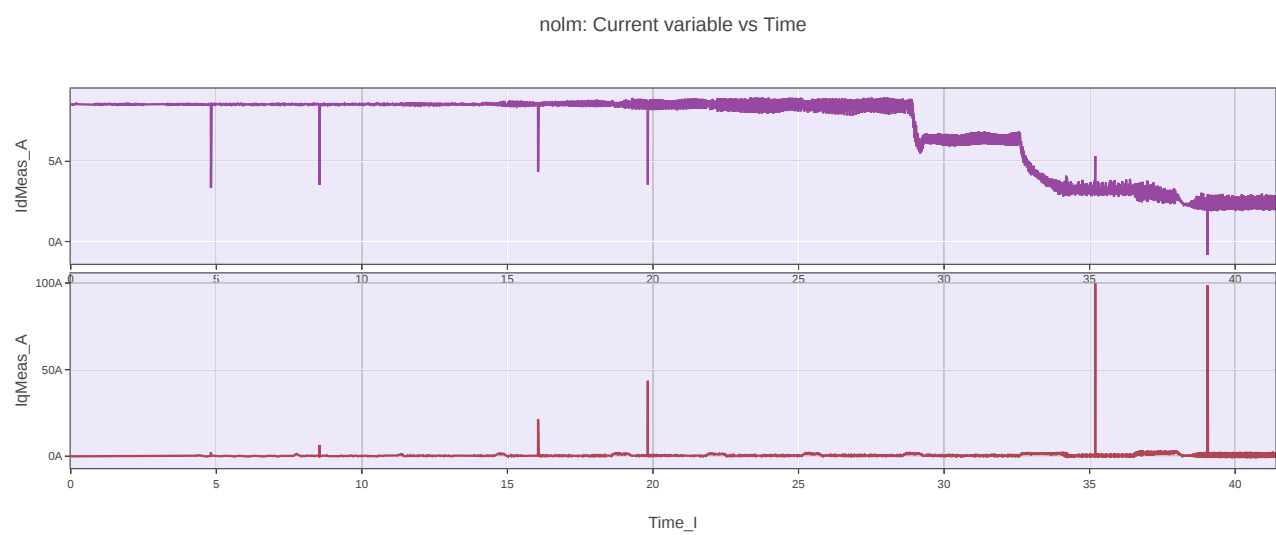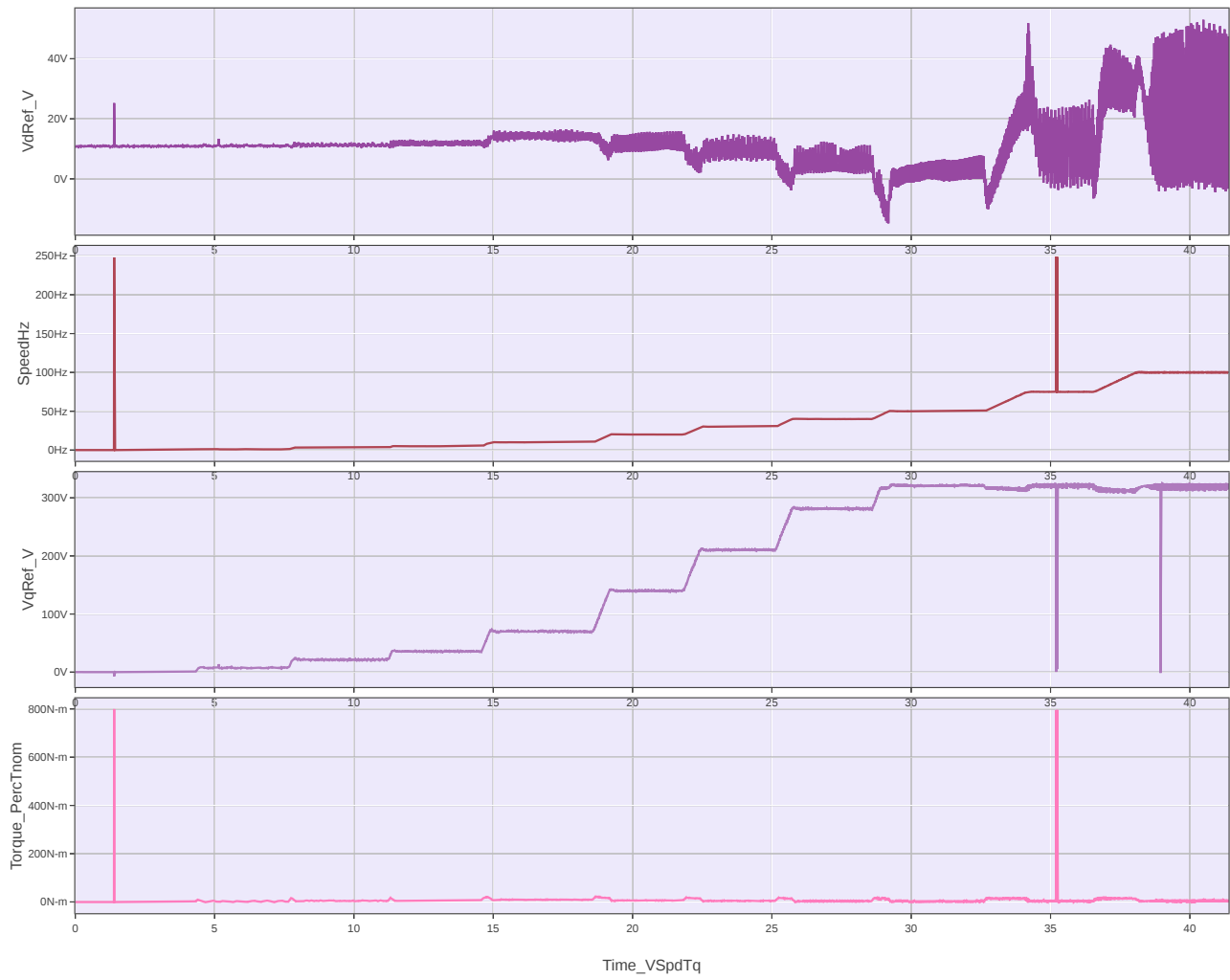
2 Data Plots

Figure 2.1: nolm: current vs time

Figure 2.2: nolm: voltage, torque and speed vs time
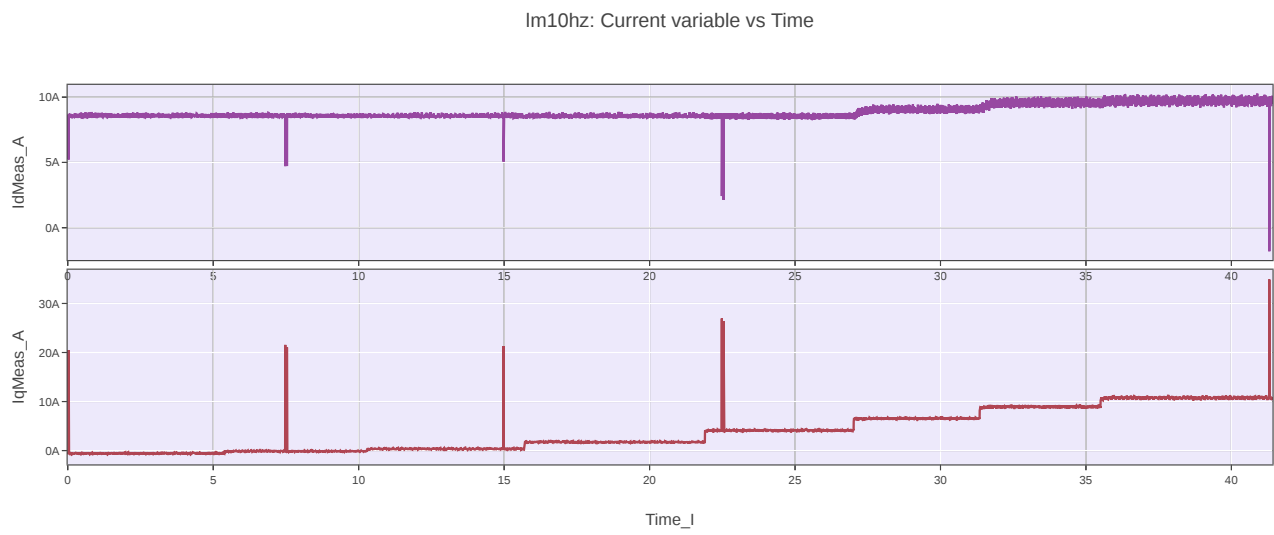
Figure 2.3: lm10hz: current vs time

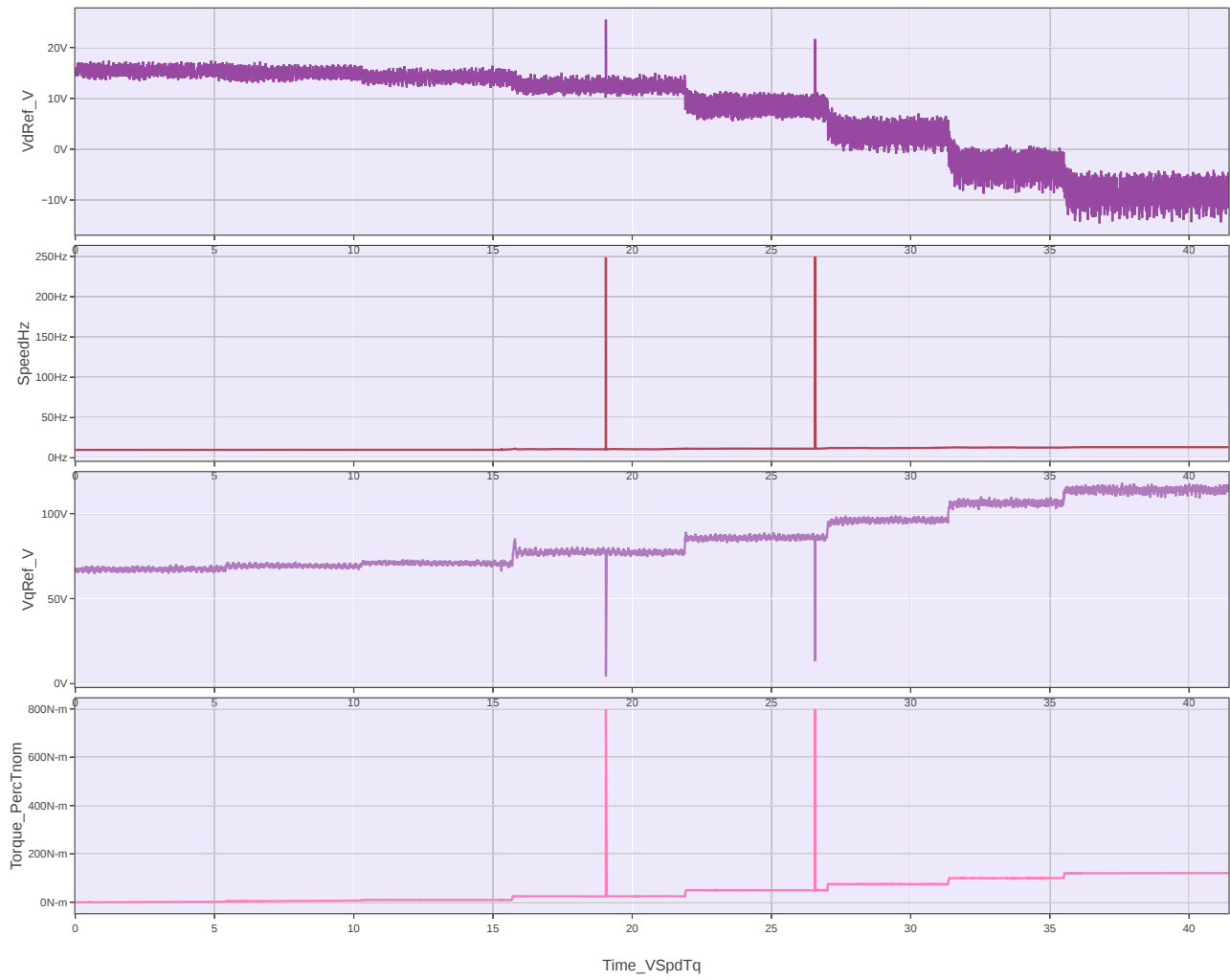Figure 2.4: lm10hz: voltage, torque and speed vs time
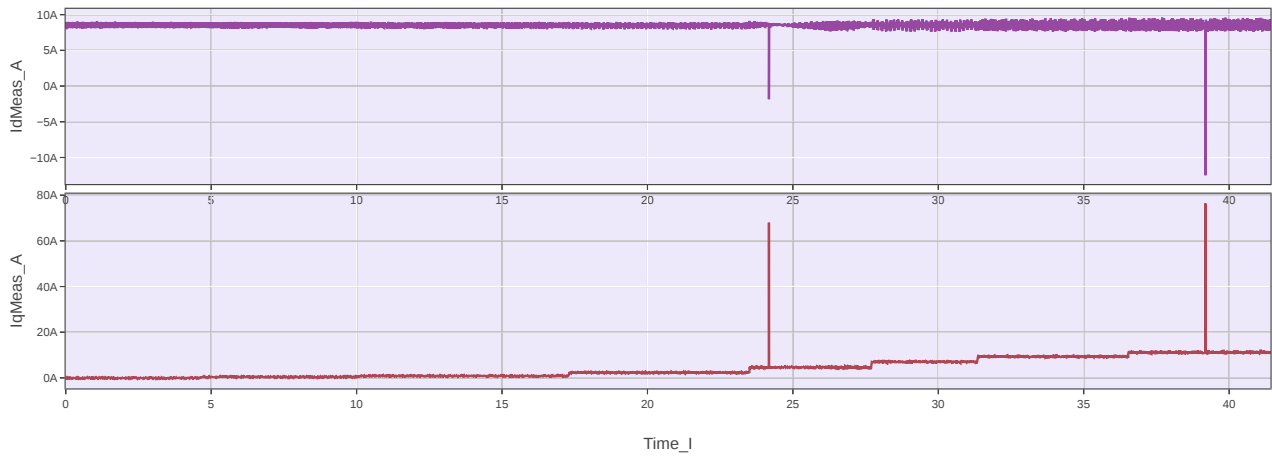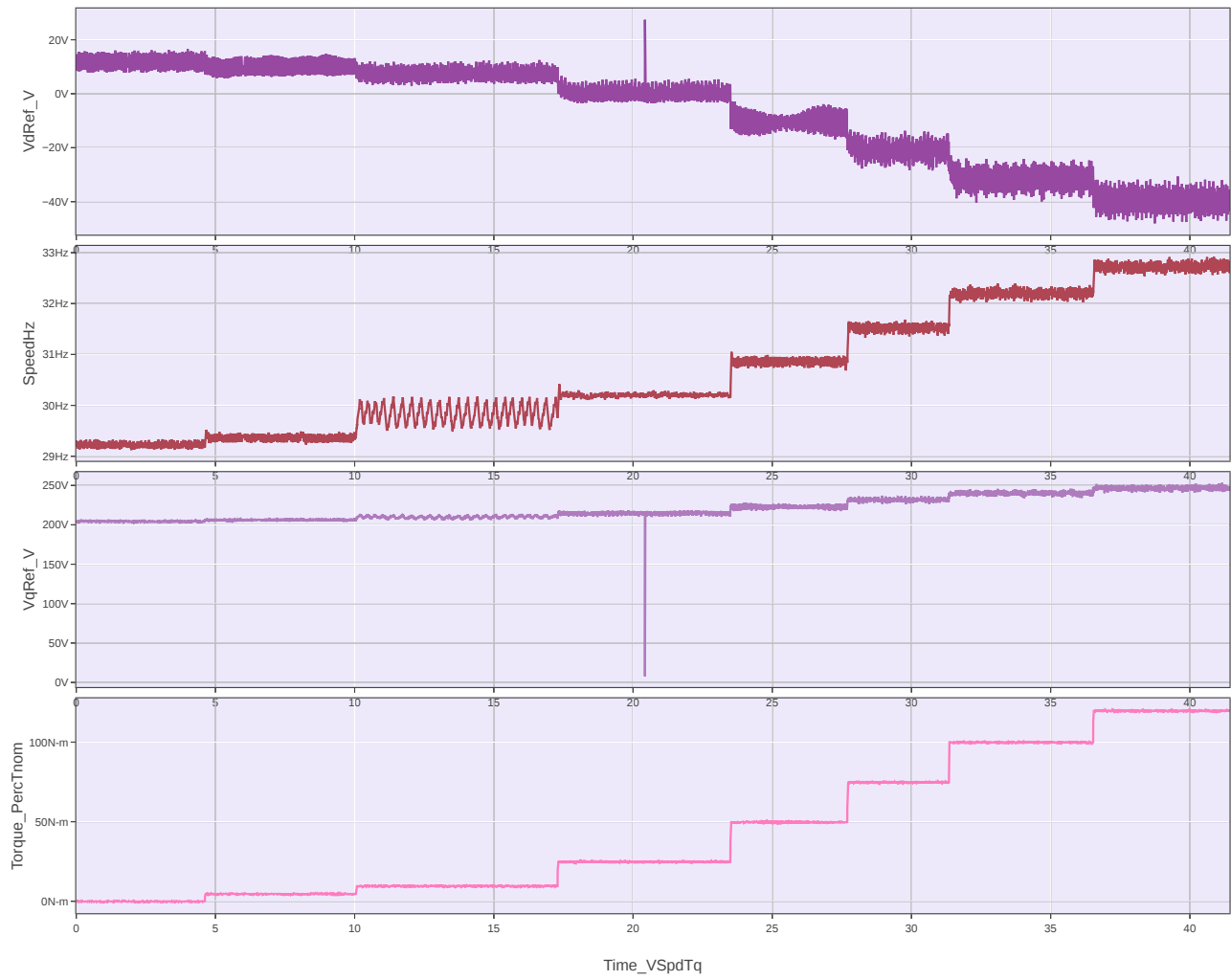
Figure 2.5: lm30hz: current vs time

Figure 2.6: lm30hz: voltage, torque and speed vs time
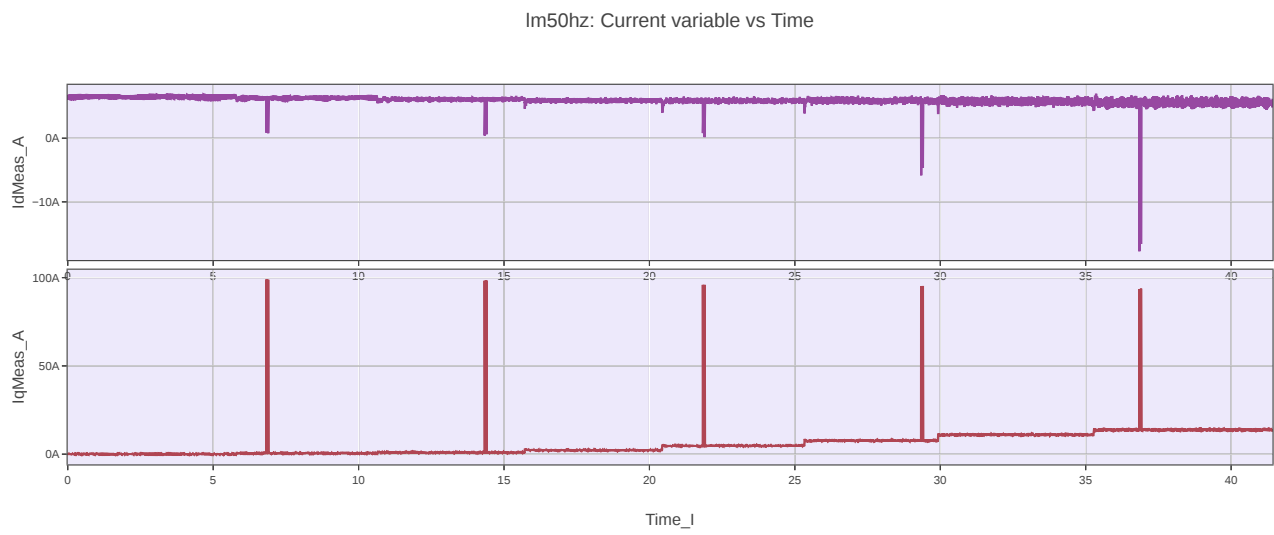
Figure 2.7: lm50hz: current vs time

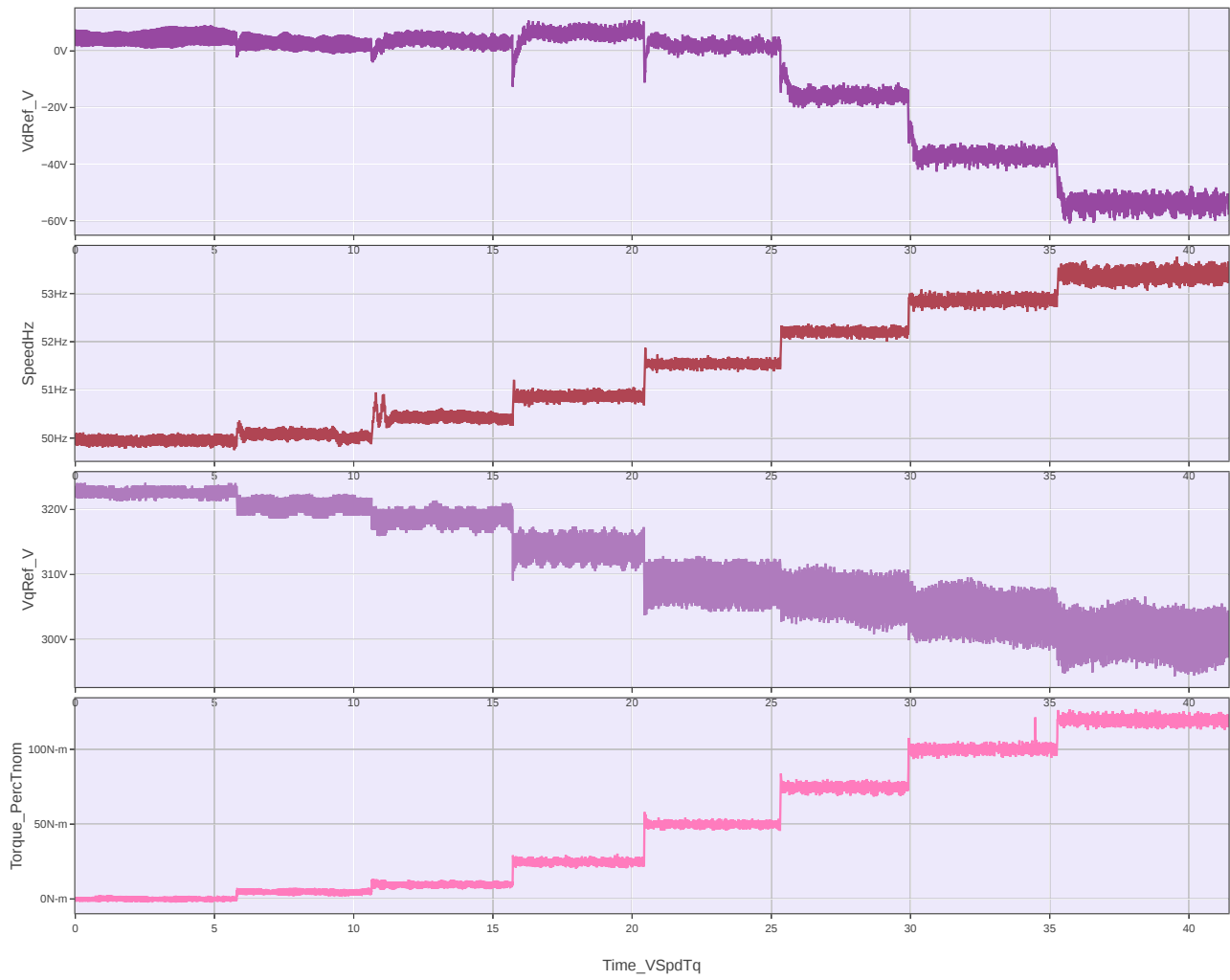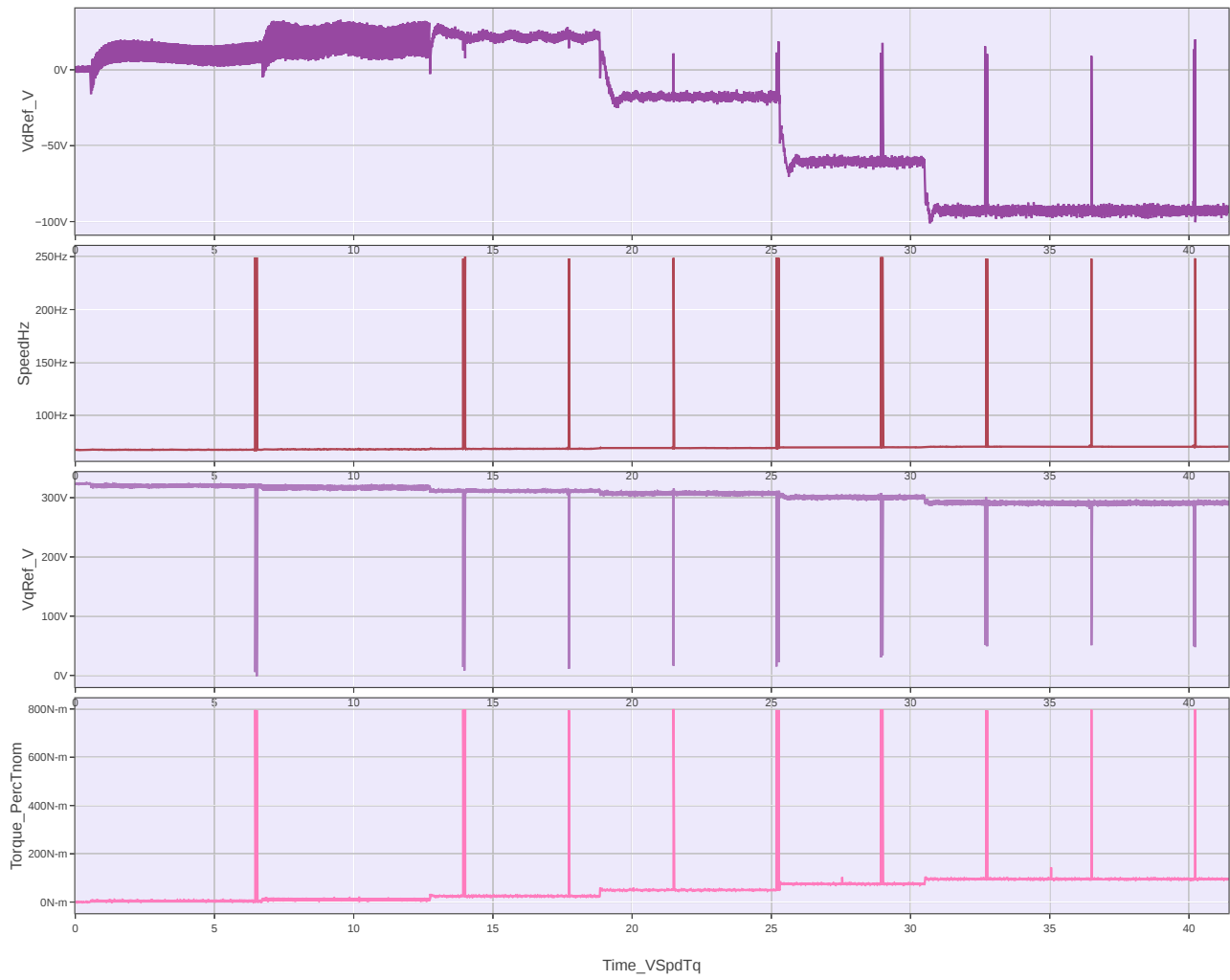Figure 2.8: lm50hz: voltage, torque and speed vs time
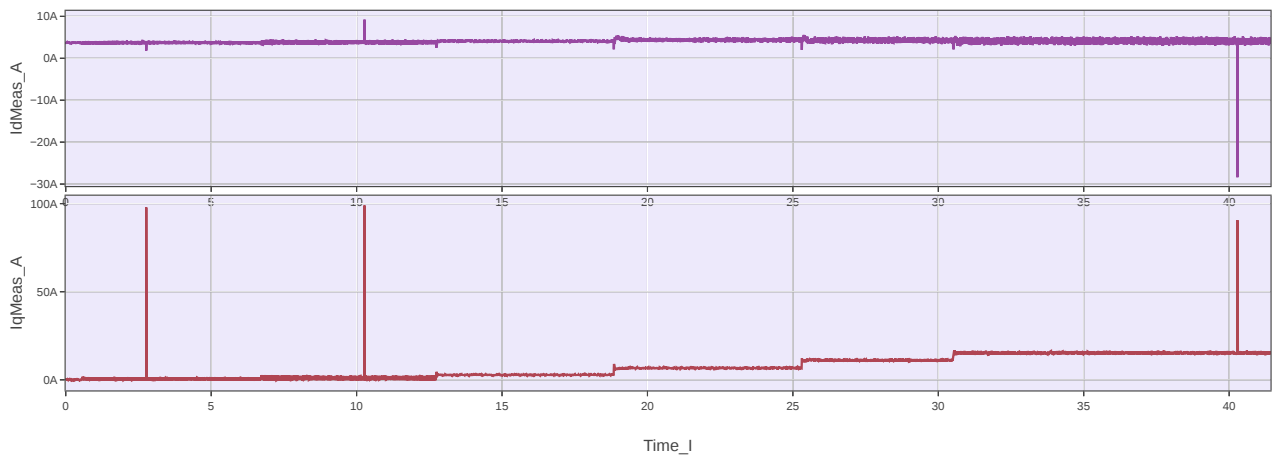
Figure 2.9: lm68hz: current vs time

Figure 2.10: lm68hz: voltage, torque and speed vs time