Appendix A. A scheme for quality estimation

The values used for the discriminating features among Q_0=1, 2, and 3 were mainly developed from experience in applying the MC model of Lepping et al. (1990). No thermodynamic properties, such as plasma beta, density, nor bulk speed, for example, are used. Three kinds of qualities, Q_0 for measurement: 1 for excellent/good, 2 for fair, and 3 for poor. Definition of these three qualities are listed as follows.

1. The Q_0=1 cases must satisfy all of the following criteria: |check|≤20%, $|\langle B_y \rangle_{Cl}| \leq$ 3.0 nT, ASF ≤30%, $45^\circ \leq \beta_{CA} \leq 135^\circ$, and $\chi_R \leq 0.165$. These are the "Q_0=1 set."
2. Q_0=3. This category arises from satisfying any one of the following: |Check|≥55%, |CA|≥97%, $\langle B_x \rangle_{Cl} \leq -1.5$ nT, f flag=NOT OK, Diameter ≥0.45 AU, ASF ≥40%, Cone angle (β_{CA})≤ 25° or $\beta_{CA} \geq 155°$, and $\chi_R \geq 0.215$.
3. Q_0=2. Case is nor satisfying the Q_0 = 1 criteria, neither falling into Q_0 = 3.

In which,

"Check" ≡ $(R_{\Delta T} - R_0)/R_0$, where $R_{\Delta T} = \sqrt{(Y^2_0 + (\sin\beta_{CA} V_C \Delta T/2)^2)}$,

and where R is the MC's radius, ΔT is the duration of MC-passage, V_C is the center speed of the MC (being close to the average speed across the cloud), β_{CA} is the angle between the MC's axis and the Sun-Earth line (where $\cos\beta_{CA} = \cos\varphi_A \cos\theta_A$: φ_A, θ_A are the longitude and latitude of the MC's axis, respectively), Y_0 is the estimated closest approach distance, and R_0 is the estimated MC radius. Note that CA ≡ $|Y_0|/R_0$ is the relative closest approach. That is, the value of the quantity "check" tests for consistency between two different means of obtaining estimates of the MC's radius, one directly from the fitting technique, where ΔT was not needed, and the other ($R_{\Delta T}$) requiring duration. Other useful quantities are:

ASF=$|(1–2t_0/\text{Duration})|$ x 100%, (Called the asymmetry factor, where 0% is excellent),

and consideration of the average field components (taken across the MC) in Cloud (Cl) coordinates, $\langle B_x \rangle_{Cl}$, $\langle B_y \rangle_{Cl}$, $\langle B_z \rangle_{Cl}$. Ideally $\langle B_x \rangle_{Cl}$ should be always positive and $\langle B_y \rangle_{Cl}$ should be zero, because of the definition of the MC coordinate system and the fundamental field structure of the force free structure. In the Cl system the X_{Cl}-axis is along the MC axis, positive in the direction of the positive polarity of the axial magnetic field, the Z_{Cl}-axis passes through the MC axis and is aligned with the projection of the trajectory of the spacecraft (relative to the MC velocity, which is approximately aligned with the X_{GSE}-axis) onto the cross-section of the MC, and $Y_{Cl} = Z_{Cl} \times X_{Cl}$ (see Appendix B in Lepping et al. 2020). The displacement of the B-field (or magnetic field) is the same as the measured velocity of the plasma indicated above. i.e., we may consider either the magnetic field frozen to the plasma or the plasma frozen in the magnetic field.

Appendix B

Figure B.1

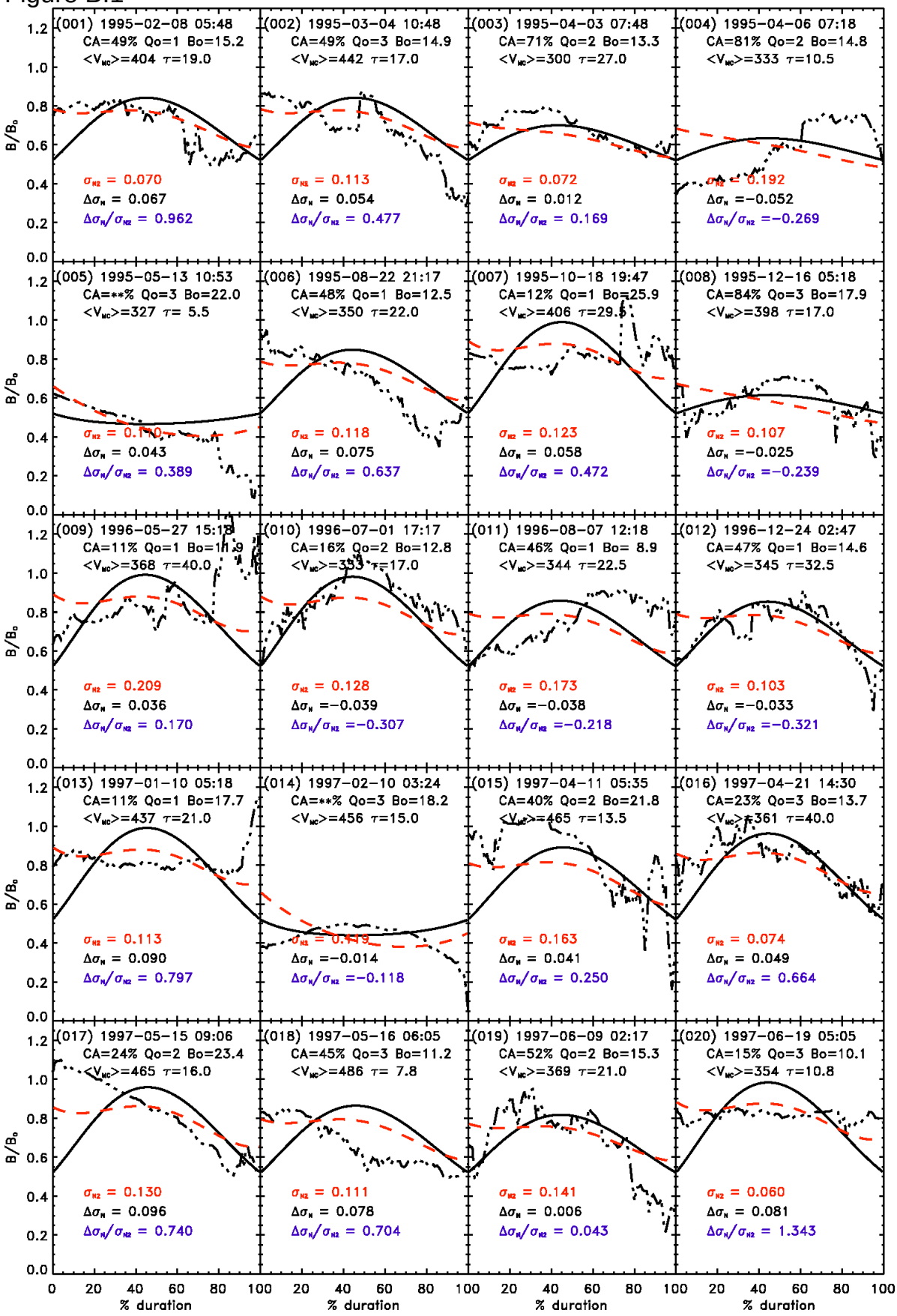


Figure B.2

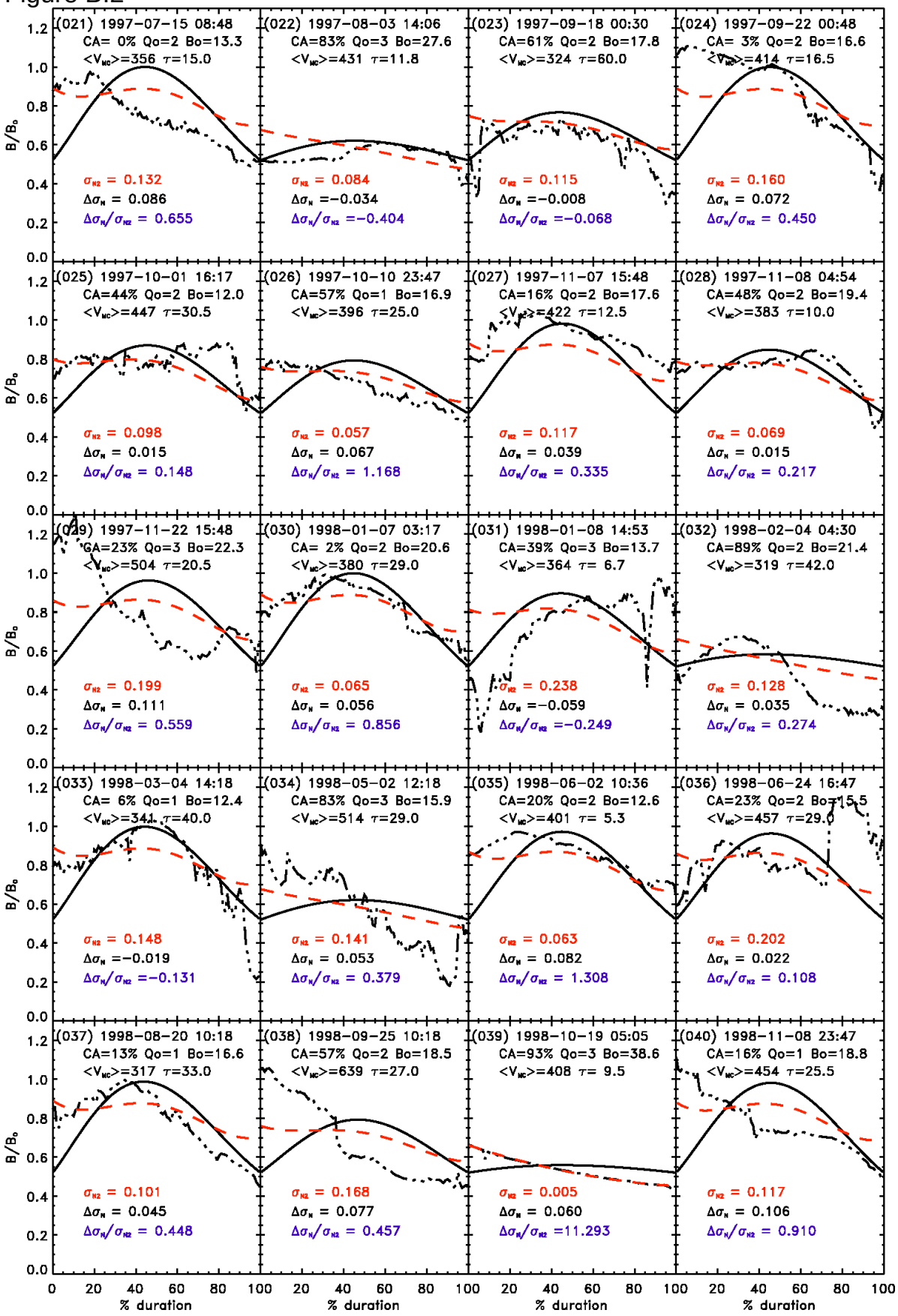

(021) 1997-07-15 08:48
CA= 0% Qo=2 Bo=13.3
<V_MC>=356 τ=15.0
σ_N2 = 0.132
Δσ_N = 0.086
Δσ_N/σ_N2 = 0.655
(022) 1997-08-03 14:06
CA=83% Qo=3 Bo=27.6
<V_MC>=431 τ=11.8
σ_N2 = 0.084
Δσ_N =-0.034
Δσ_N/σ_N2 =-0.404
(023) 1997-09-18 00:30
CA=61% Qo=2 Bo=17.8
<V_MC>=324 τ=60.0
σ_N2 = 0.115
Δσ_N =-0.008
Δσ_N/σ_N2 =-0.068
(024) 1997-09-22 00:48
CA= 3% Qo=2 Bo=16.6
<V_MC>=414 τ=16.5
σ_N2 = 0.160
Δσ_N = 0.072
Δσ_N/σ_N2 = 0.450
(025) 1997-10-01 16:17
CA=44% Qo=2 Bo=12.0
<V_MC>=447 τ=30.5
σ_N2 = 0.098
Δσ_N = 0.015
Δσ_N/σ_N2 = 0.148
(026) 1997-10-10 23:47
CA=57% Qo=1 Bo=16.9
<V_MC>=396 τ=25.0
σ_N2 = 0.057
Δσ_N = 0.067
Δσ_N/σ_N2 = 1.168
(027) 1997-11-07 15:48
CA=16% Qo=2 Bo=17.6
<V_MC>=422 τ=12.5
σ_N2 = 0.117
Δσ_N = 0.039
Δσ_N/σ_N2 = 0.335
(028) 1997-11-08 04:54
CA=48% Qo=2 Bo=19.4
<V_MC>=383 τ=10.0
σ_N2 = 0.069
Δσ_N = 0.015
Δσ_N/σ_N2 = 0.217
(029) 1997-11-22 15:48
CA=23% Qo=3 Bo=22.3
<V_MC>=504 τ=20.5
σ_N2 = 0.199
Δσ_N = 0.111
Δσ_N/σ_N2 = 0.559
(030) 1998-01-07 03:17
CA= 2% Qo=2 Bo=20.6
<V_MC>=380 τ=29.0
σ_N2 = 0.065
Δσ_N = 0.056
Δσ_N/σ_N2 = 0.856
(031) 1998-01-08 14:53
CA=39% Qo=3 Bo=13.7
<V_MC>=364 τ= 6.7
σ_N2 = 0.238
Δσ_N =-0.059
Δσ_N/σ_N2 =-0.249
(032) 1998-02-04 04:30
CA=89% Qo=2 Bo=21.4
<V_MC>=319 τ=42.0
σ_N2 = 0.128
Δσ_N = 0.035
Δσ_N/σ_N2 = 0.274
(033) 1998-03-04 14:18
CA= 6% Qo=1 Bo=12.4
<V_MC>=341 τ=40.0
σ_N2 = 0.148
Δσ_N =-0.019
Δσ_N/σ_N2 =-0.131
(034) 1998-05-02 12:18
CA=83% Qo=3 Bo=15.9
<V_MC>=514 τ=29.0
σ_N2 = 0.141
Δσ_N = 0.053
Δσ_N/σ_N2 = 0.379
(035) 1998-06-02 10:36
CA=20% Qo=2 Bo=12.6
<V_MC>=401 τ= 5.3
σ_N2 = 0.063
Δσ_N = 0.082
Δσ_N/σ_N2 = 1.308
(036) 1998-06-24 16:47
CA=23% Qo=2 Bo=15.5
<V_MC>=457 τ=29.0
σ_N2 = 0.202
Δσ_N = 0.022
Δσ_N/σ_N2 = 0.108
(037) 1998-08-20 10:18
CA=13% Qo=1 Bo=16.6
<V_MC>=317 τ=33.0
σ_N2 = 0.101
Δσ_N = 0.045
Δσ_N/σ_N2 = 0.448
(038) 1998-09-25 10:18
CA=57% Qo=2 Bo=18.5
<V_MC>=639 τ=27.0
σ_N2 = 0.168
Δσ_N = 0.077
Δσ_N/σ_N2 = 0.457
(039) 1998-10-19 05:05
CA=93% Qo=3 Bo=38.6
<V_MC>=408 τ= 9.5
σ_N2 = 0.005
Δσ_N = 0.060
Δσ_N/σ_N2 =11.293
(040) 1998-11-08 23:47
CA=16% Qo=1 Bo=18.8
<V_MC>=454 τ=25.5
σ_N2 = 0.117
Δσ_N = 0.106
Δσ_N/σ_N2 = 0.910
B/B_o
% duration

Figure B.3

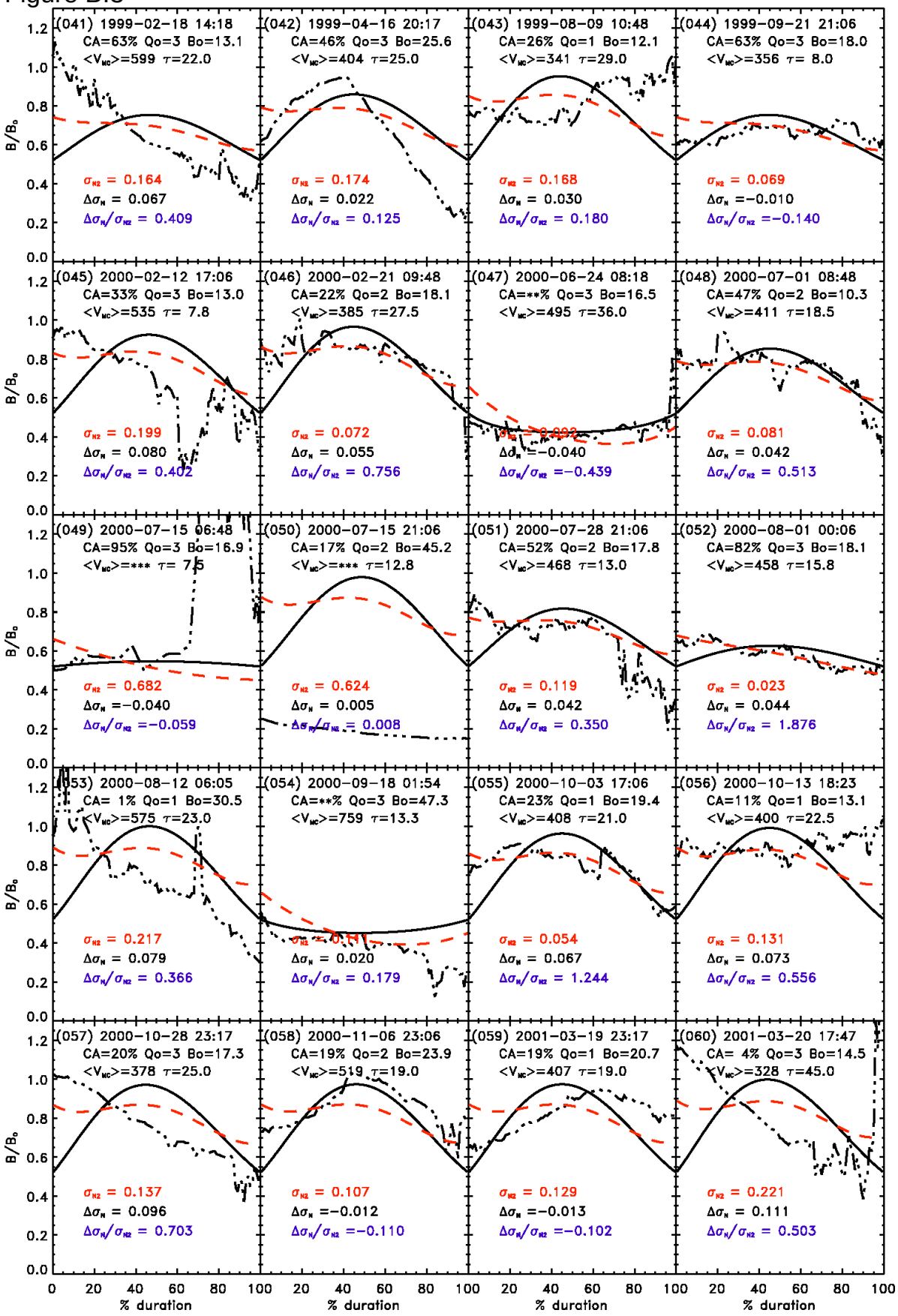

(041) 1999-02-18 14:18
CA=63% Qo=3 Bo=13.1
<V_MC>=599 τ=22.0
σ_N2 = 0.164
Δσ_N = 0.067
Δσ_N/σ_N2 = 0.409
(042) 1999-04-16 20:17
CA=46% Qo=3 Bo=25.6
<V_MC>=404 τ=25.0
σ_N2 = 0.174
Δσ_N = 0.022
Δσ_N/σ_N2 = 0.125
(043) 1999-08-09 10:48
CA=26% Qo=1 Bo=12.1
<V_MC>=341 τ=29.0
σ_N2 = 0.168
Δσ_N = 0.030
Δσ_N/σ_N2 = 0.180
(044) 1999-09-21 21:06
CA=63% Qo=3 Bo=18.0
<V_MC>=356 τ= 8.0
σ_N2 = 0.069
Δσ_N =-0.010
Δσ_N/σ_N2 =-0.140
(045) 2000-02-12 17:06
CA=33% Qo=3 Bo=13.0
<V_MC>=535 τ= 7.8
σ_N2 = 0.199
Δσ_N = 0.080
Δσ_N/σ_N2 = 0.402
(046) 2000-02-21 09:48
CA=22% Qo=2 Bo=18.1
<V_MC>=385 τ=27.5
σ_N2 = 0.072
Δσ_N = 0.055
Δσ_N/σ_N2 = 0.756
(047) 2000-06-24 08:18
CA=**% Qo=3 Bo=16.5
<V_MC>=495 τ=36.0
σ_N2 = 0.092
Δσ_N =-0.040
Δσ_N/σ_N2 =-0.439
(048) 2000-07-01 08:48
CA=47% Qo=2 Bo=10.3
<V_MC>=411 τ=18.5
σ_N2 = 0.081
Δσ_N = 0.042
Δσ_N/σ_N2 = 0.513
(049) 2000-07-15 06:48
CA=95% Qo=3 Bo=16.9
<V_MC>=*** τ= 7.5
σ_N2 = 0.682
Δσ_N =-0.040
Δσ_N/σ_N2 =-0.059
(050) 2000-07-15 21:06
CA=17% Qo=2 Bo=45.2
<V_MC>=*** τ=12.8
σ_N2 = 0.624
Δσ_N = 0.005
Δσ_N/σ_N2 = 0.008
(051) 2000-07-28 21:06
CA=52% Qo=2 Bo=17.8
<V_MC>=468 τ=13.0
σ_N2 = 0.119
Δσ_N = 0.042
Δσ_N/σ_N2 = 0.350
(052) 2000-08-01 00:06
CA=82% Qo=3 Bo=18.1
<V_MC>=458 τ=15.8
σ_N2 = 0.023
Δσ_N = 0.044
Δσ_N/σ_N2 = 1.876
(053) 2000-08-12 06:05
CA= 1% Qo=1 Bo=30.5
<V_MC>=575 τ=23.0
σ_N2 = 0.217
Δσ_N = 0.079
Δσ_N/σ_N2 = 0.366
(054) 2000-09-18 01:54
CA=**% Qo=3 Bo=47.3
<V_MC>=759 τ=13.3
σ_N2 = 0.111
Δσ_N = 0.020
Δσ_N/σ_N2 = 0.179
(055) 2000-10-03 17:06
CA=23% Qo=1 Bo=19.4
<V_MC>=408 τ=21.0
σ_N2 = 0.054
Δσ_N = 0.067
Δσ_N/σ_N2 = 1.244
(056) 2000-10-13 18:23
CA=11% Qo=1 Bo=13.1
<V_MC>=400 τ=22.5
σ_N2 = 0.131
Δσ_N = 0.073
Δσ_N/σ_N2 = 0.556
(057) 2000-10-28 23:17
CA=20% Qo=3 Bo=17.3
<V_MC>=378 τ=25.0
σ_N2 = 0.137
Δσ_N = 0.096
Δσ_N/σ_N2 = 0.703
(058) 2000-11-06 23:06
CA=19% Qo=2 Bo=23.9
<V_MC>=519 τ=19.0
σ_N2 = 0.107
Δσ_N =-0.012
Δσ_N/σ_N2 =-0.110
(059) 2001-03-19 23:17
CA=19% Qo=1 Bo=20.7
<V_MC>=407 τ=19.0
σ_N2 = 0.129
Δσ_N =-0.013
Δσ_N/σ_N2 =-0.102
(060) 2001-03-20 17:47
CA= 4% Qo=3 Bo=14.5
<V_MC>=328 τ=45.0
σ_N2 = 0.221
Δσ_N = 0.111
Δσ_N/σ_N2 = 0.503
B/B_o
% duration

Figure B.4

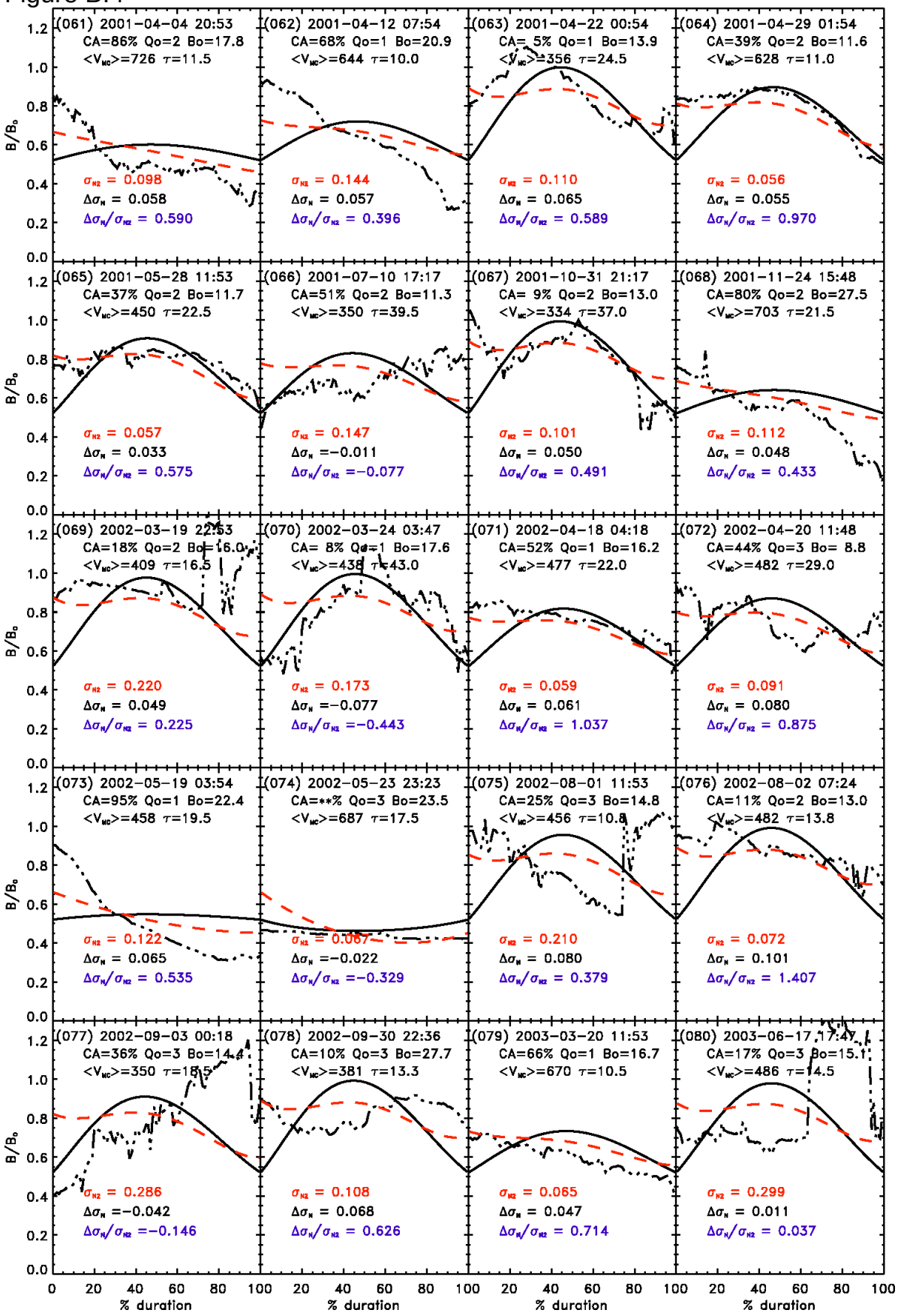

(061) 2001-04-04 20:53
CA=86% Qo=2 Bo=17.8
<V_MC>=726 τ=11.5
σ_N2 = 0.098
Δσ_N = 0.058
Δσ_N/σ_N2 = 0.590
(062) 2001-04-12 07:54
CA=68% Qo=1 Bo=20.9
<V_MC>=644 τ=10.0
σ_N2 = 0.144
Δσ_N = 0.057
Δσ_N/σ_N2 = 0.396
(063) 2001-04-22 00:54
CA= 5% Qo=1 Bo=13.9
<V_MC>=356 τ=24.5
σ_N2 = 0.110
Δσ_N = 0.065
Δσ_N/σ_N2 = 0.589
(064) 2001-04-29 01:54
CA=39% Qo=2 Bo=11.6
<V_MC>=628 τ=11.0
σ_N2 = 0.056
Δσ_N = 0.055
Δσ_N/σ_N2 = 0.970
(065) 2001-05-28 11:53
CA=37% Qo=2 Bo=11.7
<V_MC>=450 τ=22.5
σ_N2 = 0.057
Δσ_N = 0.033
Δσ_N/σ_N2 = 0.575
(066) 2001-07-10 17:17
CA=51% Qo=2 Bo=11.3
<V_MC>=350 τ=39.5
σ_N2 = 0.147
Δσ_N =-0.011
Δσ_N/σ_N2 =-0.077
(067) 2001-10-31 21:17
CA= 9% Qo=2 Bo=13.0
<V_MC>=334 τ=37.0
σ_N2 = 0.101
Δσ_N = 0.050
Δσ_N/σ_N2 = 0.491
(068) 2001-11-24 15:48
CA=80% Qo=2 Bo=27.5
<V_MC>=703 τ=21.5
σ_N2 = 0.112
Δσ_N = 0.048
Δσ_N/σ_N2 = 0.433
(069) 2002-03-19 22:53
CA=18% Qo=2 Bo=16.0
<V_MC>=409 τ=16.5
σ_N2 = 0.220
Δσ_N = 0.049
Δσ_N/σ_N2 = 0.225
(070) 2002-03-24 03:47
CA= 8% Qo=1 Bo=17.6
<V_MC>=438 τ=43.0
σ_N2 = 0.173
Δσ_N =-0.077
Δσ_N/σ_N2 =-0.443
(071) 2002-04-18 04:18
CA=52% Qo=1 Bo=16.2
<V_MC>=477 τ=22.0
σ_N2 = 0.059
Δσ_N = 0.061
Δσ_N/σ_N2 = 1.037
(072) 2002-04-20 11:48
CA=44% Qo=3 Bo= 8.8
<V_MC>=482 τ=29.0
σ_N2 = 0.091
Δσ_N = 0.080
Δσ_N/σ_N2 = 0.875
(073) 2002-05-19 03:54
CA=95% Qo=1 Bo=22.4
<V_MC>=458 τ=19.5
σ_N2 = 0.122
Δσ_N = 0.065
Δσ_N/σ_N2 = 0.535
(074) 2002-05-23 23:23
CA=**% Qo=3 Bo=23.5
<V_MC>=687 τ=17.5
σ_N2 = 0.067
Δσ_N =-0.022
Δσ_N/σ_N2 =-0.329
(075) 2002-08-01 11:53
CA=25% Qo=3 Bo=14.8
<V_MC>=456 τ=10.8
σ_N2 = 0.210
Δσ_N = 0.080
Δσ_N/σ_N2 = 0.379
(076) 2002-08-02 07:24
CA=11% Qo=2 Bo=13.0
<V_MC>=482 τ=13.8
σ_N2 = 0.072
Δσ_N = 0.101
Δσ_N/σ_N2 = 1.407
(077) 2002-09-03 00:18
CA=36% Qo=3 Bo=14.4
<V_MC>=350 τ=18.5
σ_N2 = 0.286
Δσ_N =-0.042
Δσ_N/σ_N2 =-0.146
(078) 2002-09-30 22:36
CA=10% Qo=3 Bo=27.7
<V_MC>=381 τ=13.3
σ_N2 = 0.108
Δσ_N = 0.068
Δσ_N/σ_N2 = 0.626
(079) 2003-03-20 11:53
CA=66% Qo=1 Bo=16.7
<V_MC>=670 τ=10.5
σ_N2 = 0.065
Δσ_N = 0.047
Δσ_N/σ_N2 = 0.714
(080) 2003-06-17 17:47
CA=17% Qo=3 Bo=15.1
<V_MC>=486 τ=14.5
σ_N2 = 0.299
Δσ_N = 0.011
Δσ_N/σ_N2 = 0.037
B/B_o
% duration

Figure B.5

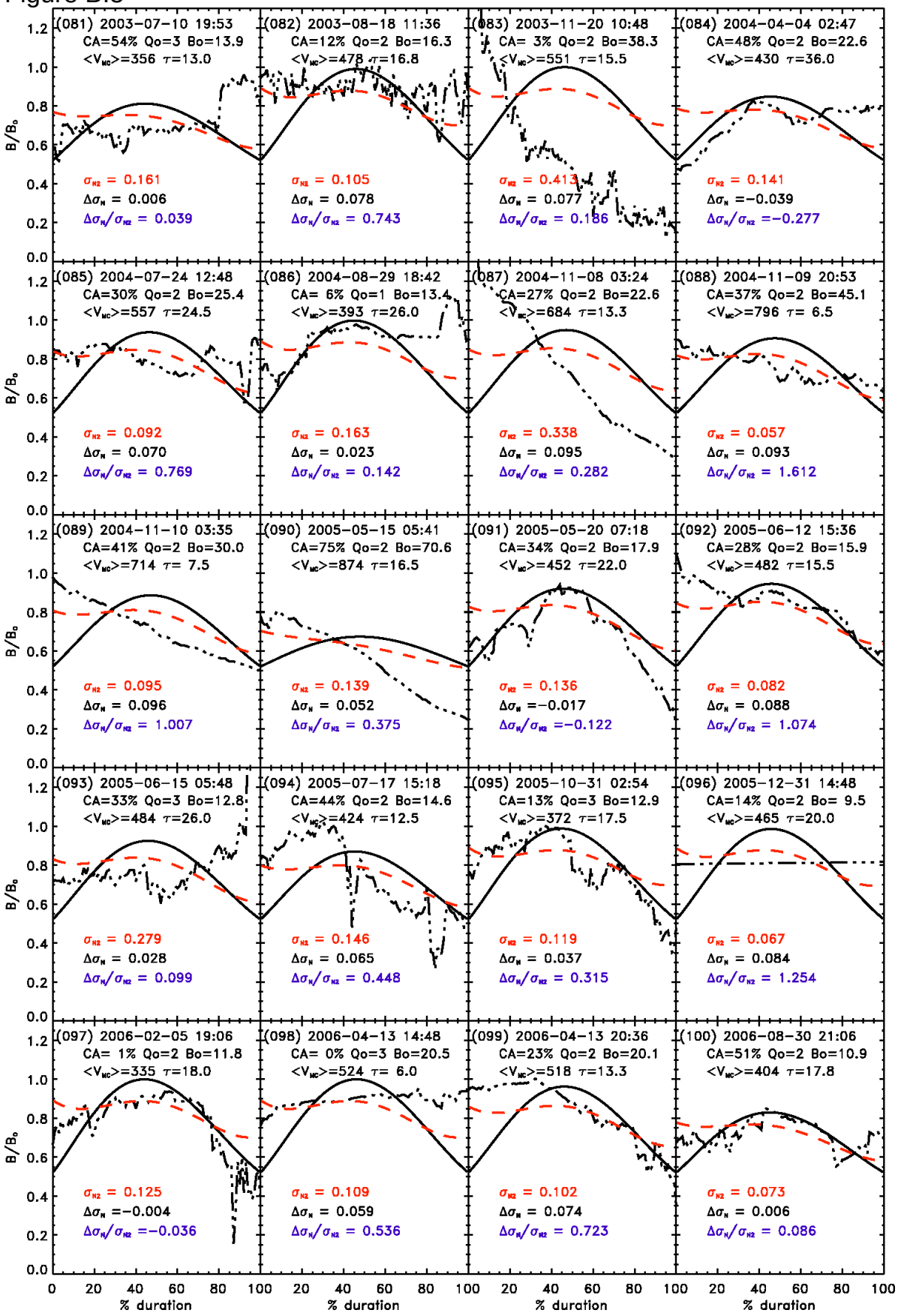

(081) 2003-07-10 19:53
CA=54% Qo=3 Bo=13.9
<V_MC>=356 τ=13.0
σ_N2 = 0.161
Δσ_N = 0.006
Δσ_N/σ_N2 = 0.039
(082) 2003-08-18 11:36
CA=12% Qo=2 Bo=16.3
<V_MC>=478 τ=16.8
σ_N2 = 0.105
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.743
(083) 2003-11-20 10:48
CA= 3% Qo=2 Bo=38.3
<V_MC>=551 τ=15.5
σ_N2 = 0.413
Δσ_N = 0.077
Δσ_N/σ_N2 = 0.186
(084) 2004-04-04 02:47
CA=48% Qo=2 Bo=22.6
<V_MC>=430 τ=36.0
σ_N2 = 0.141
Δσ_N =-0.039
Δσ_N/σ_N2 =-0.277
(085) 2004-07-24 12:48
CA=30% Qo=2 Bo=25.4
<V_MC>=557 τ=24.5
σ_N2 = 0.092
Δσ_N = 0.070
Δσ_N/σ_N2 = 0.769
(086) 2004-08-29 18:42
CA= 6% Qo=1 Bo=13.4
<V_MC>=393 τ=26.0
σ_N2 = 0.163
Δσ_N = 0.023
Δσ_N/σ_N2 = 0.142
(087) 2004-11-08 03:24
CA=27% Qo=2 Bo=22.6
<V_MC>=684 τ=13.3
σ_N2 = 0.338
Δσ_N = 0.095
Δσ_N/σ_N2 = 0.282
(088) 2004-11-09 20:53
CA=37% Qo=2 Bo=45.1
<V_MC>=796 τ= 6.5
σ_N2 = 0.057
Δσ_N = 0.093
Δσ_N/σ_N2 = 1.612
(089) 2004-11-10 03:35
CA=41% Qo=2 Bo=30.0
<V_MC>=714 τ= 7.5
σ_N2 = 0.095
Δσ_N = 0.096
Δσ_N/σ_N2 = 1.007
(090) 2005-05-15 05:41
CA=75% Qo=2 Bo=70.6
<V_MC>=874 τ=16.5
σ_N2 = 0.139
Δσ_N = 0.052
Δσ_N/σ_N2 = 0.375
(091) 2005-05-20 07:18
CA=34% Qo=2 Bo=17.9
<V_MC>=452 τ=22.0
σ_N2 = 0.136
Δσ_N =-0.017
Δσ_N/σ_N2 =-0.122
(092) 2005-06-12 15:36
CA=28% Qo=2 Bo=15.9
<V_MC>=482 τ=15.5
σ_N2 = 0.082
Δσ_N = 0.088
Δσ_N/σ_N2 = 1.074
(093) 2005-06-15 05:48
CA=33% Qo=3 Bo=12.8
<V_MC>=484 τ=26.0
σ_N2 = 0.279
Δσ_N = 0.028
Δσ_N/σ_N2 = 0.099
(094) 2005-07-17 15:18
CA=44% Qo=2 Bo=14.6
<V_MC>=424 τ=12.5
σ_N2 = 0.146
Δσ_N = 0.065
Δσ_N/σ_N2 = 0.448
(095) 2005-10-31 02:54
CA=13% Qo=3 Bo=12.9
<V_MC>=372 τ=17.5
σ_N2 = 0.119
Δσ_N = 0.037
Δσ_N/σ_N2 = 0.315
(096) 2005-12-31 14:48
CA=14% Qo=2 Bo= 9.5
<V_MC>=465 τ=20.0
σ_N2 = 0.067
Δσ_N = 0.084
Δσ_N/σ_N2 = 1.254
(097) 2006-02-05 19:06
CA= 1% Qo=2 Bo=11.8
<V_MC>=335 τ=18.0
σ_N2 = 0.125
Δσ_N =-0.004
Δσ_N/σ_N2 =-0.036
(098) 2006-04-13 14:48
CA= 0% Qo=3 Bo=20.5
<V_MC>=524 τ= 6.0
σ_N2 = 0.109
Δσ_N = 0.059
Δσ_N/σ_N2 = 0.536
(099) 2006-04-13 20:36
CA=23% Qo=2 Bo=20.1
<V_MC>=518 τ=13.3
σ_N2 = 0.102
Δσ_N = 0.074
Δσ_N/σ_N2 = 0.723
(100) 2006-08-30 21:06
CA=51% Qo=2 Bo=10.9
<V_MC>=404 τ=17.8
σ_N2 = 0.073
Δσ_N = 0.006
Δσ_N/σ_N2 = 0.086
B/B_o
% duration

Figure B.6

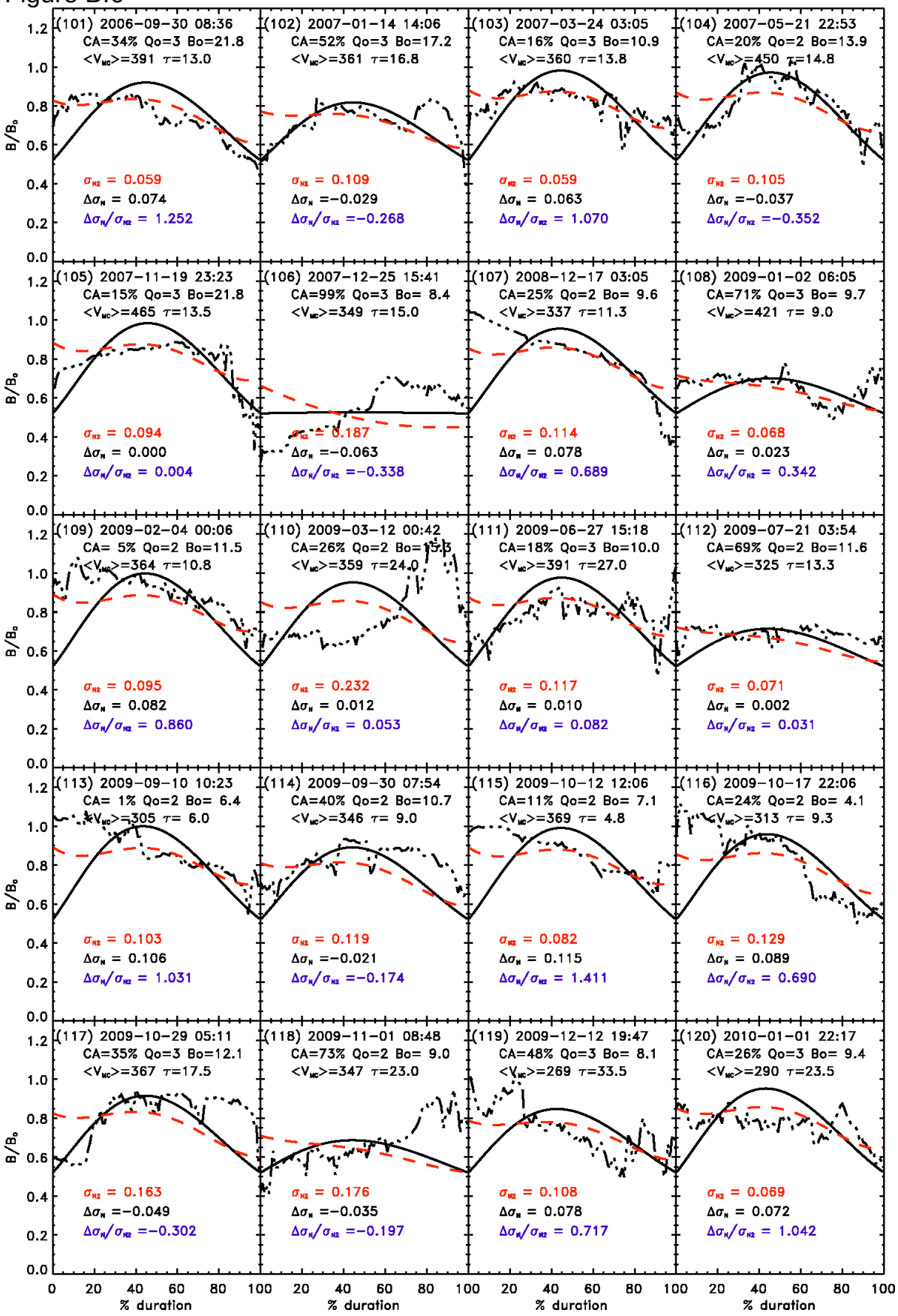

(101) 2006-09-30 08:36
CA=34% Qo=3 Bo=21.8
<V_MC>=391 τ=13.0
σ_N2 = 0.059
Δσ_N = 0.074
Δσ_N/σ_N2 = 1.252
(102) 2007-01-14 14:06
CA=52% Qo=3 Bo=17.2
<V_MC>=361 τ=16.8
σ_N2 = 0.109
Δσ_N =-0.029
Δσ_N/σ_N2 =-0.268
(103) 2007-03-24 03:05
CA=16% Qo=3 Bo=10.9
<V_MC>=360 τ=13.8
σ_N2 = 0.059
Δσ_N = 0.063
Δσ_N/σ_N2 = 1.070
(104) 2007-05-21 22:53
CA=20% Qo=2 Bo=13.9
<V_MC>=450 τ=14.8
σ_N2 = 0.105
Δσ_N =-0.037
Δσ_N/σ_N2 =-0.352
(105) 2007-11-19 23:23
CA=15% Qo=3 Bo=21.8
<V_MC>=465 τ=13.5
σ_N2 = 0.094
Δσ_N = 0.000
Δσ_N/σ_N2 = 0.004
(106) 2007-12-25 15:41
CA=99% Qo=3 Bo= 8.4
<V_MC>=349 τ=15.0
σ_N2 = 0.187
Δσ_N =-0.063
Δσ_N/σ_N2 =-0.338
(107) 2008-12-17 03:05
CA=25% Qo=2 Bo= 9.6
<V_MC>=337 τ=11.3
σ_N2 = 0.114
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.689
(108) 2009-01-02 06:05
CA=71% Qo=3 Bo= 9.7
<V_MC>=421 τ= 9.0
σ_N2 = 0.068
Δσ_N = 0.023
Δσ_N/σ_N2 = 0.342
(109) 2009-02-04 00:06
CA= 5% Qo=2 Bo=11.5
<V_MC>=364 τ=10.8
σ_N2 = 0.095
Δσ_N = 0.082
Δσ_N/σ_N2 = 0.860
(110) 2009-03-12 00:42
CA=26% Qo=2 Bo=15.3
<V_MC>=359 τ=24.0
σ_N2 = 0.232
Δσ_N = 0.012
Δσ_N/σ_N2 = 0.053
(111) 2009-06-27 15:18
CA=18% Qo=3 Bo=10.0
<V_MC>=391 τ=27.0
σ_N2 = 0.117
Δσ_N = 0.010
Δσ_N/σ_N2 = 0.082
(112) 2009-07-21 03:54
CA=69% Qo=2 Bo=11.6
<V_MC>=325 τ=13.3
σ_N2 = 0.071
Δσ_N = 0.002
Δσ_N/σ_N2 = 0.031
(113) 2009-09-10 10:23
CA= 1% Qo=2 Bo= 6.4
<V_MC>=305 τ= 6.0
σ_N2 = 0.103
Δσ_N = 0.106
Δσ_N/σ_N2 = 1.031
(114) 2009-09-30 07:54
CA=40% Qo=2 Bo=10.7
<V_MC>=346 τ= 9.0
σ_N2 = 0.119
Δσ_N =-0.021
Δσ_N/σ_N2 =-0.174
(115) 2009-10-12 12:06
CA=11% Qo=2 Bo= 7.1
<V_MC>=369 τ= 4.8
σ_N2 = 0.082
Δσ_N = 0.115
Δσ_N/σ_N2 = 1.411
(116) 2009-10-17 22:06
CA=24% Qo=2 Bo= 4.1
<V_MC>=313 τ= 9.3
σ_N2 = 0.129
Δσ_N = 0.089
Δσ_N/σ_N2 = 0.690
(117) 2009-10-29 05:11
CA=35% Qo=3 Bo=12.1
<V_MC>=367 τ=17.5
σ_N2 = 0.163
Δσ_N =-0.049
Δσ_N/σ_N2 =-0.302
(118) 2009-11-01 08:48
CA=73% Qo=2 Bo= 9.0
<V_MC>=347 τ=23.0
σ_N2 = 0.176
Δσ_N =-0.035
Δσ_N/σ_N2 =-0.197
(119) 2009-12-12 19:47
CA=48% Qo=3 Bo= 8.1
<V_MC>=269 τ=33.5
σ_N2 = 0.108
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.717
(120) 2010-01-01 22:17
CA=26% Qo=3 Bo= 9.4
<V_MC>=290 τ=23.5
σ_N2 = 0.069
Δσ_N = 0.072
Δσ_N/σ_N2 = 1.042
B/B_o
% duration

Figure B.7

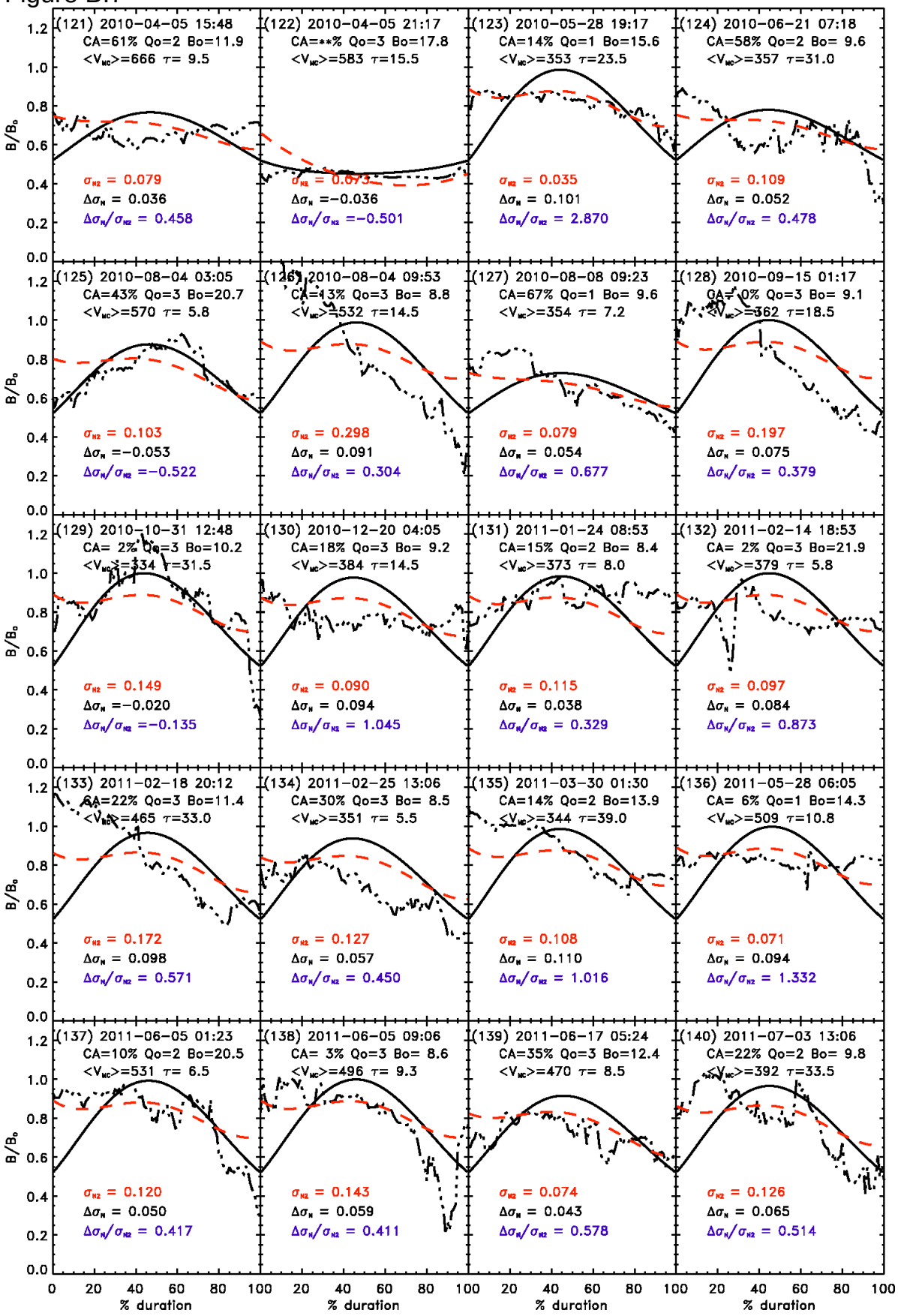

(121) 2010-04-05 15:48
CA=61% Qo=2 Bo=11.9
<V_MC>=666 τ= 9.5
σ_N2 = 0.079
Δσ_N = 0.036
Δσ_N/σ_N2 = 0.458
(122) 2010-04-05 21:17
CA=**% Qo=3 Bo=17.8
<V_MC>=583 τ=15.5
σ_N2 = 0.073
Δσ_N =-0.036
Δσ_N/σ_N2 =-0.501
(123) 2010-05-28 19:17
CA=14% Qo=1 Bo=15.6
<V_MC>=353 τ=23.5
σ_N2 = 0.035
Δσ_N = 0.101
Δσ_N/σ_N2 = 2.870
(124) 2010-06-21 07:18
CA=58% Qo=2 Bo= 9.6
<V_MC>=357 τ=31.0
σ_N2 = 0.109
Δσ_N = 0.052
Δσ_N/σ_N2 = 0.478
(125) 2010-08-04 03:05
CA=43% Qo=3 Bo=20.7
<V_MC>=570 τ= 5.8
σ_N2 = 0.103
Δσ_N =-0.053
Δσ_N/σ_N2 =-0.522
(126) 2010-08-04 09:53
CA=13% Qo=3 Bo= 8.8
<V_MC>=532 τ=14.5
σ_N2 = 0.298
Δσ_N = 0.091
Δσ_N/σ_N2 = 0.304
(127) 2010-08-08 09:23
CA=67% Qo=1 Bo= 9.6
<V_MC>=354 τ= 7.2
σ_N2 = 0.079
Δσ_N = 0.054
Δσ_N/σ_N2 = 0.677
(128) 2010-09-15 01:17
CA= 0% Qo=3 Bo= 9.1
<V_MC>=362 τ=18.5
σ_N2 = 0.197
Δσ_N = 0.075
Δσ_N/σ_N2 = 0.379
(129) 2010-10-31 12:48
CA= 2% Qo=3 Bo=10.2
<V_MC>=334 τ=31.5
σ_N2 = 0.149
Δσ_N =-0.020
Δσ_N/σ_N2 =-0.135
(130) 2010-12-20 04:05
CA=18% Qo=3 Bo= 9.2
<V_MC>=384 τ=14.5
σ_N2 = 0.090
Δσ_N = 0.094
Δσ_N/σ_N2 = 1.045
(131) 2011-01-24 08:53
CA=15% Qo=2 Bo= 8.4
<V_MC>=373 τ= 8.0
σ_N2 = 0.115
Δσ_N = 0.038
Δσ_N/σ_N2 = 0.329
(132) 2011-02-14 18:53
CA= 2% Qo=3 Bo=21.9
<V_MC>=379 τ= 5.8
σ_N2 = 0.097
Δσ_N = 0.084
Δσ_N/σ_N2 = 0.873
(133) 2011-02-18 20:12
CA=22% Qo=3 Bo=11.4
<V_MC>=465 τ=33.0
σ_N2 = 0.172
Δσ_N = 0.098
Δσ_N/σ_N2 = 0.571
(134) 2011-02-25 13:06
CA=30% Qo=3 Bo= 8.5
<V_MC>=351 τ= 5.5
σ_N2 = 0.127
Δσ_N = 0.057
Δσ_N/σ_N2 = 0.450
(135) 2011-03-30 01:30
CA=14% Qo=2 Bo=13.9
<V_MC>=344 τ=39.0
σ_N2 = 0.108
Δσ_N = 0.110
Δσ_N/σ_N2 = 1.016
(136) 2011-05-28 06:05
CA= 6% Qo=1 Bo=14.3
<V_MC>=509 τ=10.8
σ_N2 = 0.071
Δσ_N = 0.094
Δσ_N/σ_N2 = 1.332
(137) 2011-06-05 01:23
CA=10% Qo=2 Bo=20.5
<V_MC>=531 τ= 6.5
σ_N2 = 0.120
Δσ_N = 0.050
Δσ_N/σ_N2 = 0.417
(138) 2011-06-05 09:06
CA= 3% Qo=3 Bo= 8.6
<V_MC>=496 τ= 9.3
σ_N2 = 0.143
Δσ_N = 0.059
Δσ_N/σ_N2 = 0.411
(139) 2011-06-17 05:24
CA=35% Qo=3 Bo=12.4
<V_MC>=470 τ= 8.5
σ_N2 = 0.074
Δσ_N = 0.043
Δσ_N/σ_N2 = 0.578
(140) 2011-07-03 13:06
CA=22% Qo=2 Bo= 9.8
<V_MC>=392 τ=33.5
σ_N2 = 0.126
Δσ_N = 0.065
Δσ_N/σ_N2 = 0.514
B/B_o
% duration

Figure B.8

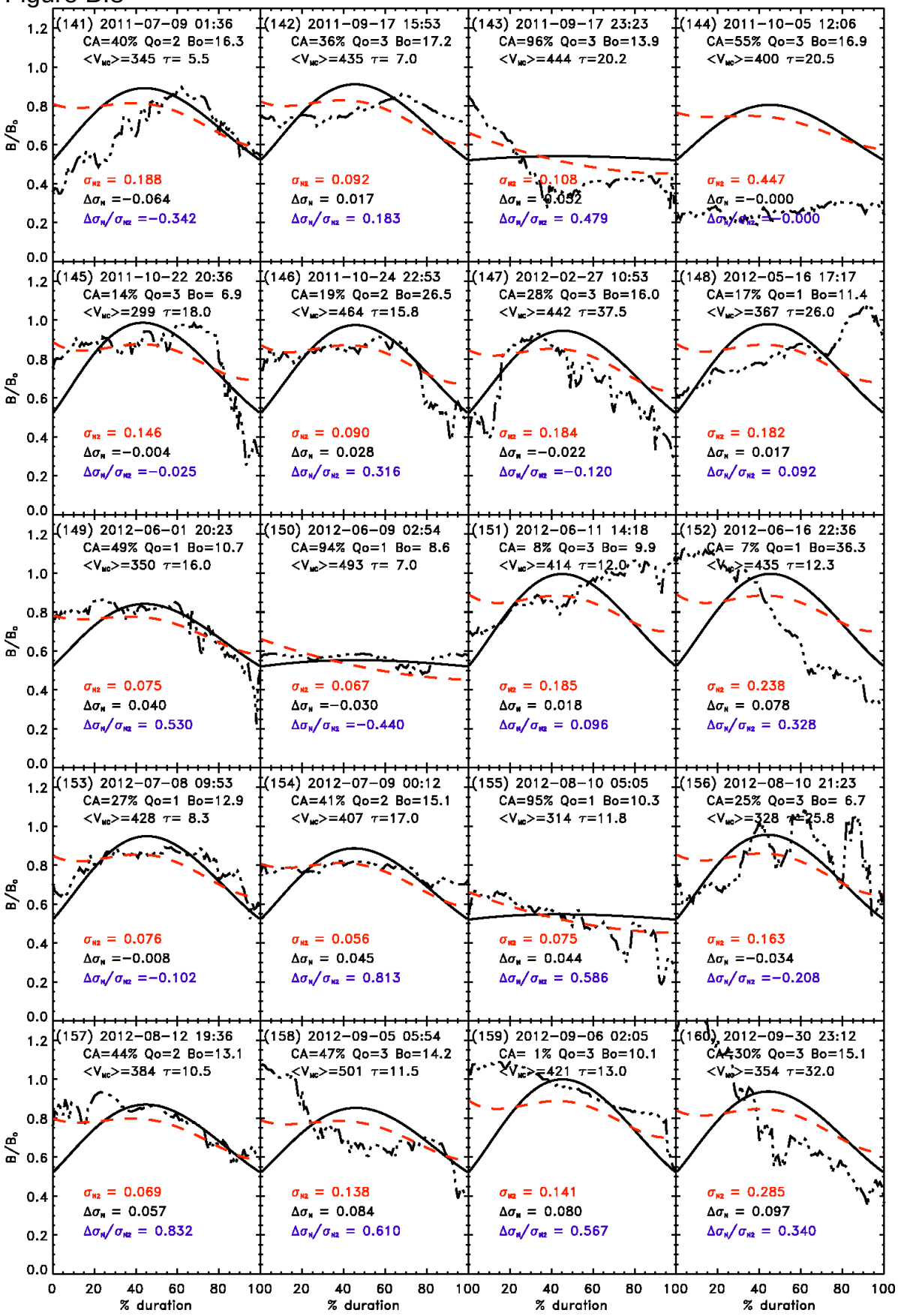

(141) 2011-07-09 01:36
CA=40% Qo=2 Bo=16.3
<V_MC>=345 τ= 5.5
σ_N2 = 0.188
Δσ_N =-0.064
Δσ_N/σ_N2 =-0.342
(142) 2011-09-17 15:53
CA=36% Qo=3 Bo=17.2
<V_MC>=435 τ= 7.0
σ_N2 = 0.092
Δσ_N = 0.017
Δσ_N/σ_N2 = 0.183
(143) 2011-09-17 23:23
CA=96% Qo=3 Bo=13.9
<V_MC>=444 τ=20.2
σ_N2 = 0.108
Δσ_N = 0.052
Δσ_N/σ_N2 = 0.479
(144) 2011-10-05 12:06
CA=55% Qo=3 Bo=16.9
<V_MC>=400 τ=20.5
σ_N2 = 0.447
Δσ_N =-0.000
Δσ_N/σ_N2 =-0.000
(145) 2011-10-22 20:36
CA=14% Qo=3 Bo= 6.9
<V_MC>=299 τ=18.0
σ_N2 = 0.146
Δσ_N =-0.004
Δσ_N/σ_N2 =-0.025
(146) 2011-10-24 22:53
CA=19% Qo=2 Bo=26.5
<V_MC>=464 τ=15.8
σ_N2 = 0.090
Δσ_N = 0.028
Δσ_N/σ_N2 = 0.316
(147) 2012-02-27 10:53
CA=28% Qo=3 Bo=16.0
<V_MC>=442 τ=37.5
σ_N2 = 0.184
Δσ_N =-0.022
Δσ_N/σ_N2 =-0.120
(148) 2012-05-16 17:17
CA=17% Qo=1 Bo=11.4
<V_MC>=367 τ=26.0
σ_N2 = 0.182
Δσ_N = 0.017
Δσ_N/σ_N2 = 0.092
(149) 2012-06-01 20:23
CA=49% Qo=1 Bo=10.7
<V_MC>=350 τ=16.0
σ_N2 = 0.075
Δσ_N = 0.040
Δσ_N/σ_N2 = 0.530
(150) 2012-06-09 02:54
CA=94% Qo=1 Bo= 8.6
<V_MC>=493 τ= 7.0
σ_N2 = 0.067
Δσ_N =-0.030
Δσ_N/σ_N2 =-0.440
(151) 2012-06-11 14:18
CA= 8% Qo=3 Bo= 9.9
<V_MC>=414 τ=12.0
σ_N2 = 0.185
Δσ_N = 0.018
Δσ_N/σ_N2 = 0.096
(152) 2012-06-16 22:36
CA= 7% Qo=1 Bo=36.3
<V_MC>=435 τ=12.3
σ_N2 = 0.238
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.328
(153) 2012-07-08 09:53
CA=27% Qo=1 Bo=12.9
<V_MC>=428 τ= 8.3
σ_N2 = 0.076
Δσ_N =-0.008
Δσ_N/σ_N2 =-0.102
(154) 2012-07-09 00:12
CA=41% Qo=2 Bo=15.1
<V_MC>=407 τ=17.0
σ_N2 = 0.056
Δσ_N = 0.045
Δσ_N/σ_N2 = 0.813
(155) 2012-08-10 05:05
CA=95% Qo=1 Bo=10.3
<V_MC>=314 τ=11.8
σ_N2 = 0.075
Δσ_N = 0.044
Δσ_N/σ_N2 = 0.586
(156) 2012-08-10 21:23
CA=25% Qo=3 Bo= 6.7
<V_MC>=328 τ=25.8
σ_N2 = 0.163
Δσ_N =-0.034
Δσ_N/σ_N2 =-0.208
(157) 2012-08-12 19:36
CA=44% Qo=2 Bo=13.1
<V_MC>=384 τ=10.5
σ_N2 = 0.069
Δσ_N = 0.057
Δσ_N/σ_N2 = 0.832
(158) 2012-09-05 05:54
CA=47% Qo=3 Bo=14.2
<V_MC>=501 τ=11.5
σ_N2 = 0.138
Δσ_N = 0.084
Δσ_N/σ_N2 = 0.610
(159) 2012-09-06 02:05
CA= 1% Qo=3 Bo=10.1
<V_MC>=421 τ=13.0
σ_N2 = 0.141
Δσ_N = 0.080
Δσ_N/σ_N2 = 0.567
(160) 2012-09-30 23:12
CA=30% Qo=3 Bo=15.1
<V_MC>=354 τ=32.0
σ_N2 = 0.285
Δσ_N = 0.097
Δσ_N/σ_N2 = 0.340
B/B_o
% duration

Figure B.9

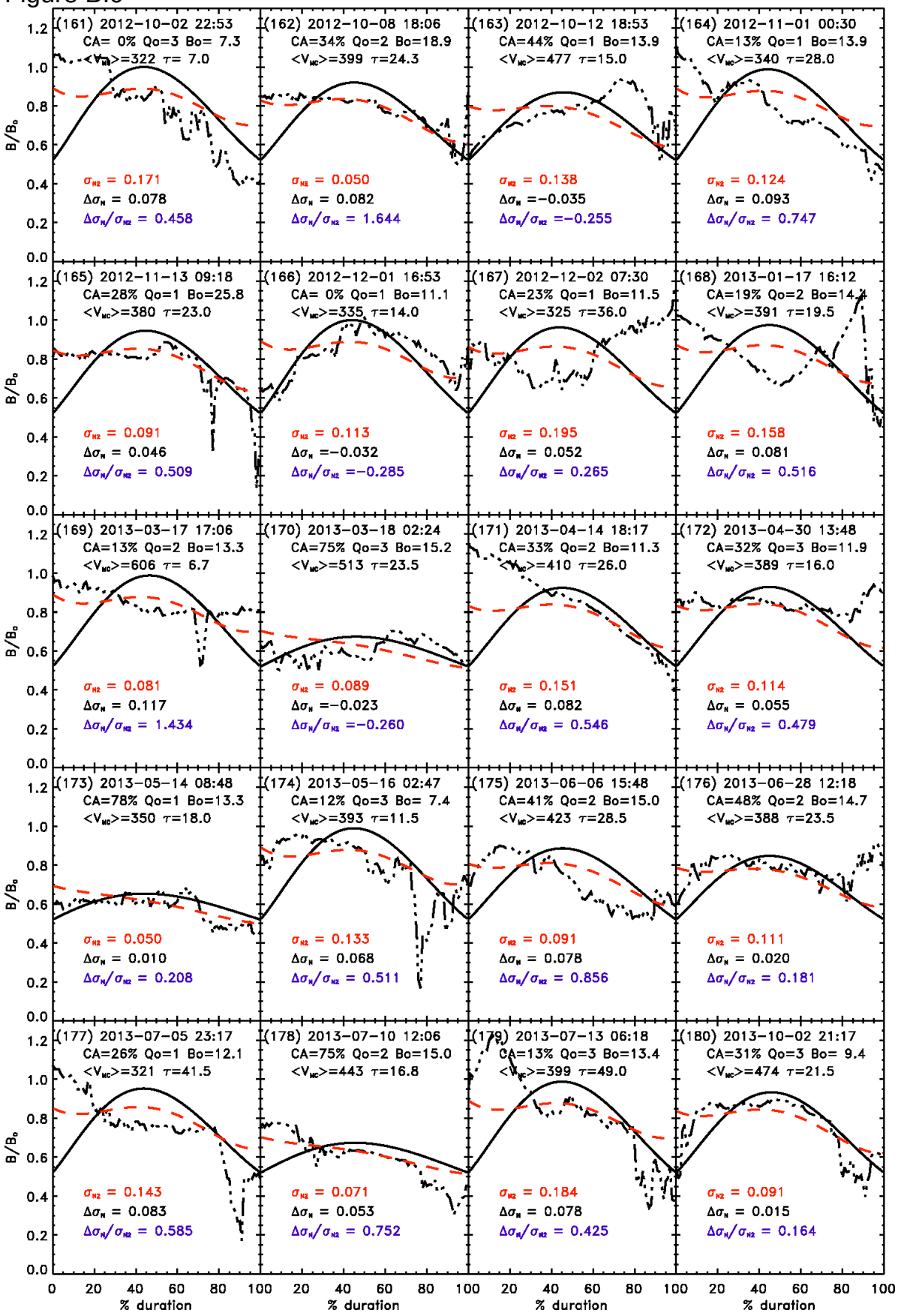

(161) 2012-10-02 22:53
CA= 0% Qo=3 Bo= 7.3
<V_MC>=322 τ= 7.0
σ_N2 = 0.171
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.458
(162) 2012-10-08 18:06
CA=34% Qo=2 Bo=18.9
<V_MC>=399 τ=24.3
σ_N2 = 0.050
Δσ_N = 0.082
Δσ_N/σ_N2 = 1.644
(163) 2012-10-12 18:53
CA=44% Qo=1 Bo=13.9
<V_MC>=477 τ=15.0
σ_N2 = 0.138
Δσ_N =-0.035
Δσ_N/σ_N2 =-0.255
(164) 2012-11-01 00:30
CA=13% Qo=1 Bo=13.9
<V_MC>=340 τ=28.0
σ_N2 = 0.124
Δσ_N = 0.093
Δσ_N/σ_N2 = 0.747
(165) 2012-11-13 09:18
CA=28% Qo=1 Bo=25.8
<V_MC>=380 τ=23.0
σ_N2 = 0.091
Δσ_N = 0.046
Δσ_N/σ_N2 = 0.509
(166) 2012-12-01 16:53
CA= 0% Qo=1 Bo=11.1
<V_MC>=335 τ=14.0
σ_N2 = 0.113
Δσ_N =-0.032
Δσ_N/σ_N2 =-0.285
(167) 2012-12-02 07:30
CA=23% Qo=1 Bo=11.5
<V_MC>=325 τ=36.0
σ_N2 = 0.195
Δσ_N = 0.052
Δσ_N/σ_N2 = 0.265
(168) 2013-01-17 16:12
CA=19% Qo=2 Bo=14.4
<V_MC>=391 τ=19.5
σ_N2 = 0.158
Δσ_N = 0.081
Δσ_N/σ_N2 = 0.516
(169) 2013-03-17 17:06
CA=13% Qo=2 Bo=13.3
<V_MC>=606 τ= 6.7
σ_N2 = 0.081
Δσ_N = 0.117
Δσ_N/σ_N2 = 1.434
(170) 2013-03-18 02:24
CA=75% Qo=3 Bo=15.2
<V_MC>=513 τ=23.5
σ_N2 = 0.089
Δσ_N =-0.023
Δσ_N/σ_N2 =-0.260
(171) 2013-04-14 18:17
CA=33% Qo=2 Bo=11.3
<V_MC>=410 τ=26.0
σ_N2 = 0.151
Δσ_N = 0.082
Δσ_N/σ_N2 = 0.546
(172) 2013-04-30 13:48
CA=32% Qo=3 Bo=11.9
<V_MC>=389 τ=16.0
σ_N2 = 0.114
Δσ_N = 0.055
Δσ_N/σ_N2 = 0.479
(173) 2013-05-14 08:48
CA=78% Qo=1 Bo=13.3
<V_MC>=350 τ=18.0
σ_N2 = 0.050
Δσ_N = 0.010
Δσ_N/σ_N2 = 0.208
(174) 2013-05-16 02:47
CA=12% Qo=3 Bo= 7.4
<V_MC>=393 τ=11.5
σ_N2 = 0.133
Δσ_N = 0.068
Δσ_N/σ_N2 = 0.511
(175) 2013-06-06 15:48
CA=41% Qo=2 Bo=15.0
<V_MC>=423 τ=28.5
σ_N2 = 0.091
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.856
(176) 2013-06-28 12:18
CA=48% Qo=2 Bo=14.7
<V_MC>=388 τ=23.5
σ_N2 = 0.111
Δσ_N = 0.020
Δσ_N/σ_N2 = 0.181
(177) 2013-07-05 23:17
CA=26% Qo=1 Bo=12.1
<V_MC>=321 τ=41.5
σ_N2 = 0.143
Δσ_N = 0.083
Δσ_N/σ_N2 = 0.585
(178) 2013-07-10 12:06
CA=75% Qo=2 Bo=15.0
<V_MC>=443 τ=16.8
σ_N2 = 0.071
Δσ_N = 0.053
Δσ_N/σ_N2 = 0.752
(179) 2013-07-13 06:18
CA=13% Qo=3 Bo=13.4
<V_MC>=399 τ=49.0
σ_N2 = 0.184
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.425
(180) 2013-10-02 21:17
CA=31% Qo=3 Bo= 9.4
<V_MC>=474 τ=21.5
σ_N2 = 0.091
Δσ_N = 0.015
Δσ_N/σ_N2 = 0.164
B/B_o
% duration

Figure B.10

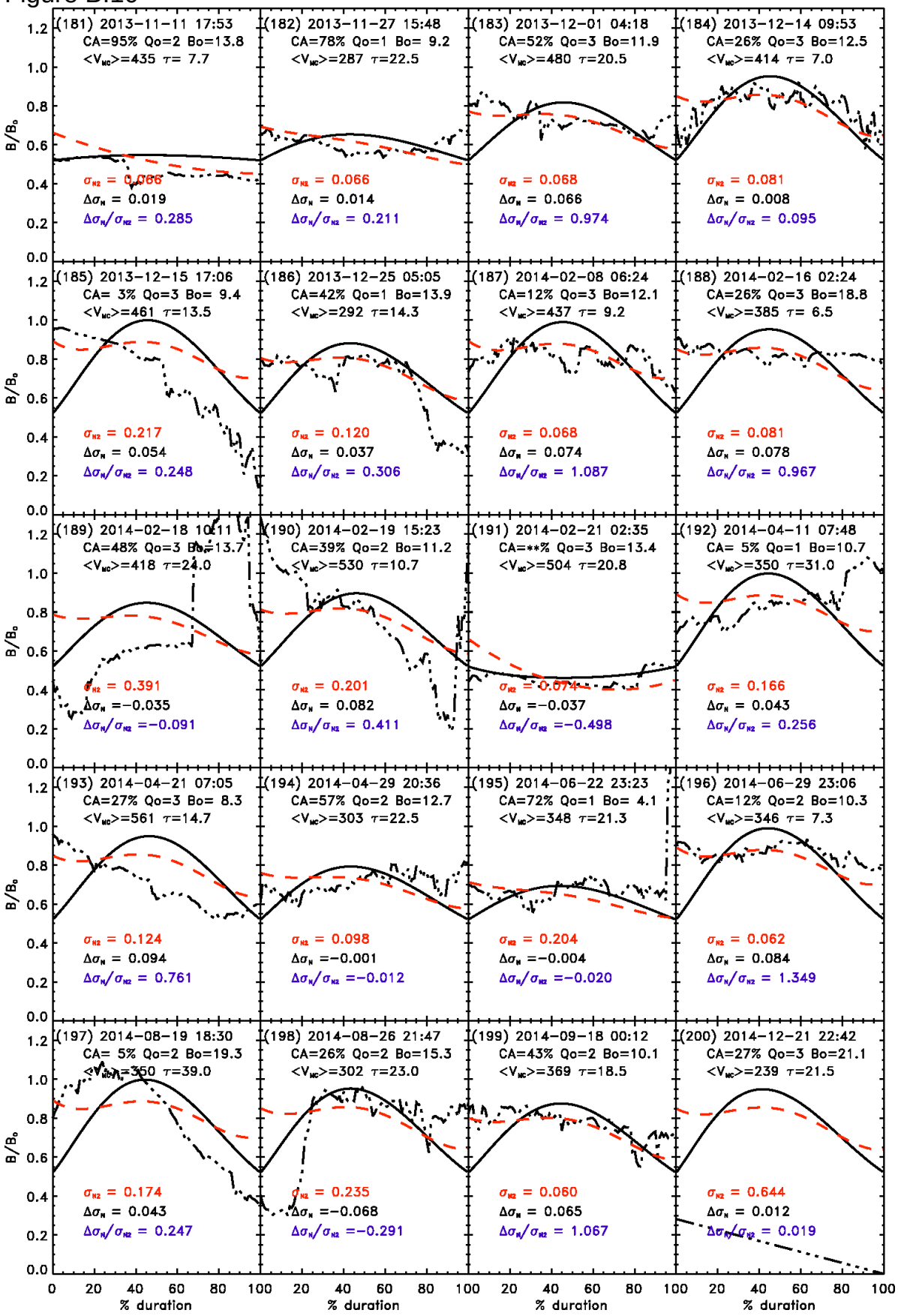
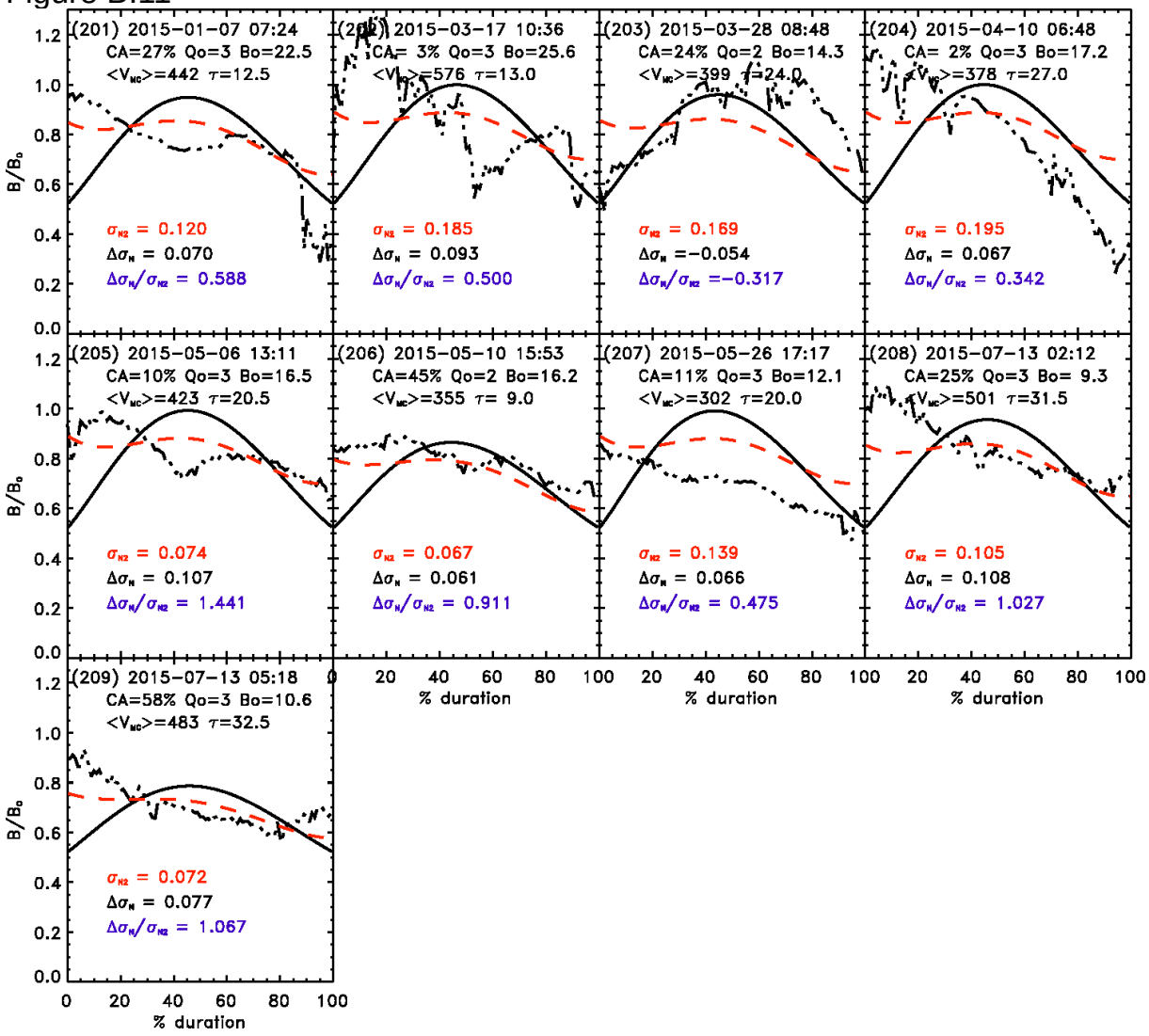

(181) 2013-11-11 17:53
CA=95% Qo=2 Bo=13.8
<V_MC>=435 τ= 7.7
σ_N2 = 0.066
Δσ_N = 0.019
Δσ_N/σ_N2 = 0.285
(182) 2013-11-27 15:48
CA=78% Qo=1 Bo= 9.2
<V_MC>=287 τ=22.5
σ_N2 = 0.066
Δσ_N = 0.014
Δσ_N/σ_N2 = 0.211
(183) 2013-12-01 04:18
CA=52% Qo=3 Bo=11.9
<V_MC>=480 τ=20.5
σ_N2 = 0.068
Δσ_N = 0.066
Δσ_N/σ_N2 = 0.974
(184) 2013-12-14 09:53
CA=26% Qo=3 Bo=12.5
<V_MC>=414 τ= 7.0
σ_N2 = 0.081
Δσ_N = 0.008
Δσ_N/σ_N2 = 0.095
(185) 2013-12-15 17:06
CA= 3% Qo=3 Bo= 9.4
<V_MC>=461 τ=13.5
σ_N2 = 0.217
Δσ_N = 0.054
Δσ_N/σ_N2 = 0.248
(186) 2013-12-25 05:05
CA=42% Qo=1 Bo=13.9
<V_MC>=292 τ=14.3
σ_N2 = 0.120
Δσ_N = 0.037
Δσ_N/σ_N2 = 0.306
(187) 2014-02-08 06:24
CA=12% Qo=3 Bo=12.1
<V_MC>=437 τ= 9.2
σ_N2 = 0.068
Δσ_N = 0.074
Δσ_N/σ_N2 = 1.087
(188) 2014-02-16 02:24
CA=26% Qo=3 Bo=18.8
<V_MC>=385 τ= 6.5
σ_N2 = 0.081
Δσ_N = 0.078
Δσ_N/σ_N2 = 0.967
(189) 2014-02-18 10:11
CA=48% Qo=3 Bo=13.7
<V_MC>=418 τ=24.0
σ_N2 = 0.391
Δσ_N =-0.035
Δσ_N/σ_N2 =-0.091
(190) 2014-02-19 15:23
CA=39% Qo=2 Bo=11.2
<V_MC>=530 τ=10.7
σ_N2 = 0.201
Δσ_N = 0.082
Δσ_N/σ_N2 = 0.411
(191) 2014-02-21 02:35
CA=**% Qo=3 Bo=13.4
<V_MC>=504 τ=20.8
σ_N2 = 0.074
Δσ_N =-0.037
Δσ_N/σ_N2 =-0.498
(192) 2014-04-11 07:48
CA= 5% Qo=1 Bo=10.7
<V_MC>=350 τ=31.0
σ_N2 = 0.166
Δσ_N = 0.043
Δσ_N/σ_N2 = 0.256
(193) 2014-04-21 07:05
CA=27% Qo=3 Bo= 8.3
<V_MC>=561 τ=14.7
σ_N2 = 0.124
Δσ_N = 0.094
Δσ_N/σ_N2 = 0.761
(194) 2014-04-29 20:36
CA=57% Qo=2 Bo=12.7
<V_MC>=303 τ=22.5
σ_N2 = 0.098
Δσ_N =-0.001
Δσ_N/σ_N2 =-0.012
(195) 2014-06-22 23:23
CA=72% Qo=1 Bo= 4.1
<V_MC>=348 τ=21.3
σ_N2 = 0.204
Δσ_N =-0.004
Δσ_N/σ_N2 =-0.020
(196) 2014-06-29 23:06
CA=12% Qo=2 Bo=10.3
<V_MC>=346 τ= 7.3
σ_N2 = 0.062
Δσ_N = 0.084
Δσ_N/σ_N2 = 1.349
(197) 2014-08-19 18:30
CA= 5% Qo=2 Bo=19.3
<V_MC>=350 τ=39.0
σ_N2 = 0.174
Δσ_N = 0.043
Δσ_N/σ_N2 = 0.247
(198) 2014-08-26 21:47
CA=26% Qo=2 Bo=15.3
<V_MC>=302 τ=23.0
σ_N2 = 0.235
Δσ_N =-0.068
Δσ_N/σ_N2 =-0.291
(199) 2014-09-18 00:12
CA=43% Qo=2 Bo=10.1
<V_MC>=369 τ=18.5
σ_N2 = 0.060
Δσ_N = 0.065
Δσ_N/σ_N2 = 1.067
(200) 2014-12-21 22:42
CA=27% Qo=3 Bo=21.1
<V_MC>=239 τ=21.5
σ_N2 = 0.644
Δσ_N = 0.012
Δσ_N/σ_N2 = 0.019
B/B_o
% duration

Figure B.11


(201) 2015-01-07 07:24
CA=27% Qo=3 Bo=22.5
<V_MC>=442 τ=12.5
σ_N2 = 0.120
Δσ_N = 0.070
Δσ_N/σ_N2 = 0.588
(202) 2015-03-17 10:36
CA= 3% Qo=3 Bo=25.6
<V_MC>=576 τ=13.0
σ_N2 = 0.185
Δσ_N = 0.093
Δσ_N/σ_N2 = 0.500
(203) 2015-03-28 08:48
CA=24% Qo=2 Bo=14.3
<V_MC>=399 τ=24.0
σ_N2 = 0.169
Δσ_N =-0.054
Δσ_N/σ_N2 =-0.317
(204) 2015-04-10 06:48
CA= 2% Qo=3 Bo=17.2
<V_MC>=378 τ=27.0
σ_N2 = 0.195
Δσ_N = 0.067
Δσ_N/σ_N2 = 0.342
(205) 2015-05-06 13:11
CA=10% Qo=3 Bo=16.5
<V_MC>=423 τ=20.5
σ_N2 = 0.074
Δσ_N = 0.107
Δσ_N/σ_N2 = 1.441
(206) 2015-05-10 15:53
CA=45% Qo=2 Bo=16.2
<V_MC>=355 τ= 9.0
σ_N2 = 0.067
Δσ_N = 0.061
Δσ_N/σ_N2 = 0.911
(207) 2015-05-26 17:17
CA=11% Qo=3 Bo=12.1
<V_MC>=302 τ=20.0
σ_N2 = 0.139
Δσ_N = 0.066
Δσ_N/σ_N2 = 0.475
(208) 2015-07-13 02:12
CA=25% Qo=3 Bo= 9.3
<V_MC>=501 τ=31.5
σ_N2 = 0.105
Δσ_N = 0.108
Δσ_N/σ_N2 = 1.027
(209) 2015-07-13 05:18
CA=58% Qo=3 Bo=10.6
<V_MC>=483 τ=32.5
σ_N2 = 0.072
Δσ_N = 0.077
Δσ_N/σ_N2 = 1.067
B/B_o
% duration