CMX Drift Velocities

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Natasa Miladinovic
Brandeis University

Used CMU/CMX J/Ψ candidates to measure the CMX drift velocities. Varying the drift velocity varies the Z coordinate of the stubs. The correct drift velocity will center the DZ distribution at 0.0.

Used data from 20 August to 15 December 2002.

Used secondary datasets jbot0h, jbotch, jbotdh, jpmm08 which were reconstructed with release 4.8.3. Reran muon reconstruction with release 4.9.1hpt1 using the simple extrapolator.

Has a CMU stub
$1.5 < p_T < 10.0$ GeV/c
EM < 3.0 GeV
HAD < 6.0 GeV
EM + HAD > 0.1

Table 1: Selection requirements for CMU muon.

Has a CMX stub
$3.0 < p_T < 10.0$ GeV/c
CMX Fiducial Distance < 40.0 cm
EM < 3.0 GeV
HAD < 6.0 GeV
EM + HAD > 0.1

Table 2: Selection requirements for CMX muon.

Opposite Charge
Difference in track z0 < 5 cm
The VertexFit converges
Mass between 2.6 GeV and 3.6 GeV

Table 3: Selection requirements on the J/Ψ candidates.

Side	East	West
v_d [μm/ns]	42.529 ± 0.006	43.042 ± 0.006
Mean DZ [cm]	0.00±0.07	0.00± 0.07

Table 4: Drift velocities for the East and West side. For comparison, values calculated in September study were 42.580 for East and 43.149 for West. Mean DZ for East was (0.62±0.07)cm, and for West (-1.29±0.07)cm.

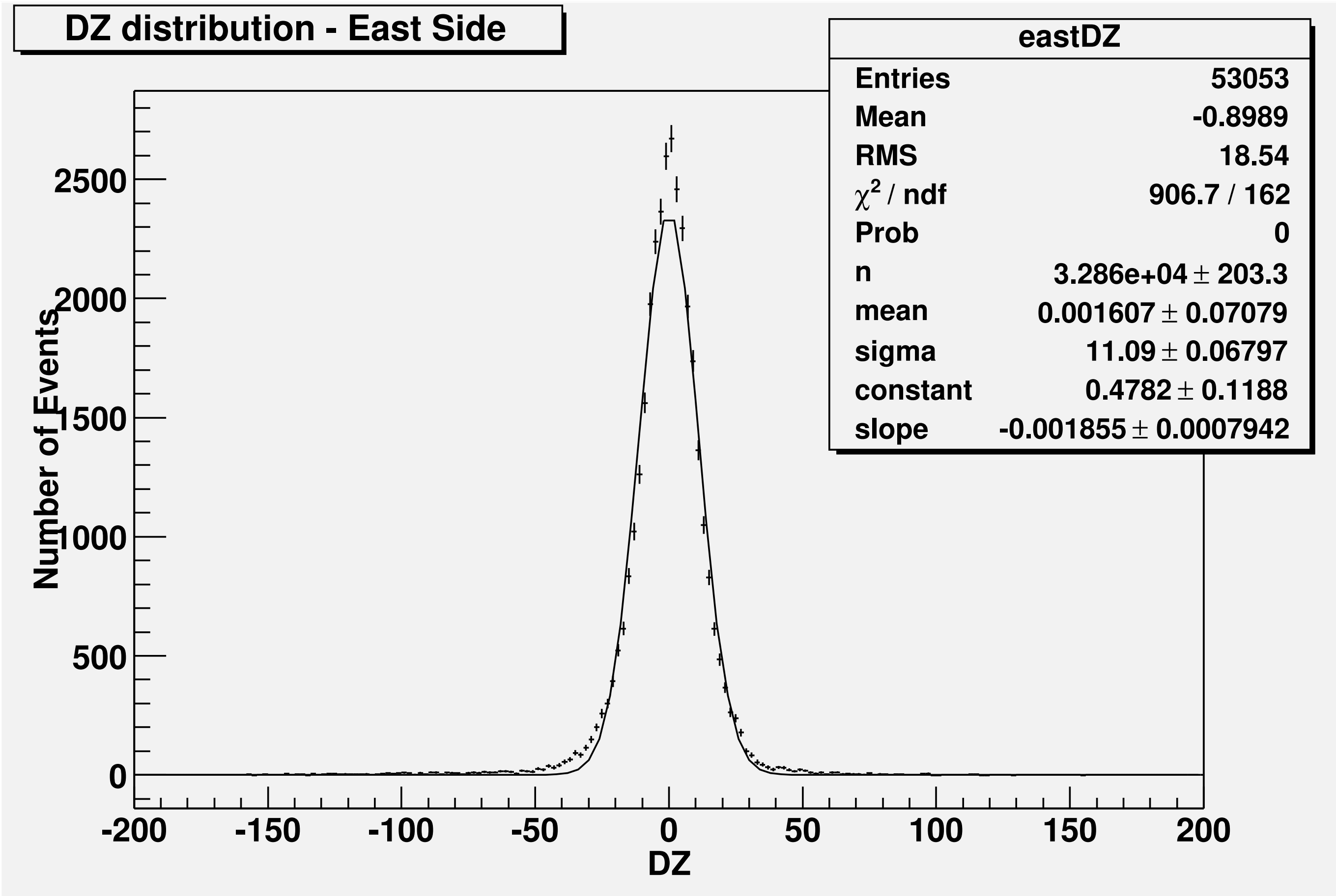
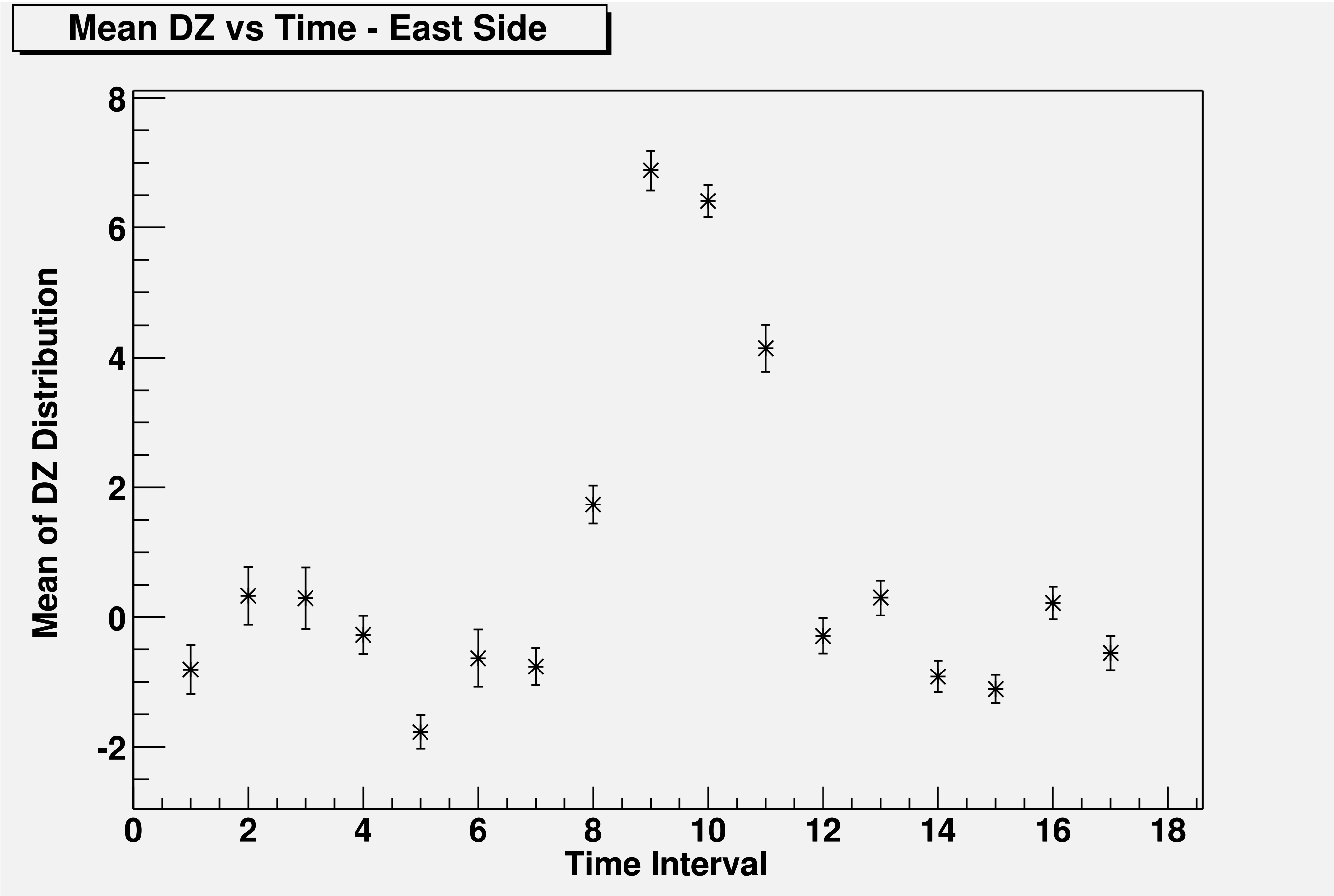
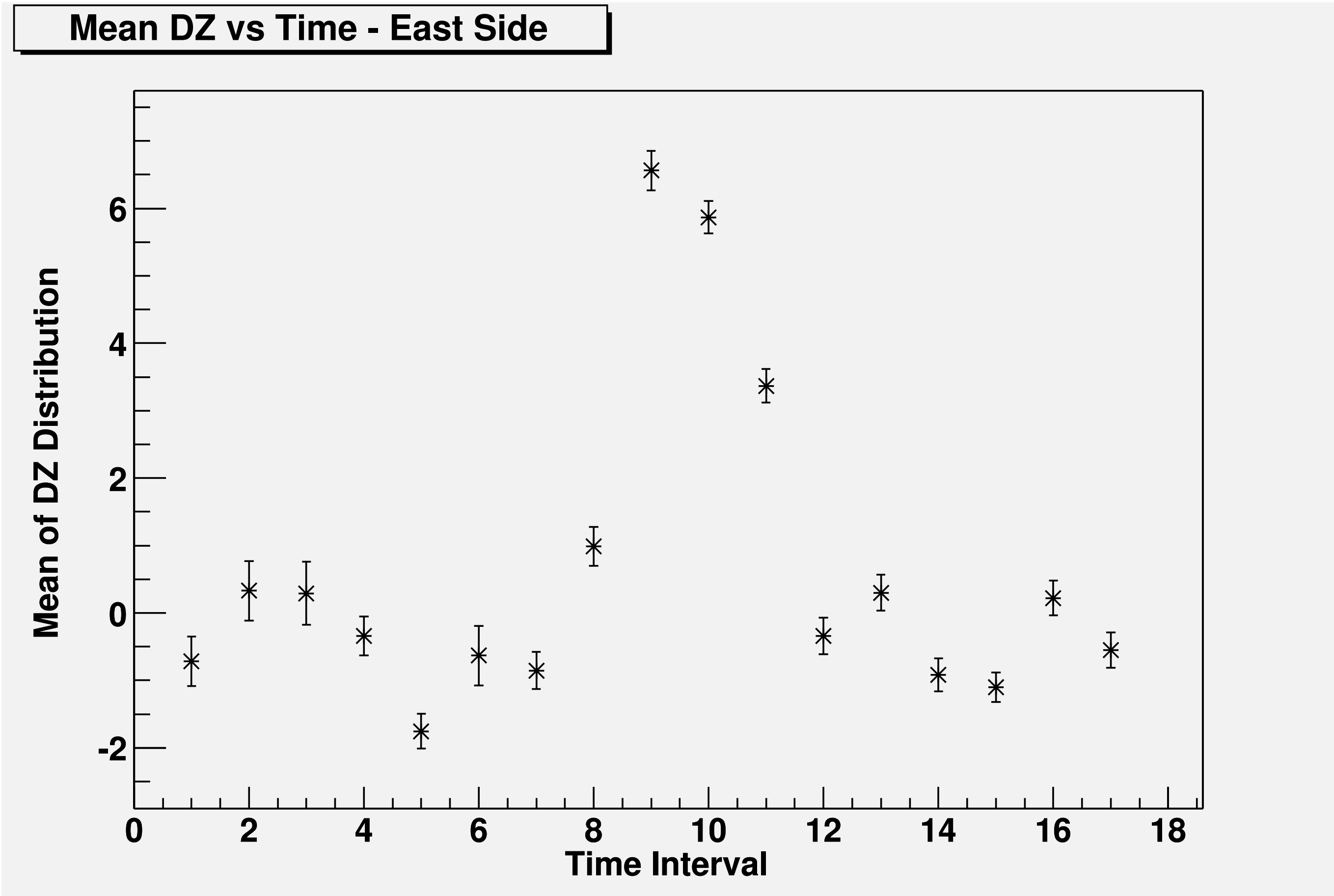


Figure 1: East side DZ distribution. The value in each bin has been sideband subtracted so that it reflects the J/Ψ signal in each bin. A drift velocity of 42.529 μm/ns was used to reconstruct the CMX stubs. A gaussian plus a line are fitted to the distribution. Parameter n is the number of J/Ψ's in the gaussian peak. Parameter mean is the mean of the gaussian. Parameter sigma is the width of the gaussian.



1	Aug20-Aug26	150145-150444	10	Oct22-Oct28	153265-153416
2	Aug27-Sep2	150798-150885	11	Oct29-Nov4	153419-153739
3	Sep3 -Sep9	150886-151236	12	Nov5 -Nov11	153945-154069
4	Sep10-Sep16	151237-151641	13	Nov12-Nov18	154070-154211
5	Sep17-Sep23	151683-151922	14	Nov19-Nov25	154449-154613
6	Sep24-Sep30	151968-152267	15	Nov26-Dec2	154653-154860
7	Oct1 -Oct7	152270-152600	16	Dec3 -Dec9	154861-155155
8	Oct8 -Oct14	152601-152811	17	Dec10-Dec15	155297-155392
9	Oct15-Oct21	152942-153091			



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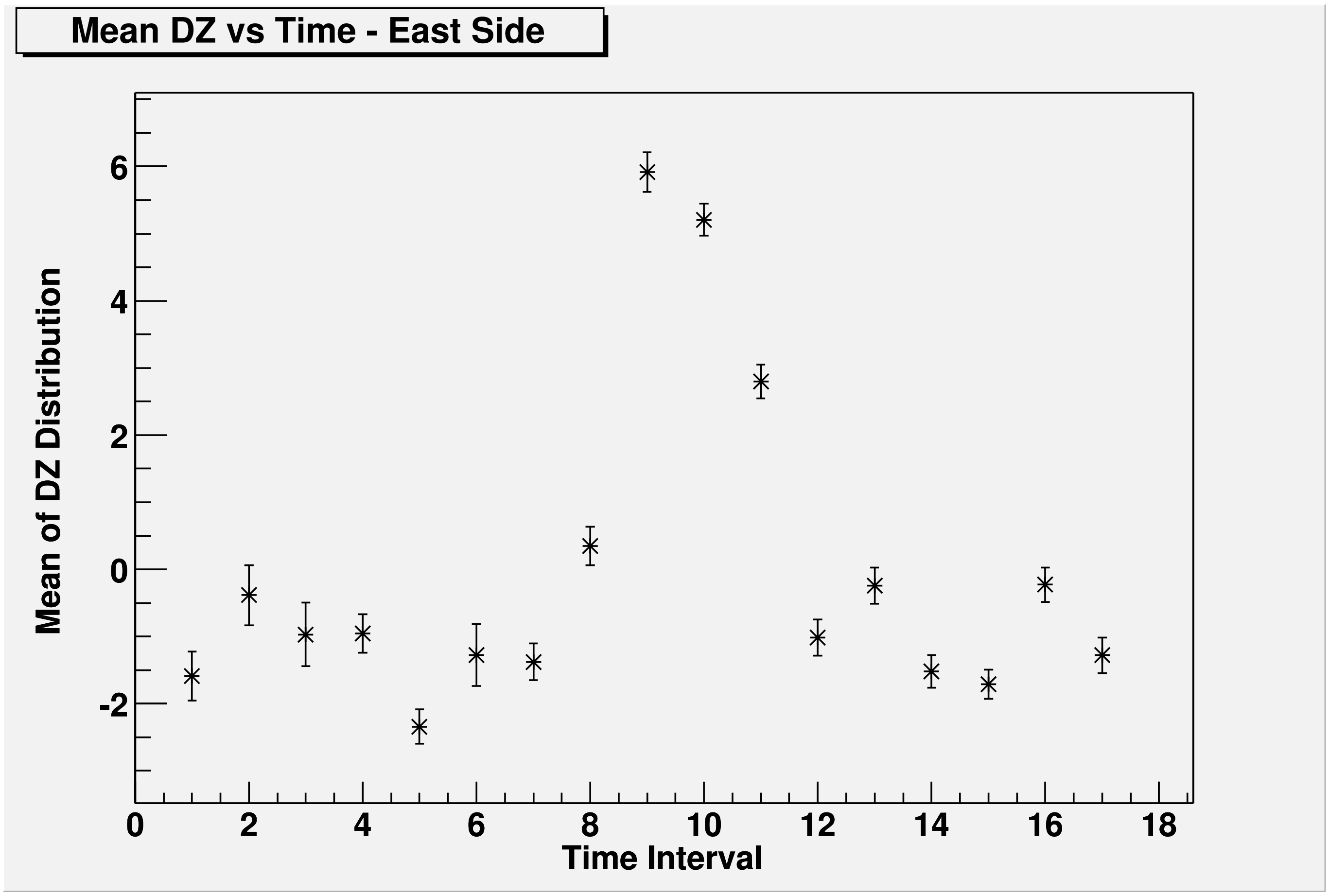

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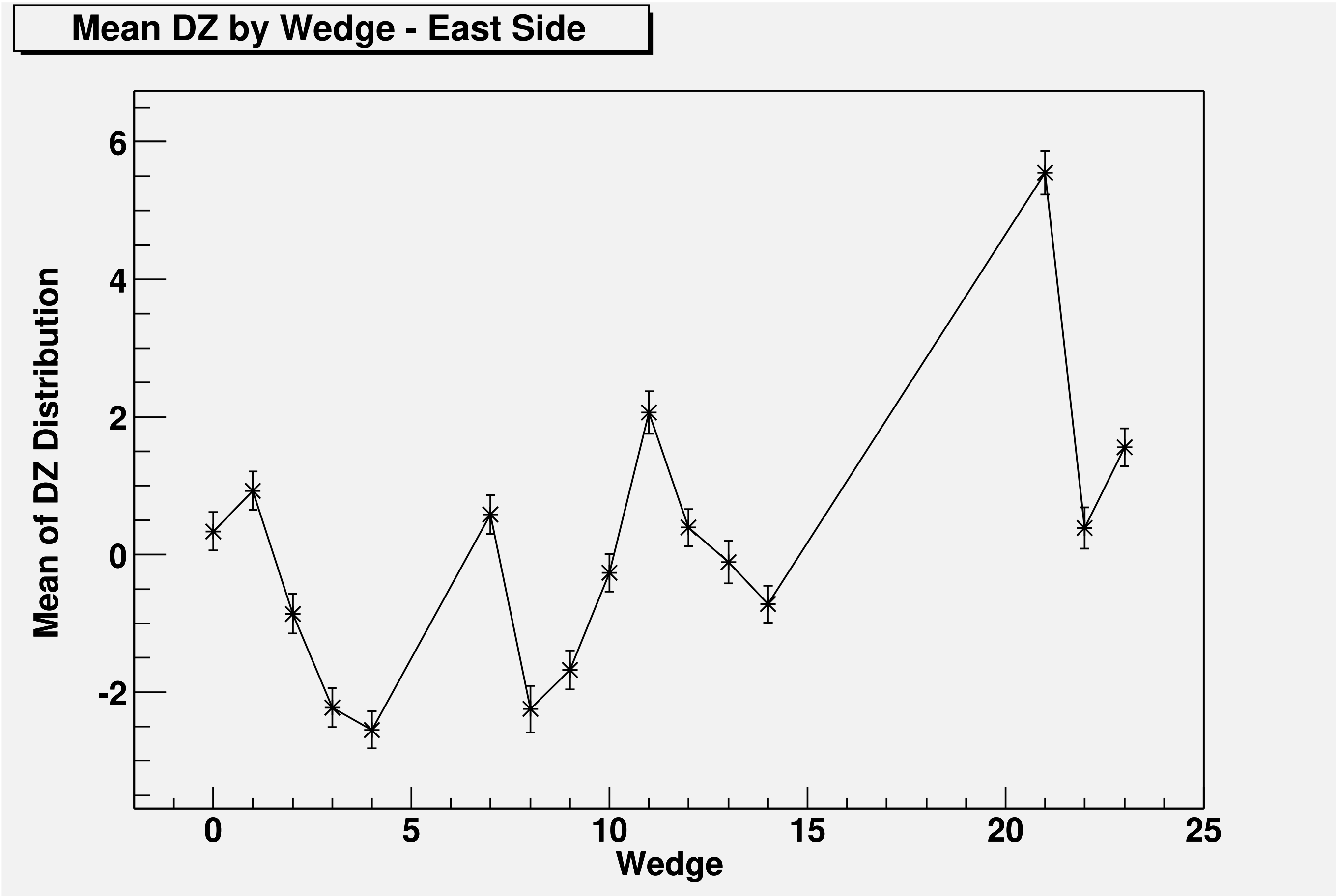

Figure 2: DZ means by wedge, East side.

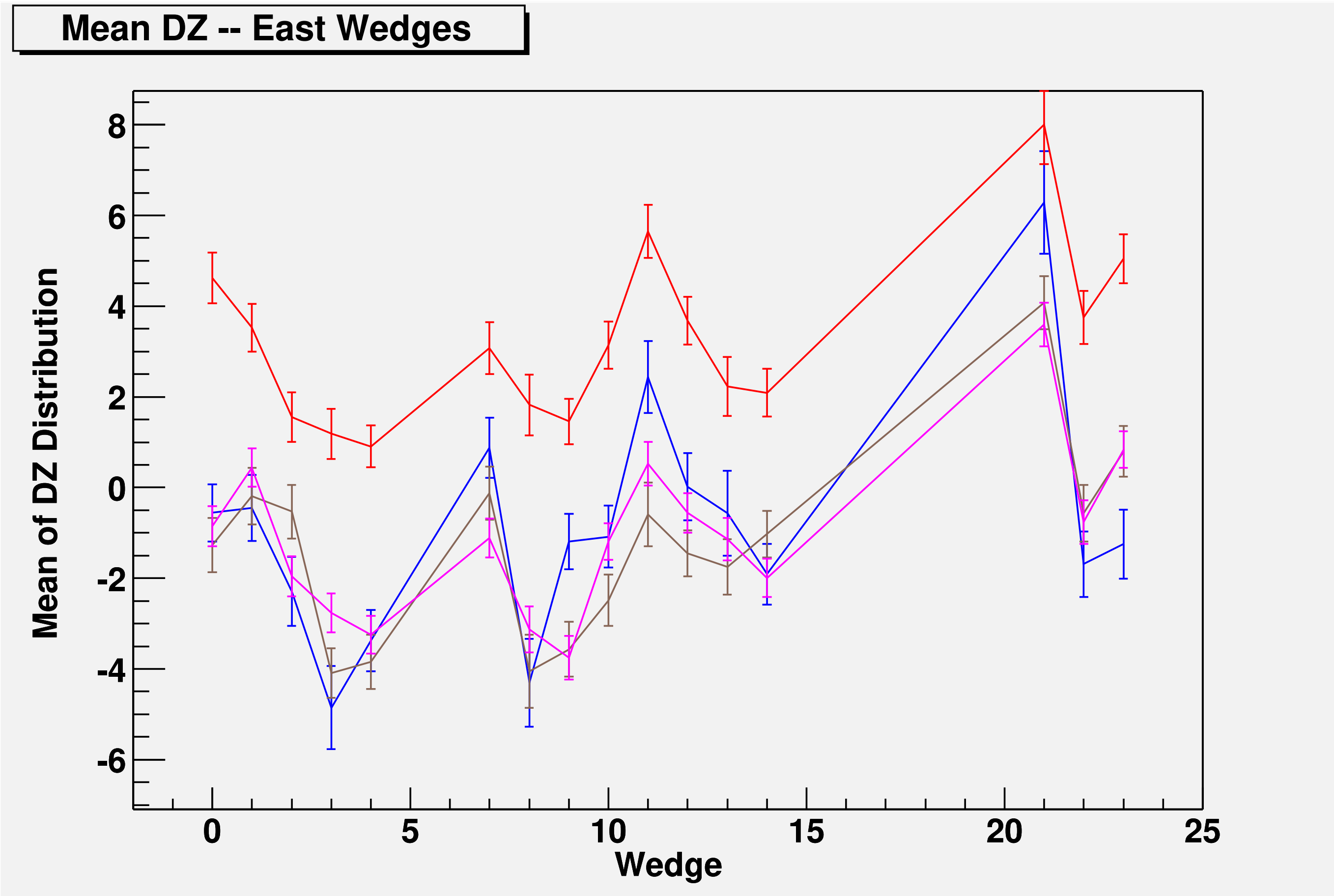

Figure 3: DZ means for East wedges, divided in 4 time intervals.

blue	Aug20-Sept16	150145-151641	brown	Sept17-Oct14	151683-152811
red	Oct15-Nov11	152942-154069	pink	Nov12-Dec15	154070-155392

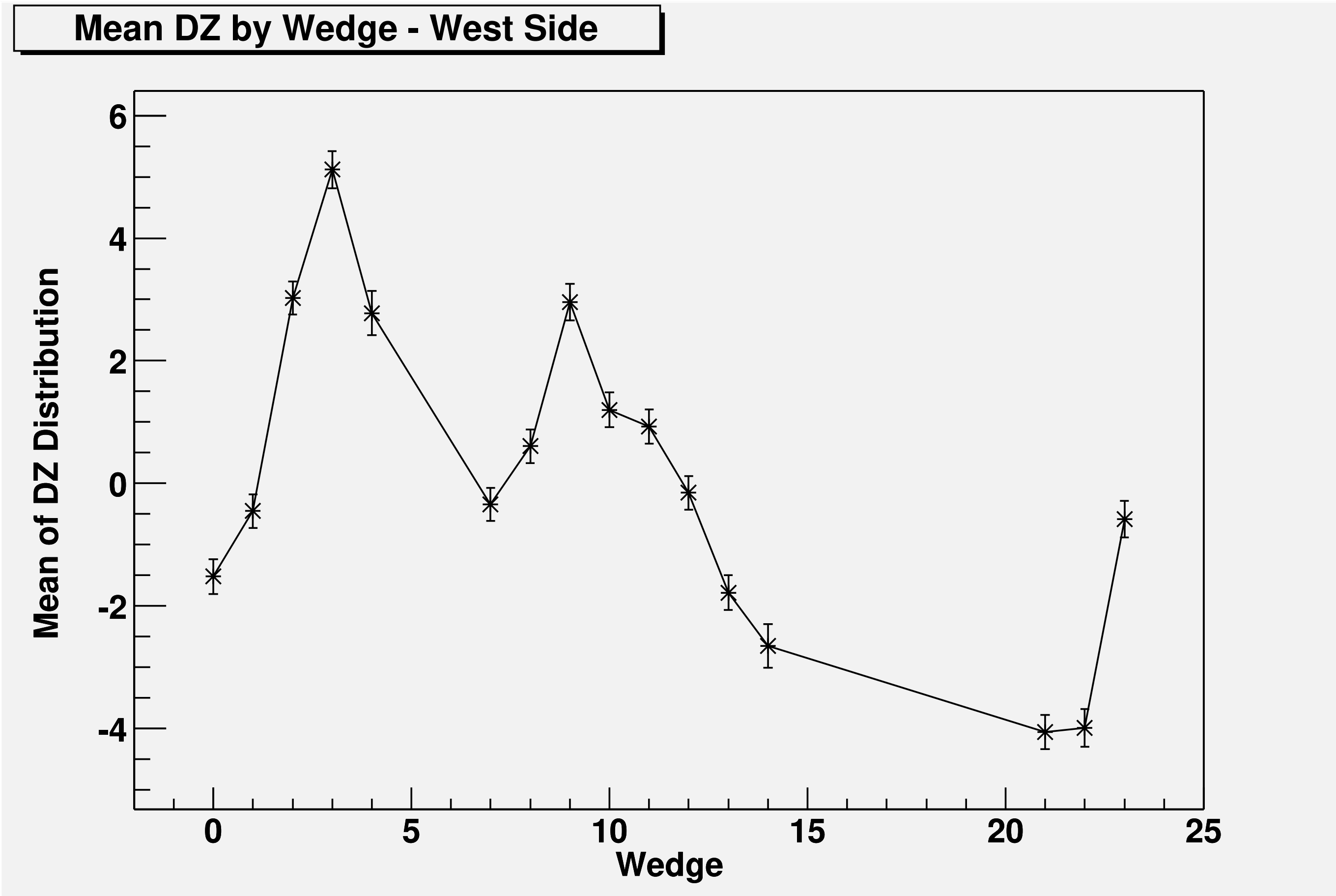

Figure 4: DZ means by wedge, West side.

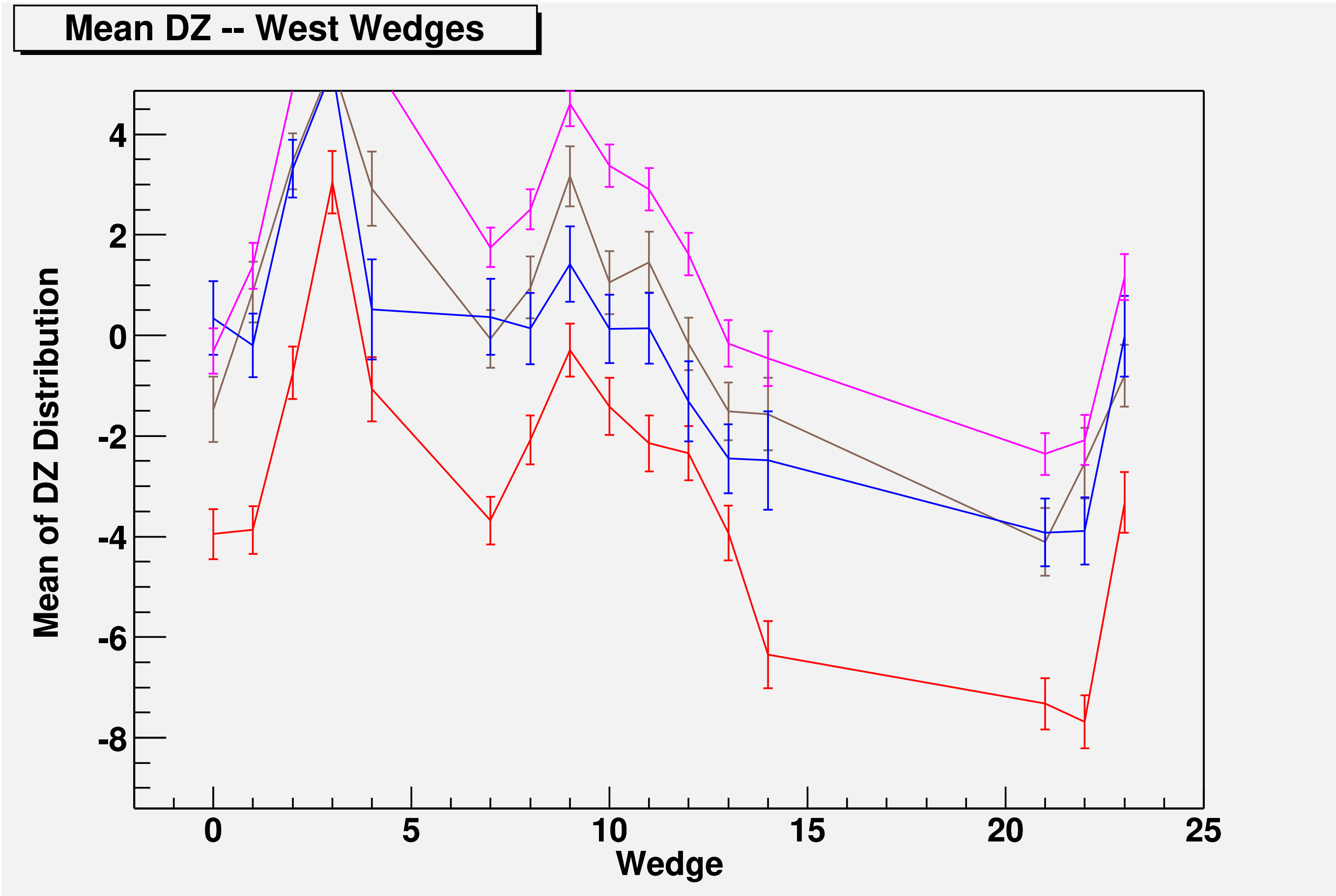

Figure 5: DZ means for West wedges, divided in 4 time intervals.

blue	Aug20-Sept16	150145-151641	brown	Sept17-Oct14	151683-152811
red	Oct15-Nov11	152942-154069	pink	Nov12-Dec15	154070-155392

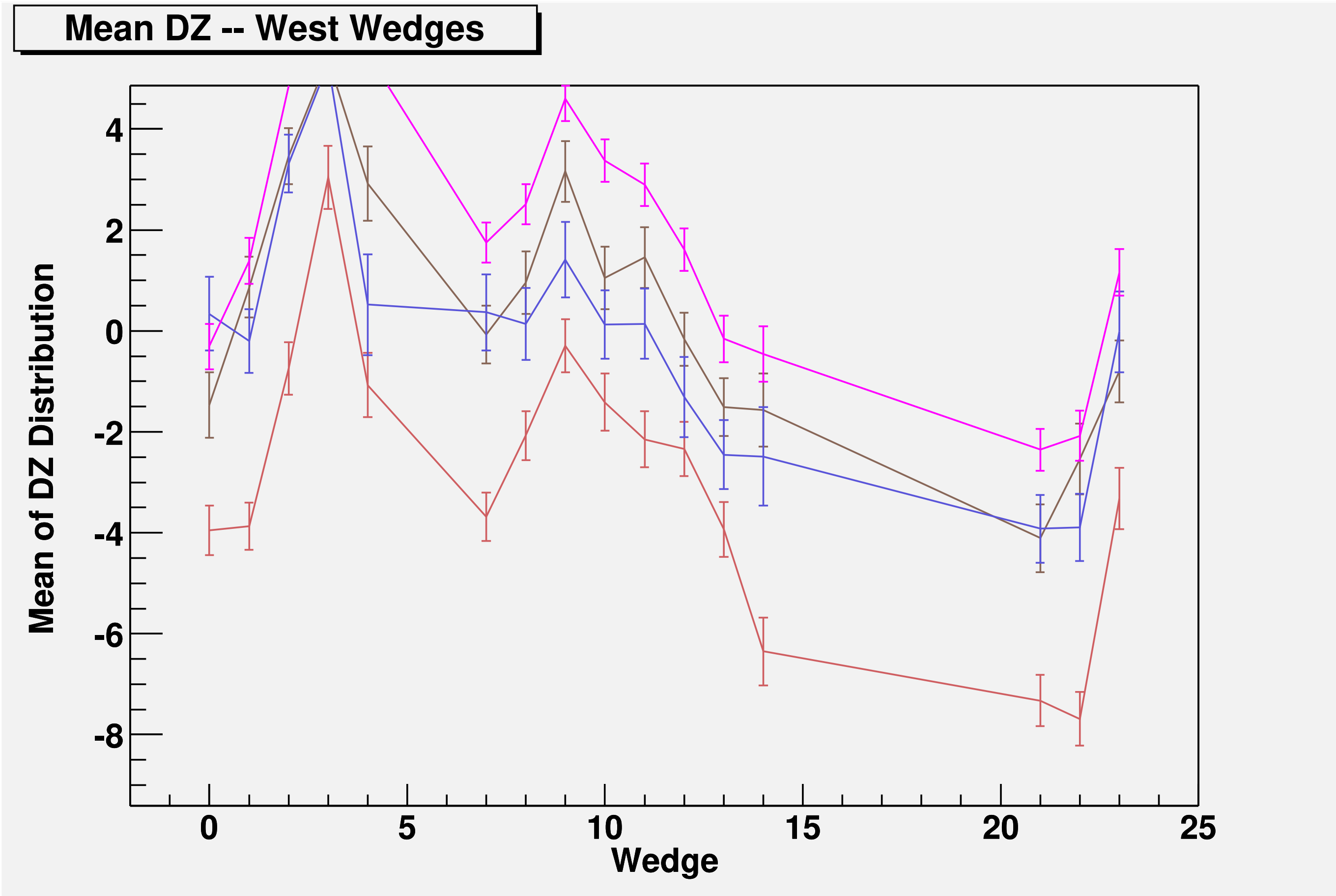

Figure 6: DZ means for West wedges, divided in 4 time intervals.

blue	Aug20-Sept16	150145-151641	brown	Sept17-Oct14	151683-152811
red	Oct15-Nov11	152942-154069	pink	Nov12-Dec15	154070-155392

Conclusion

- **Calculate wedge-by-wedge correction and put in the database. Recalculate east and west drift velocities weekly.**
- **Better solutions?**