

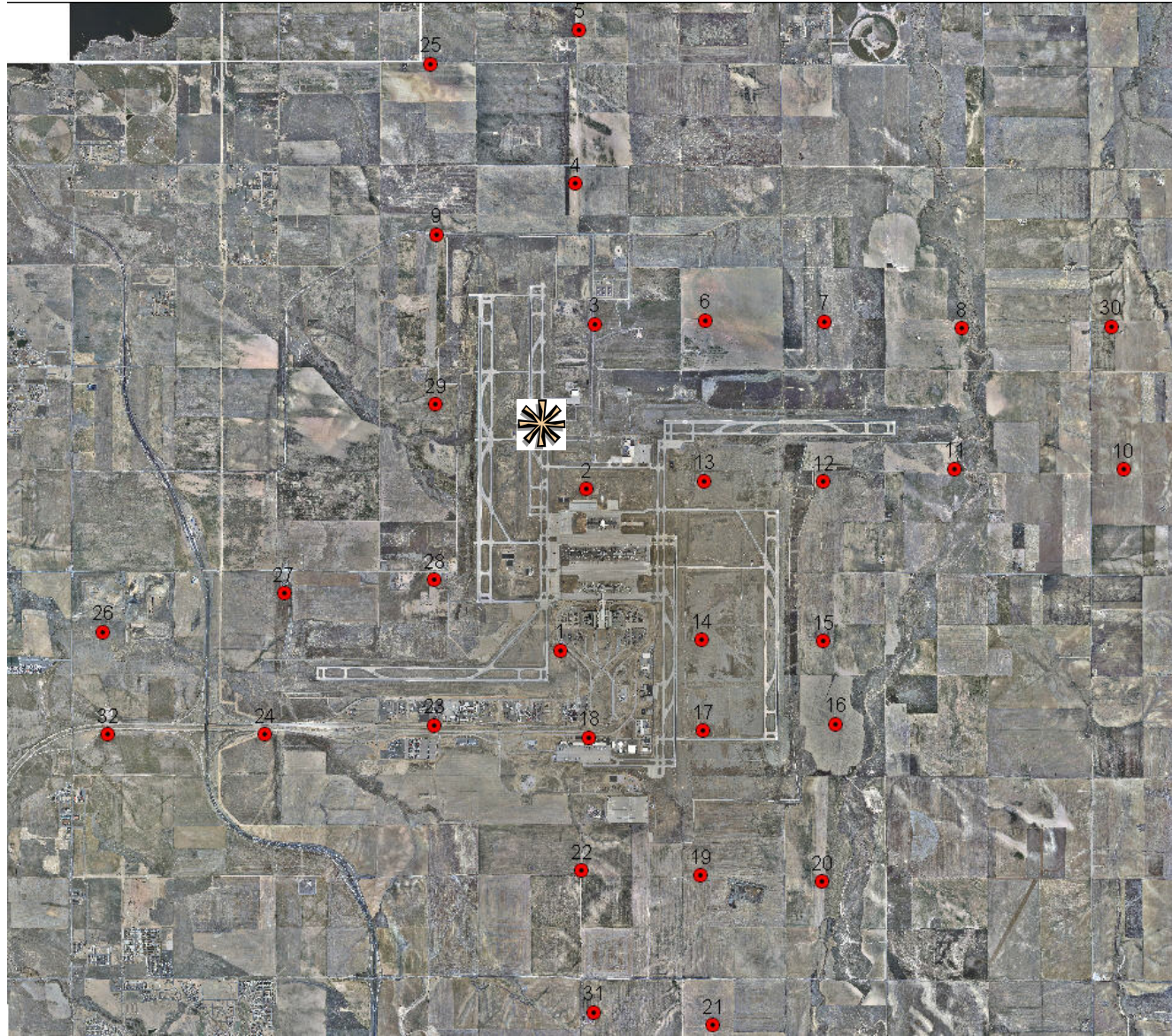
COA1404

LLWAS Wind Analysis

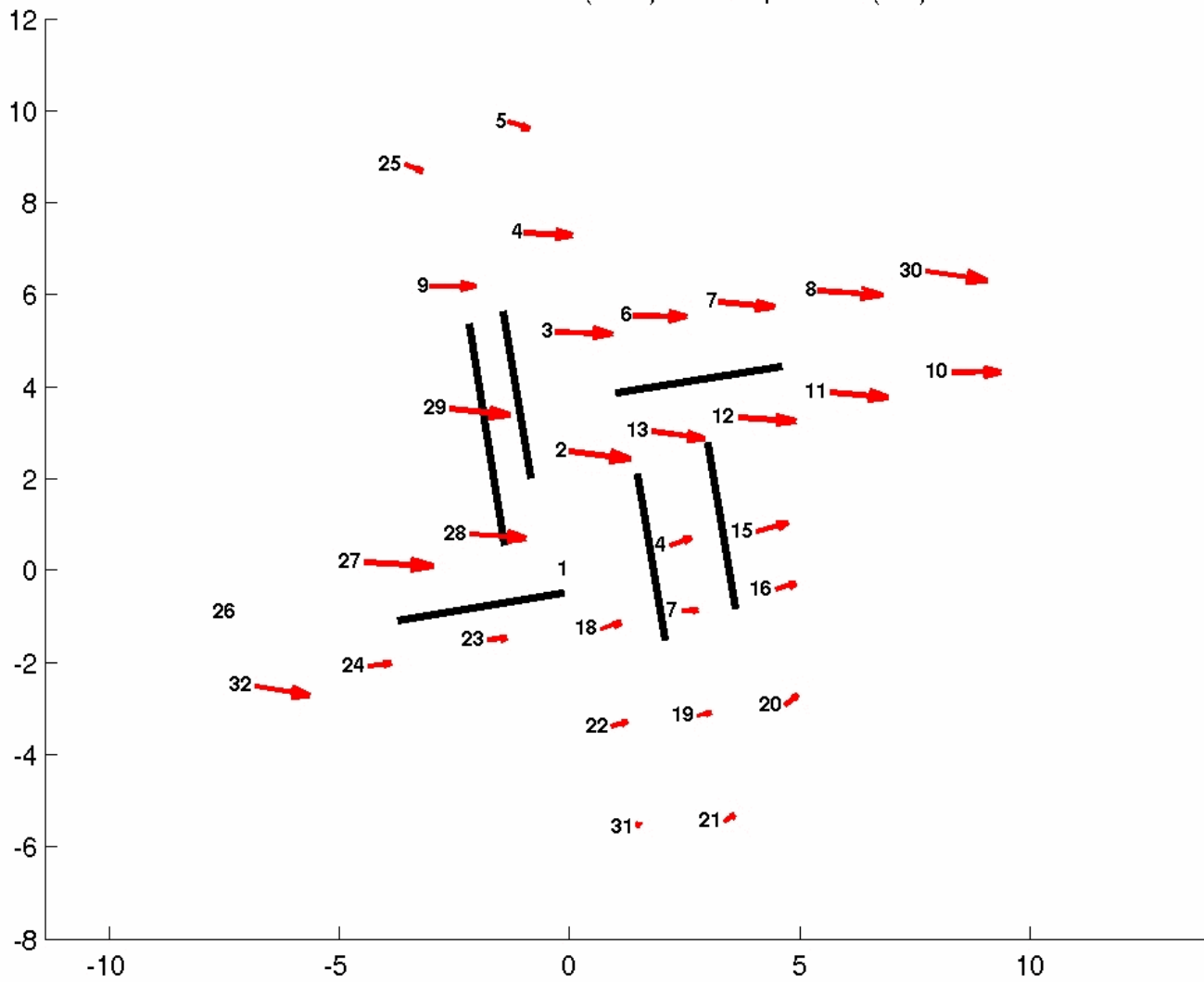
Larry B. Cornman

National Center
for
Atmospheric Research

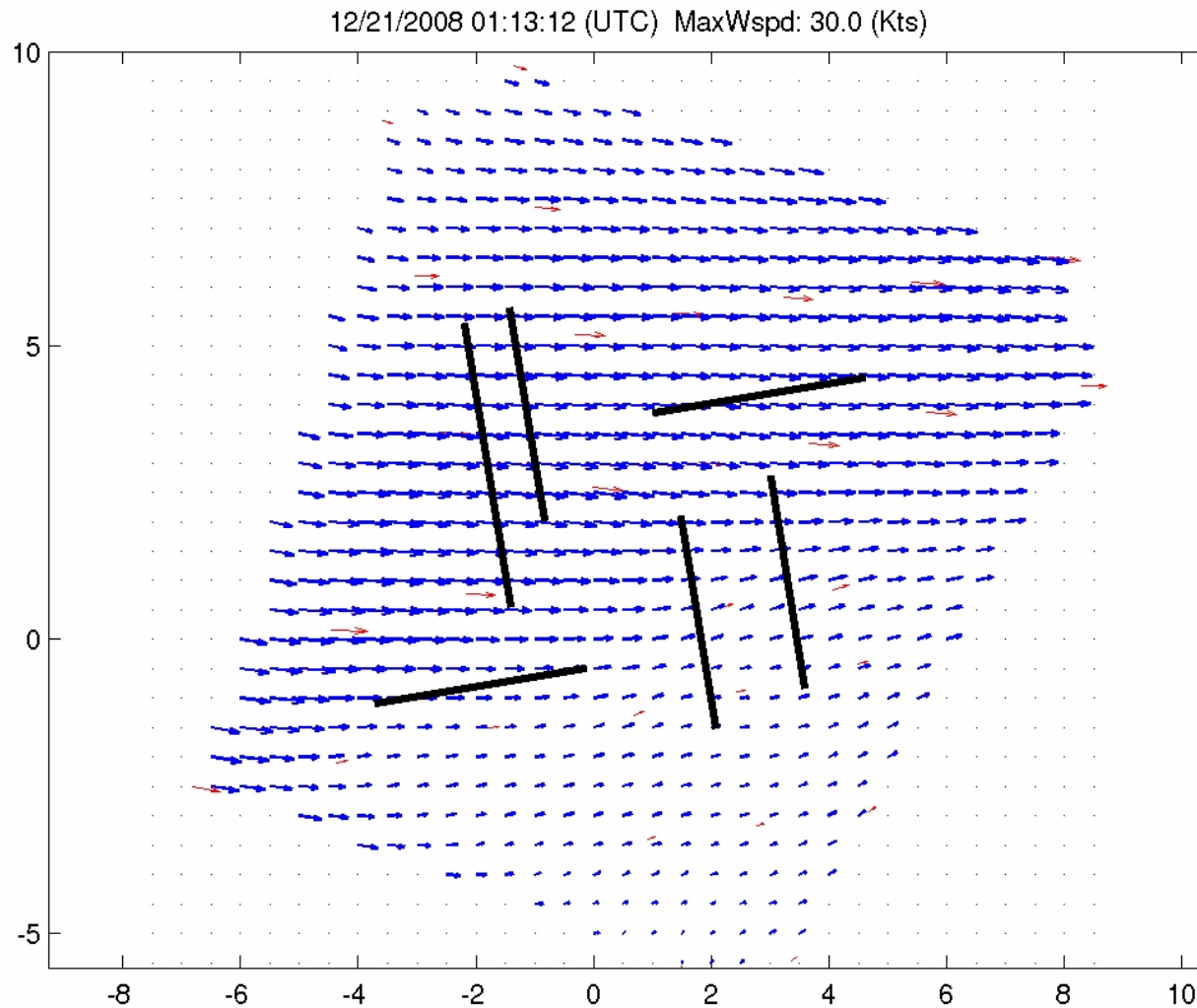
DIA Runways and LLWAS Stations



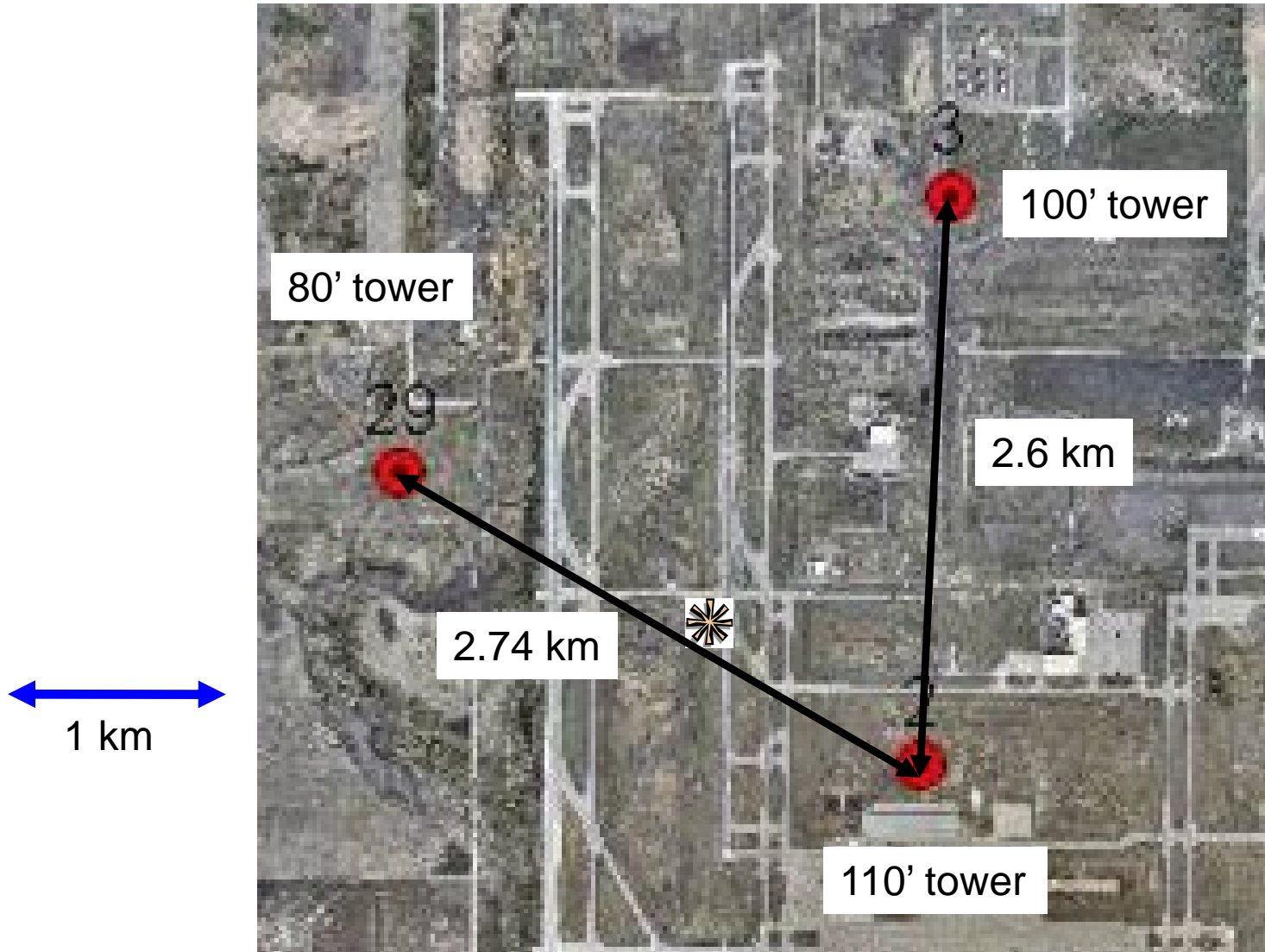
12/21/2008 01:13:12 (UTC) MaxWspd: 30.0 (Kts)



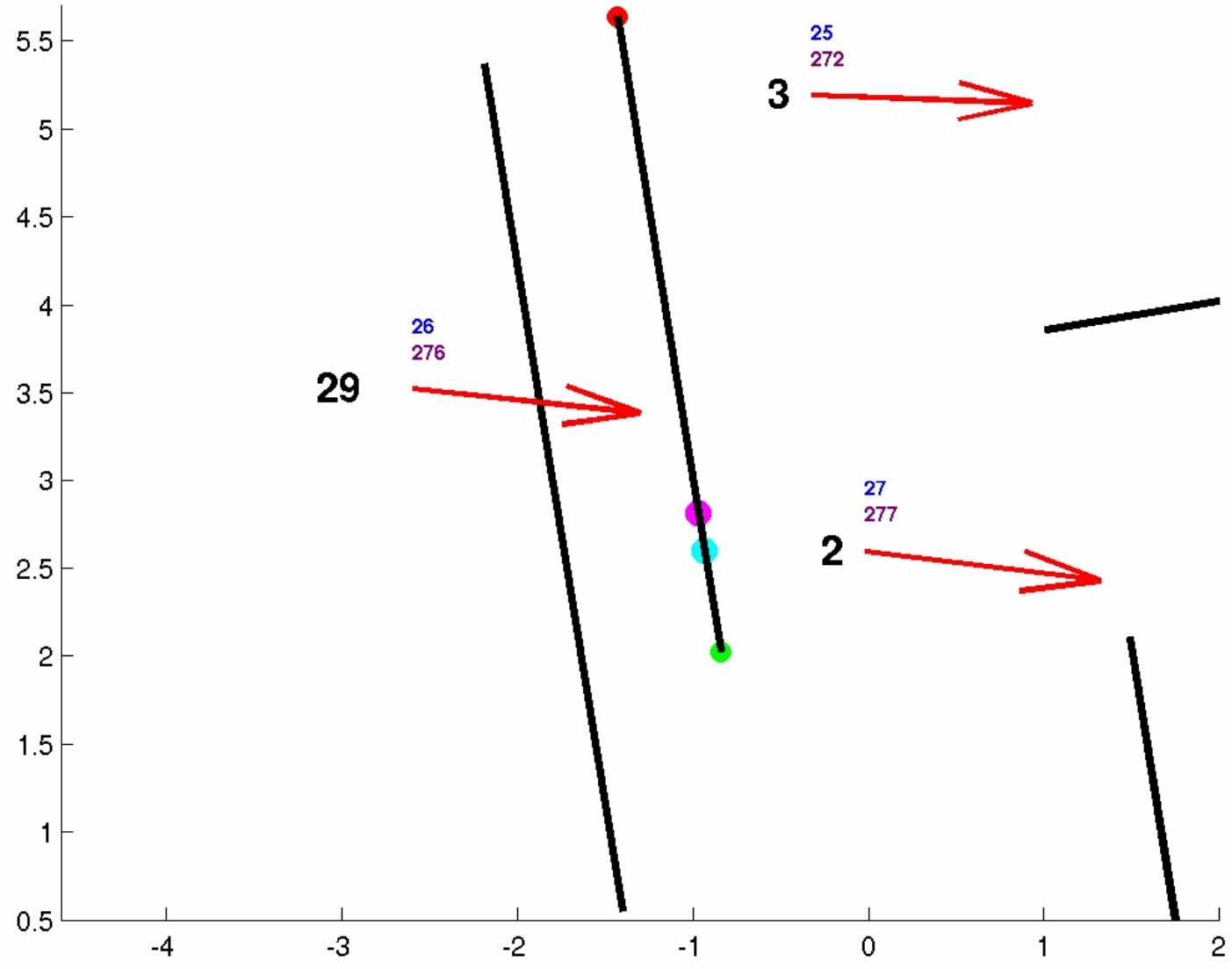
Interpolated Wind Field



Blow-up: DIA Runways and LLWAS Stations

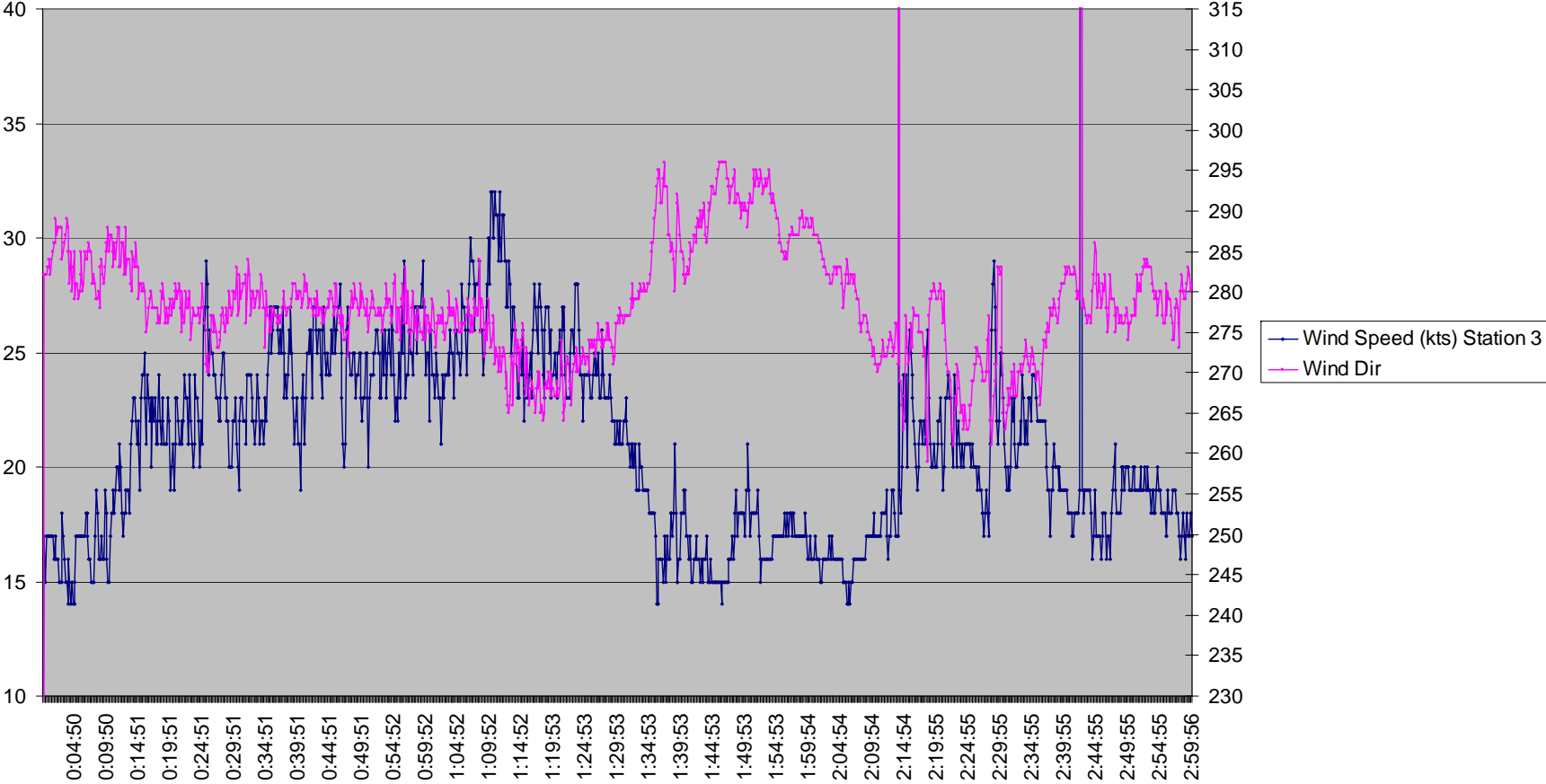


12/21/2008 01:13:12 (UTC) MaxWspd: 27.0 (Kts)

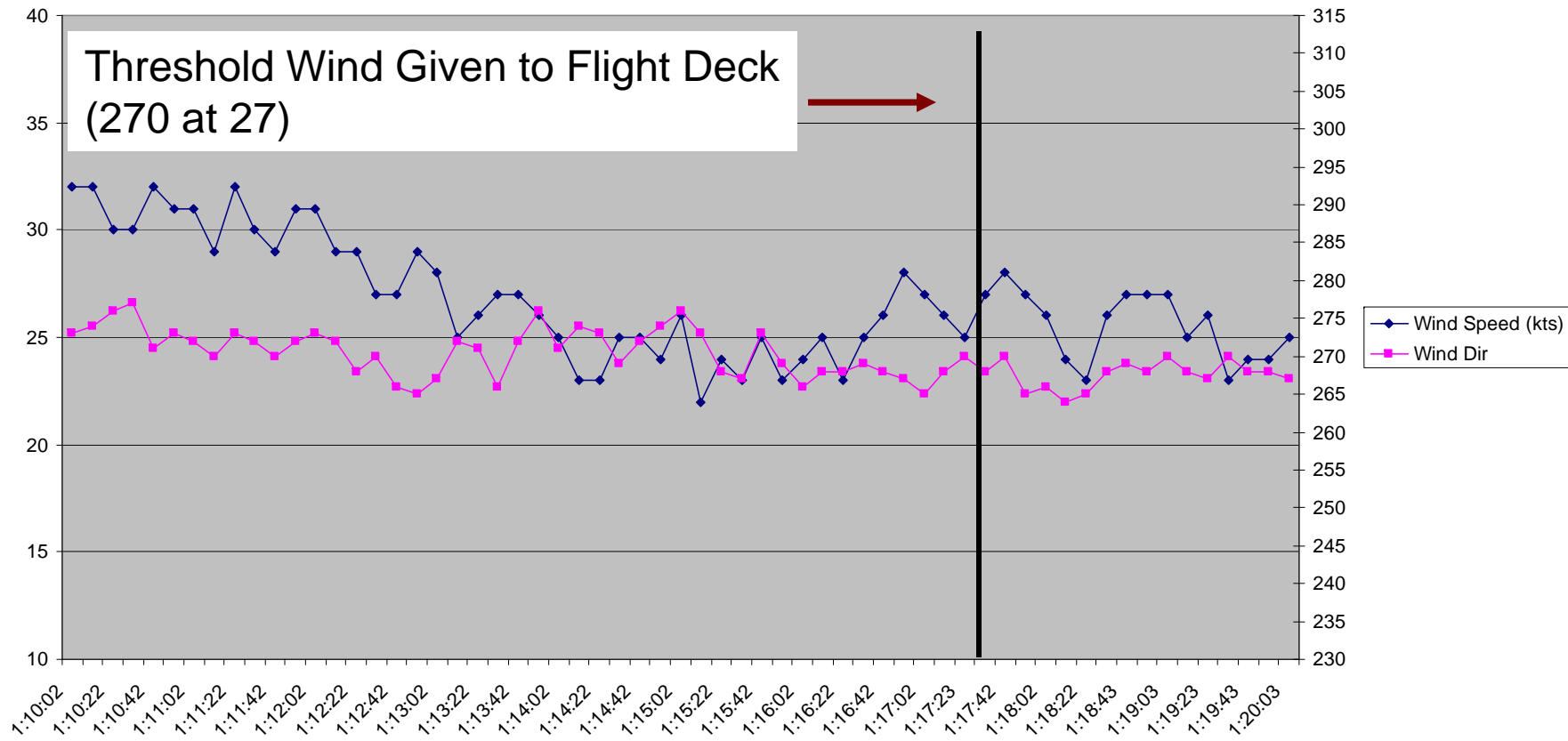


Station 3: Threshold Sensor for 34RD

Wind Speed (kts) and Direction
Station 3

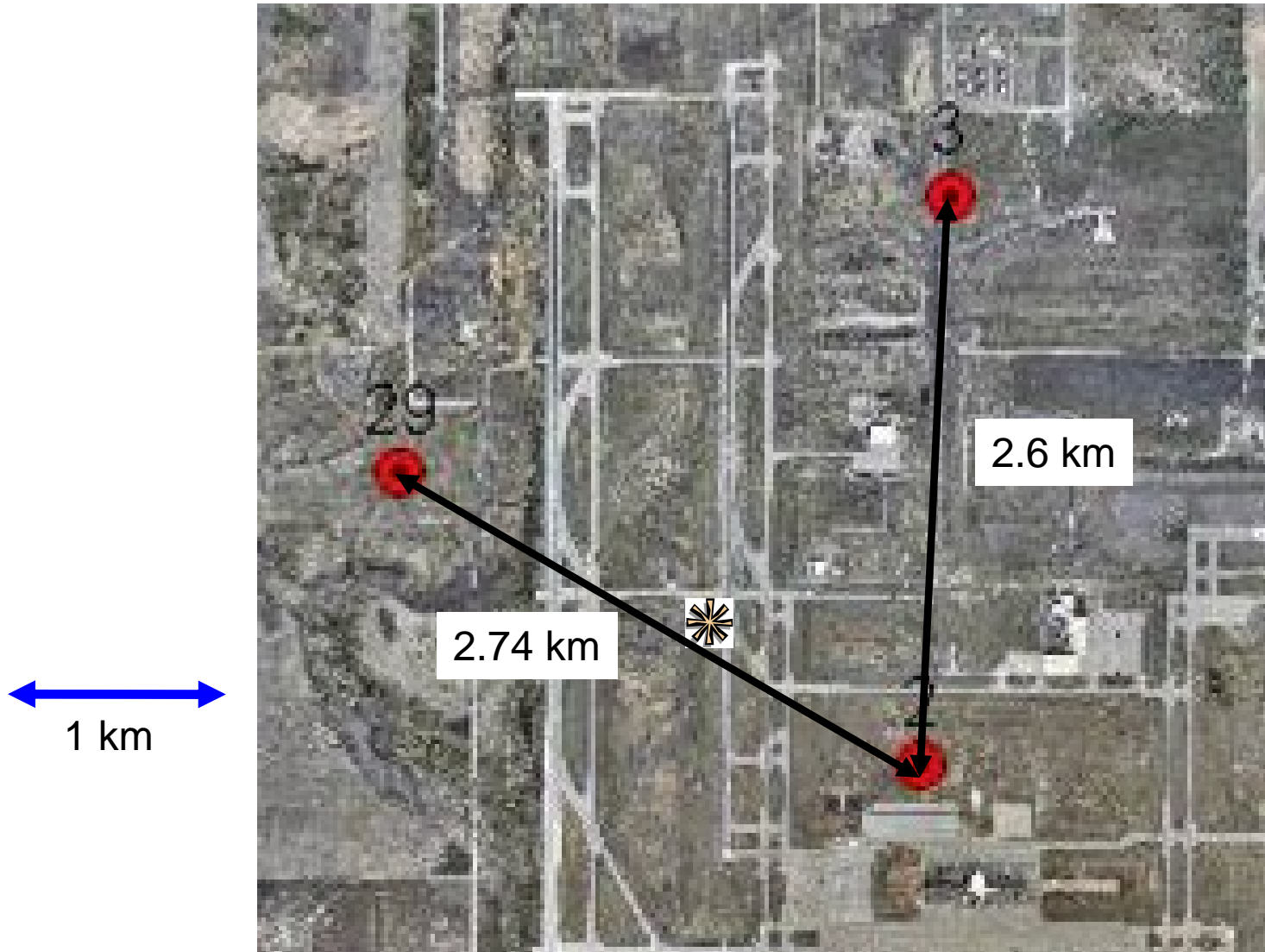


Wind Speed (kts) and Direction
Station 3

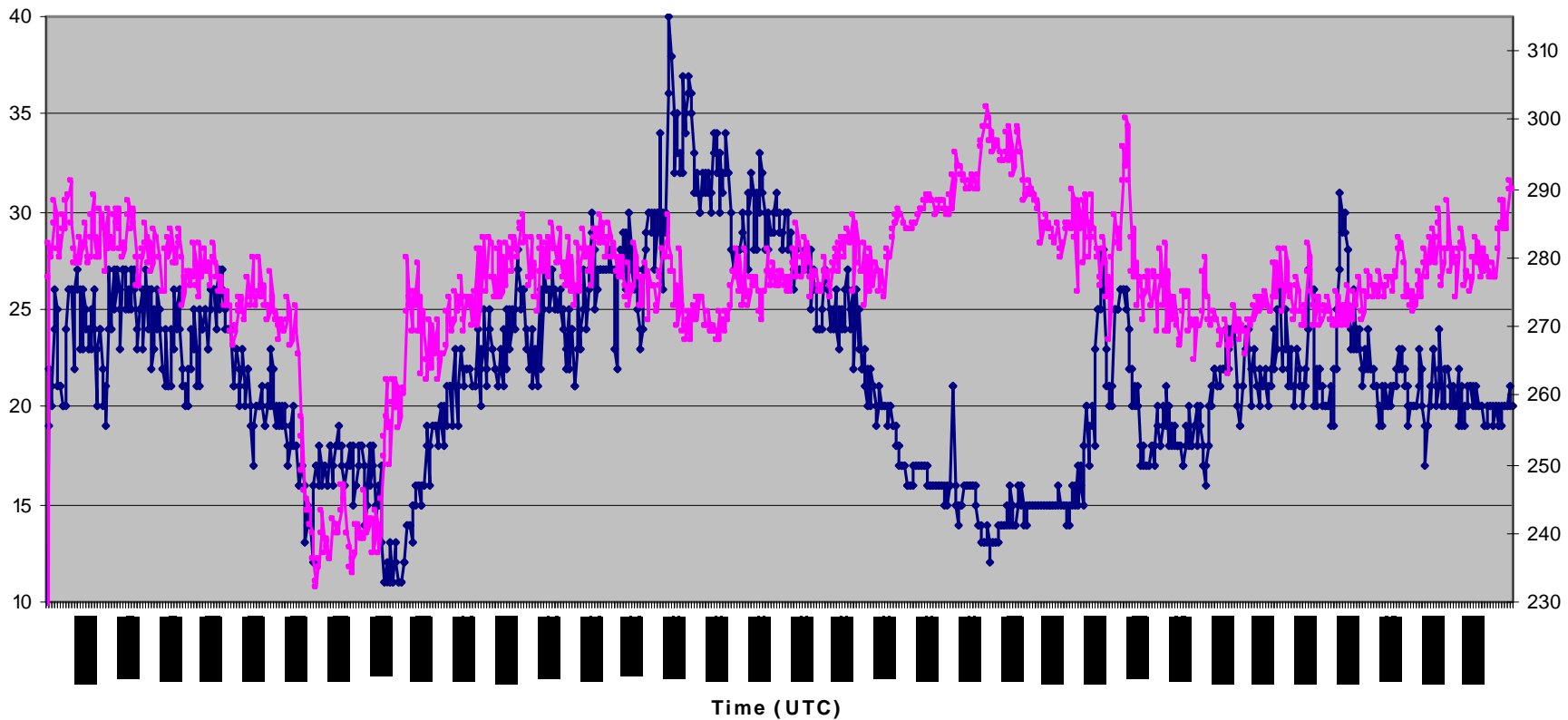


Time Window: 1:10:02 – 1:20:03 UTC (by 20 sec)

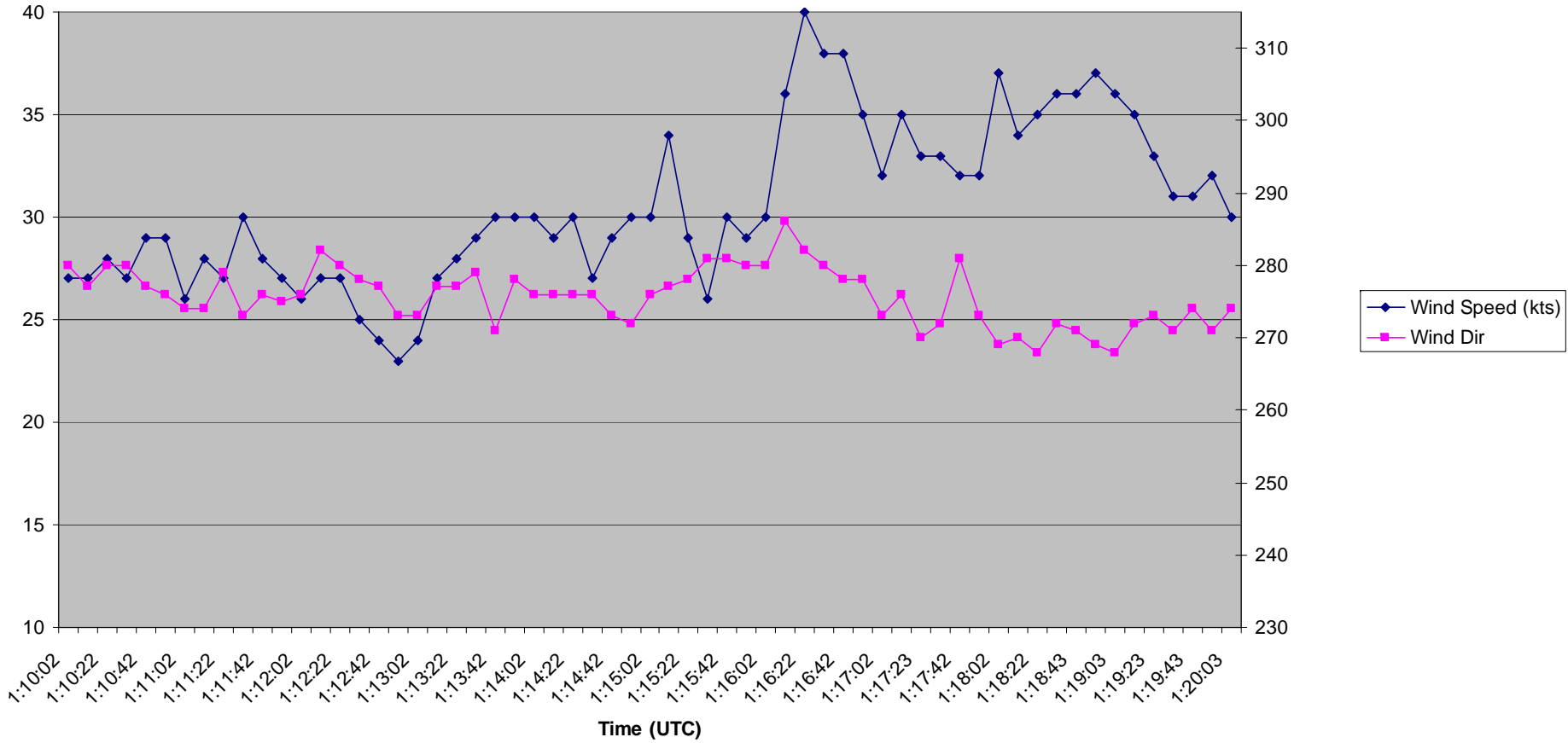
Blow-up: DIA Runways and LLWAS Stations



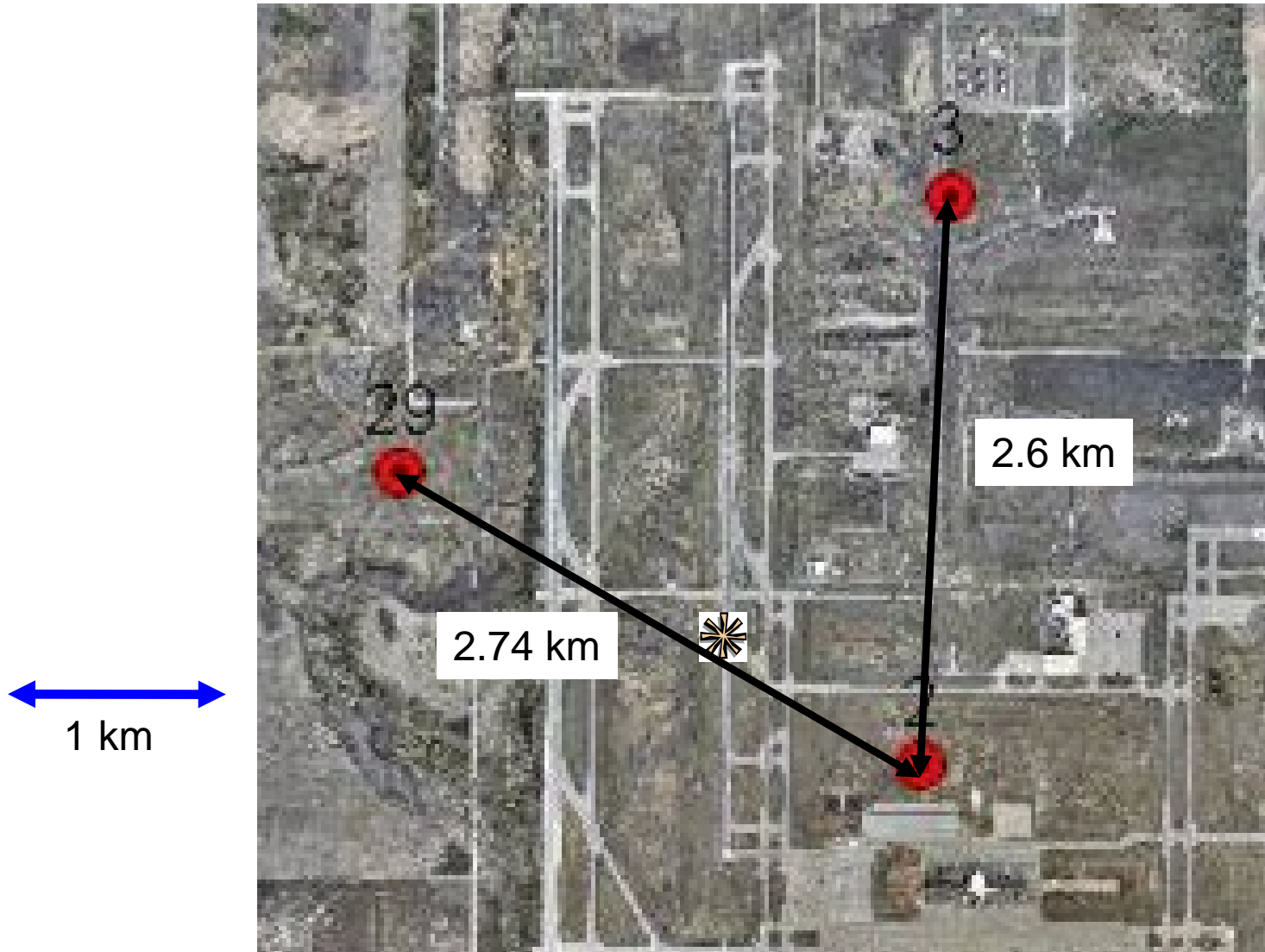
Wind Speed (kts) and Direction Station 2



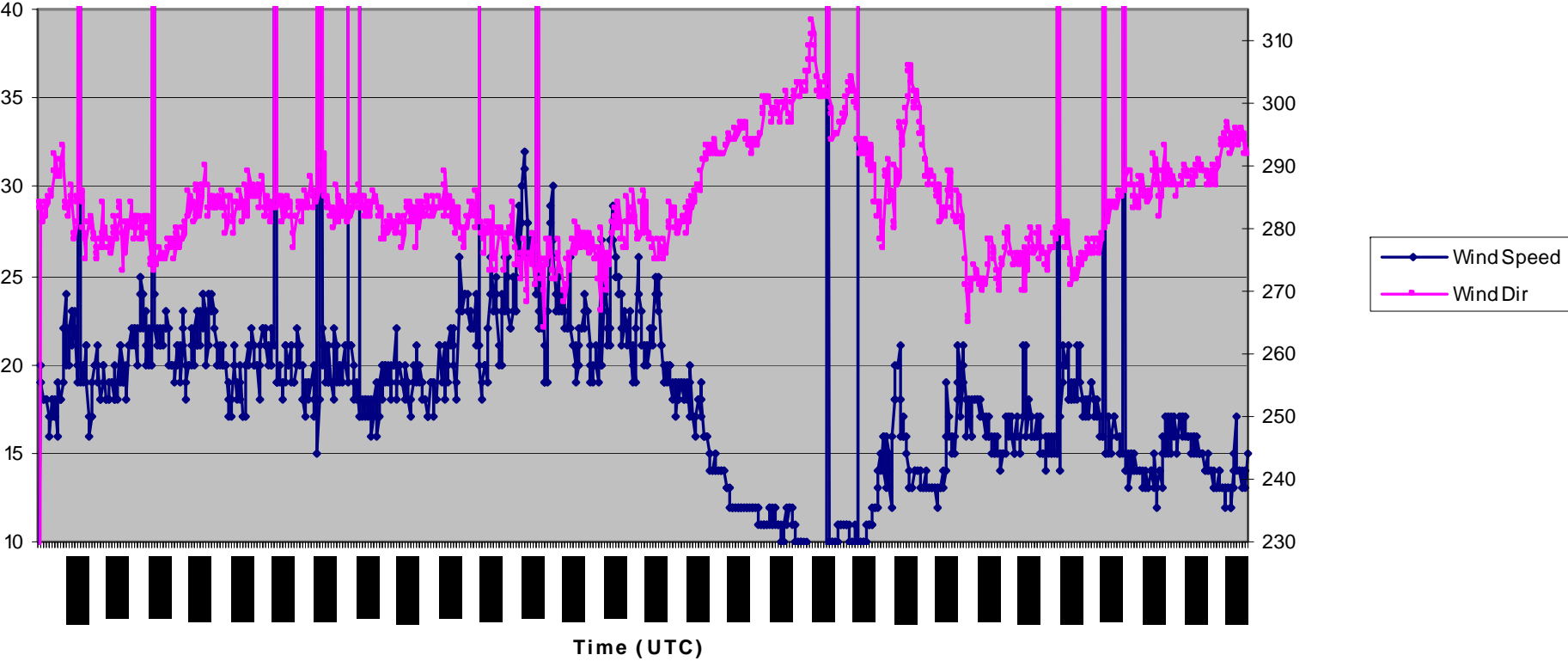
Wind Speed (kts) and Direction Station 2



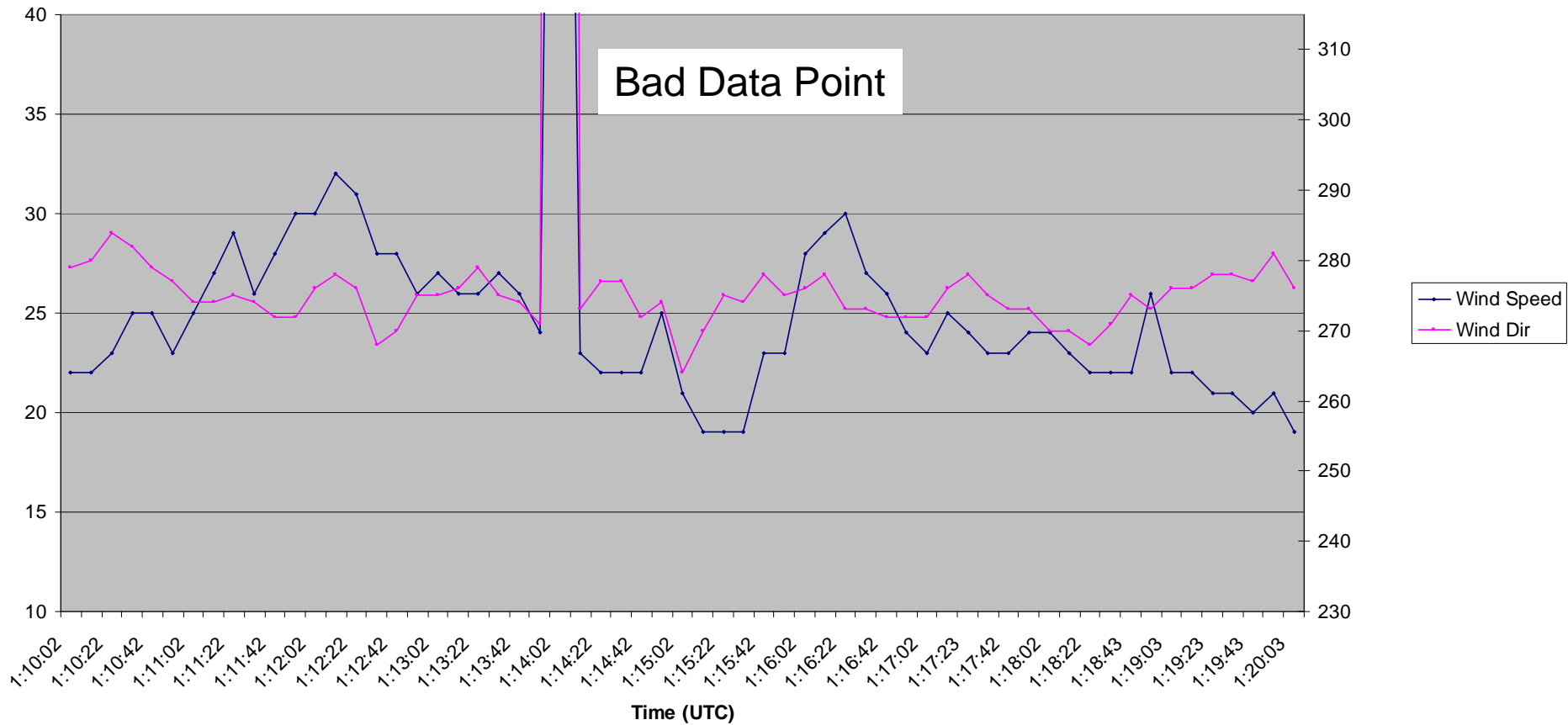
Blow-up: DIA Runways and LLWAS Stations



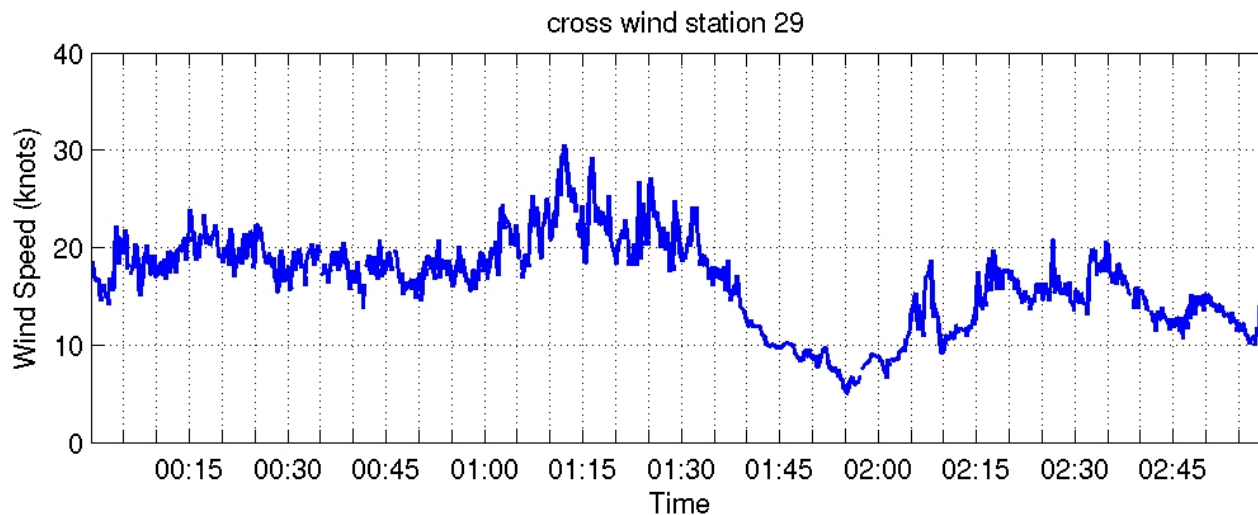
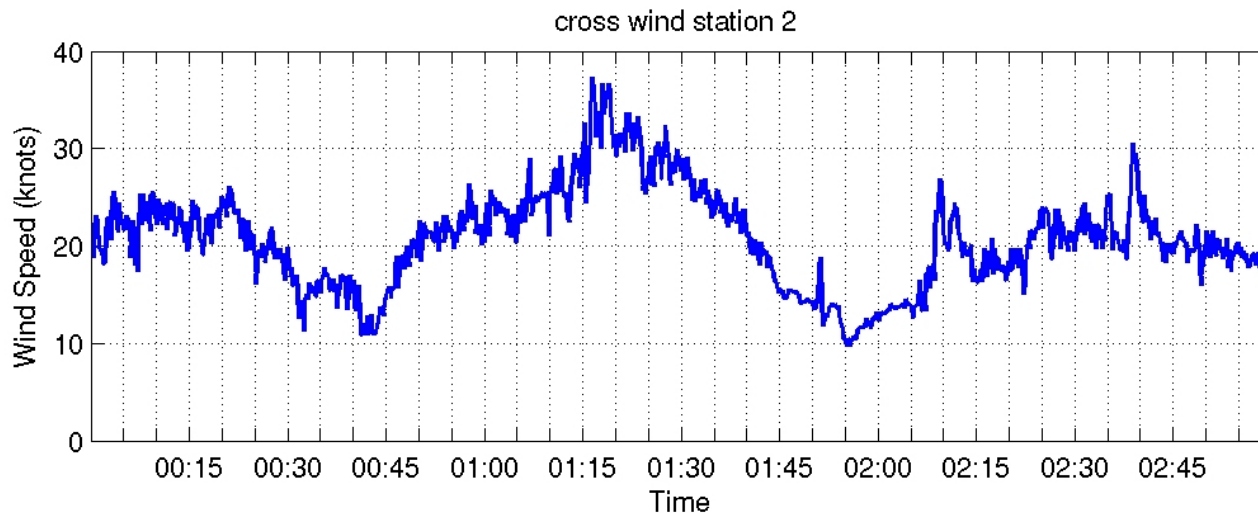
Wind Speed and Direction Station 29



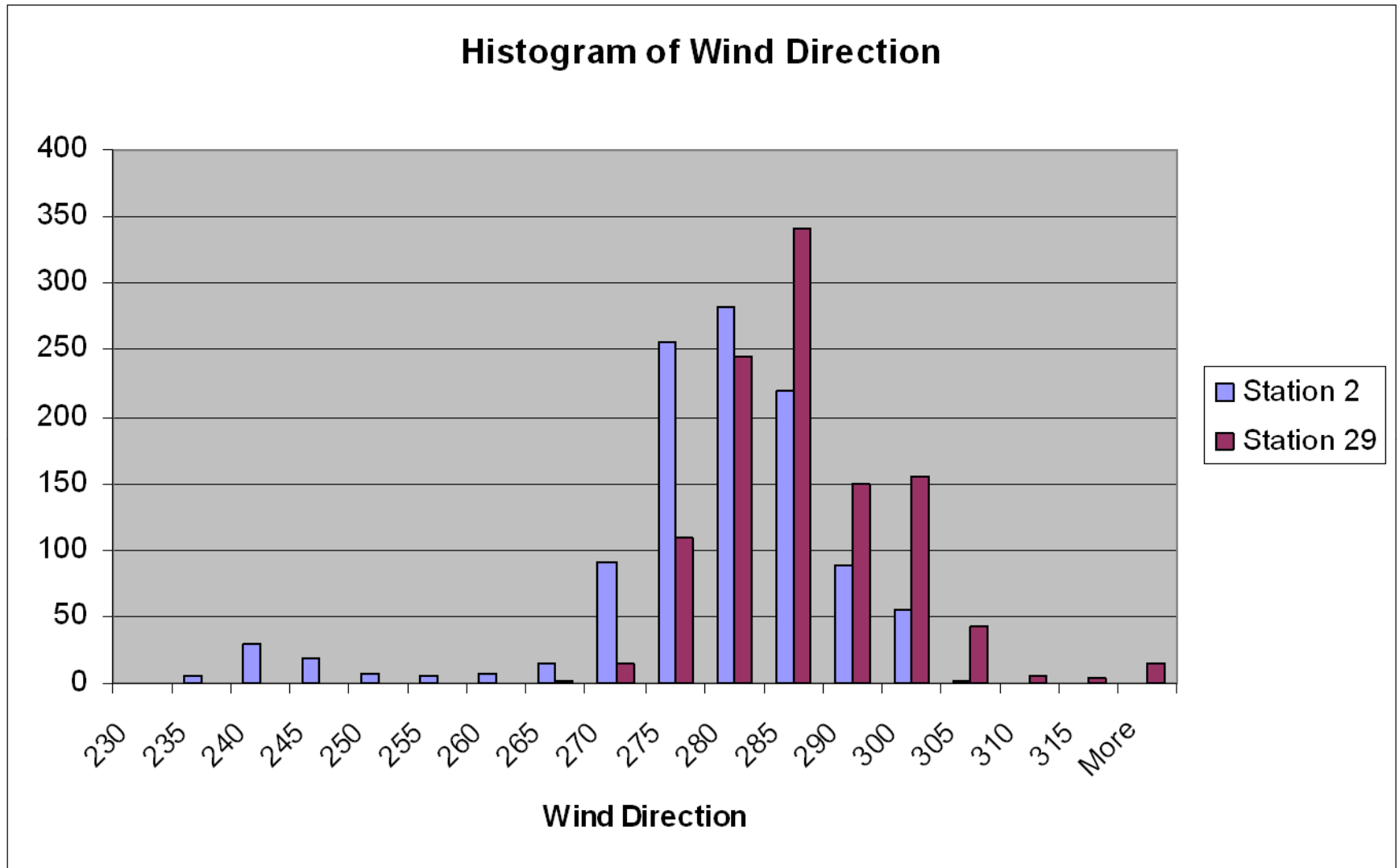
Wind Speed and Direction Station 29



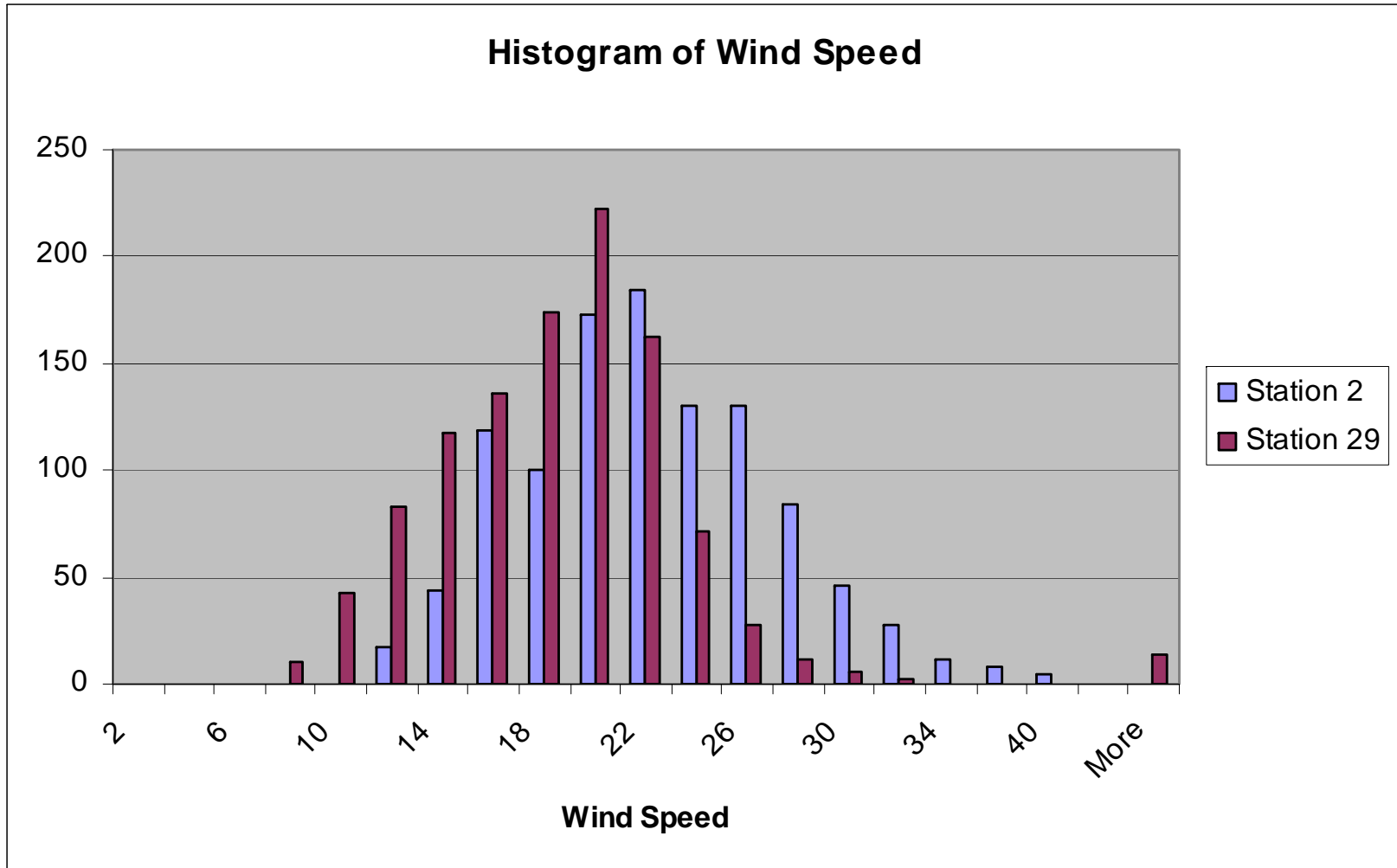
Cross-winds for 34RD via LLWAS Sensors



Histogram of Wind Direction for Station 2 and 29

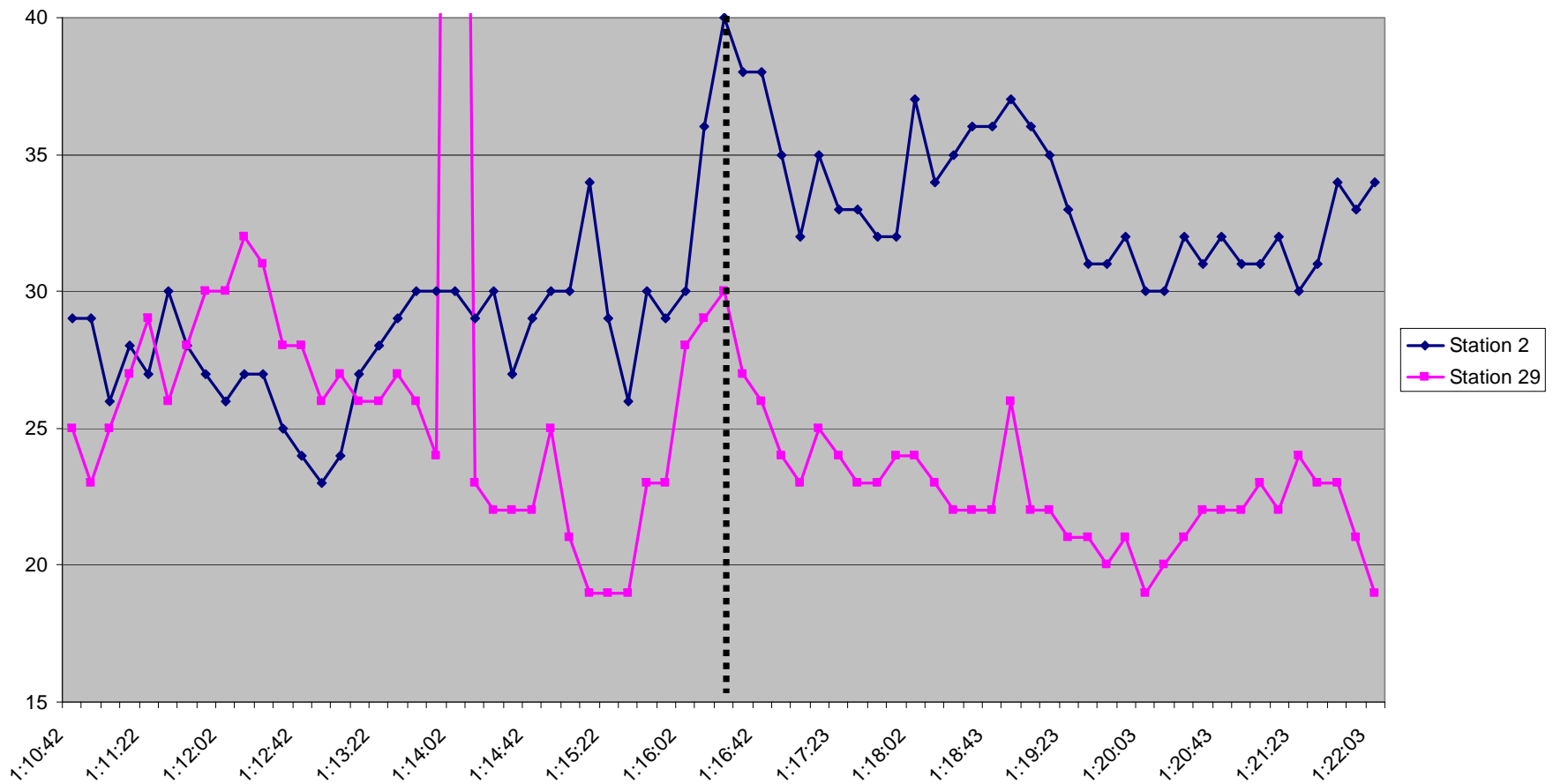


Histogram of Wind Speed for Station 2 and 29



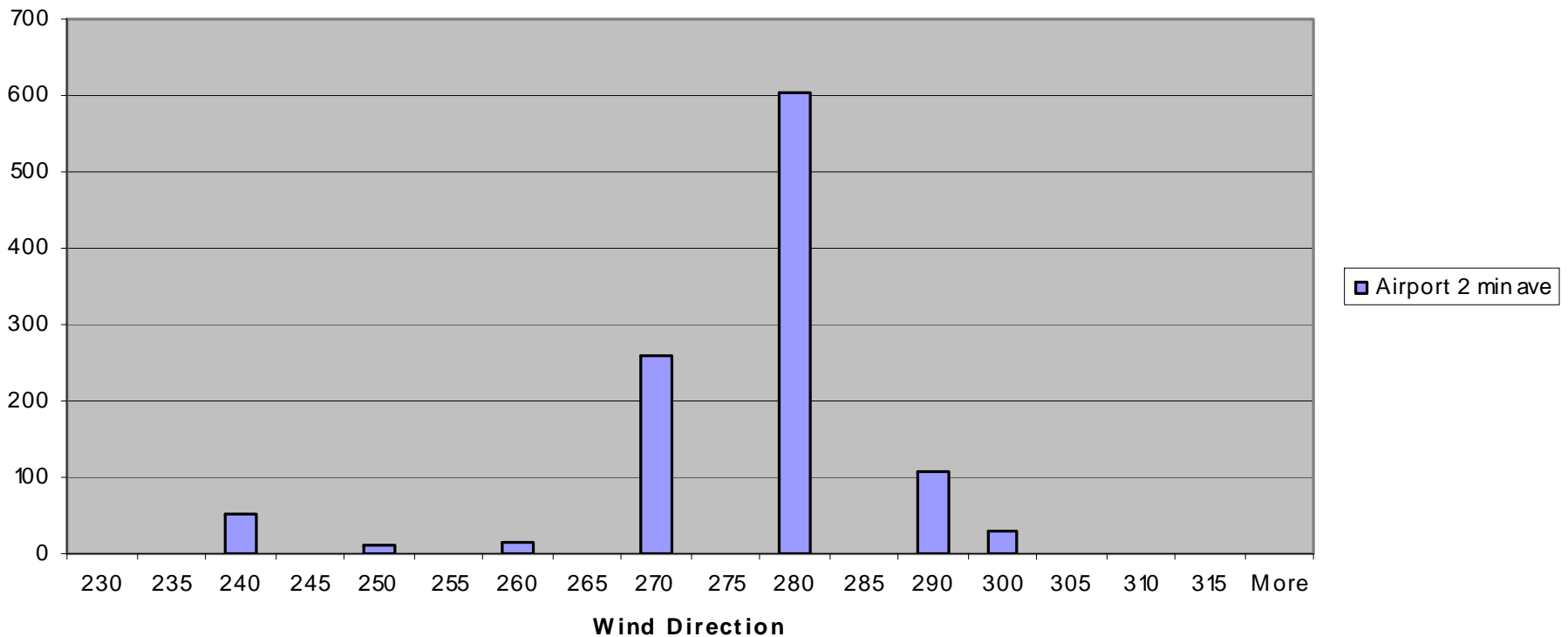
Lack of Correlation Implies Lack of Advection

Wind Speed Station 2 and 29

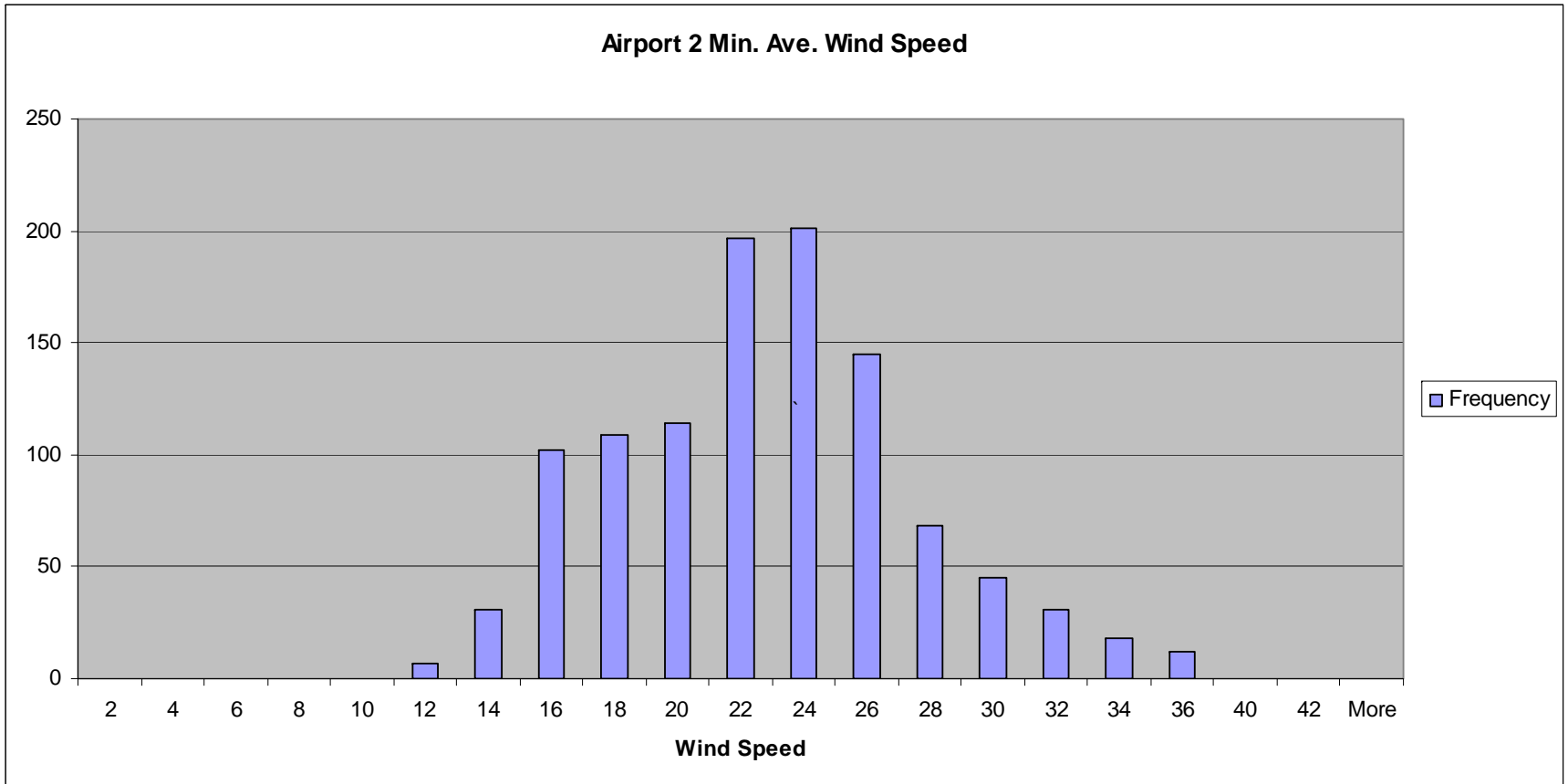


Histogram of Wind Direction for Airport Wind

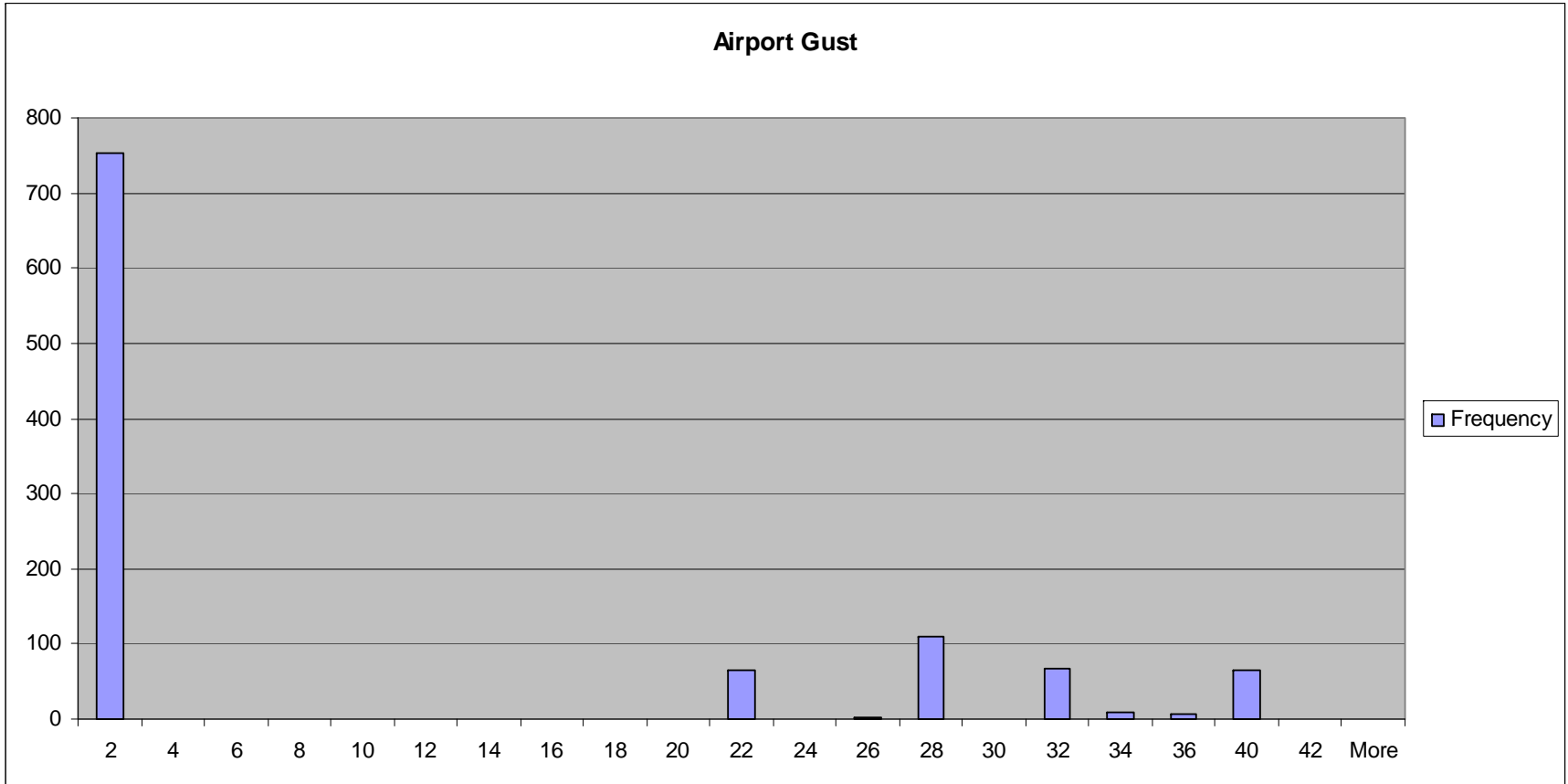
Airport 2 min ave Wind Dir



Histogram of Wind Speed for Airport Wind

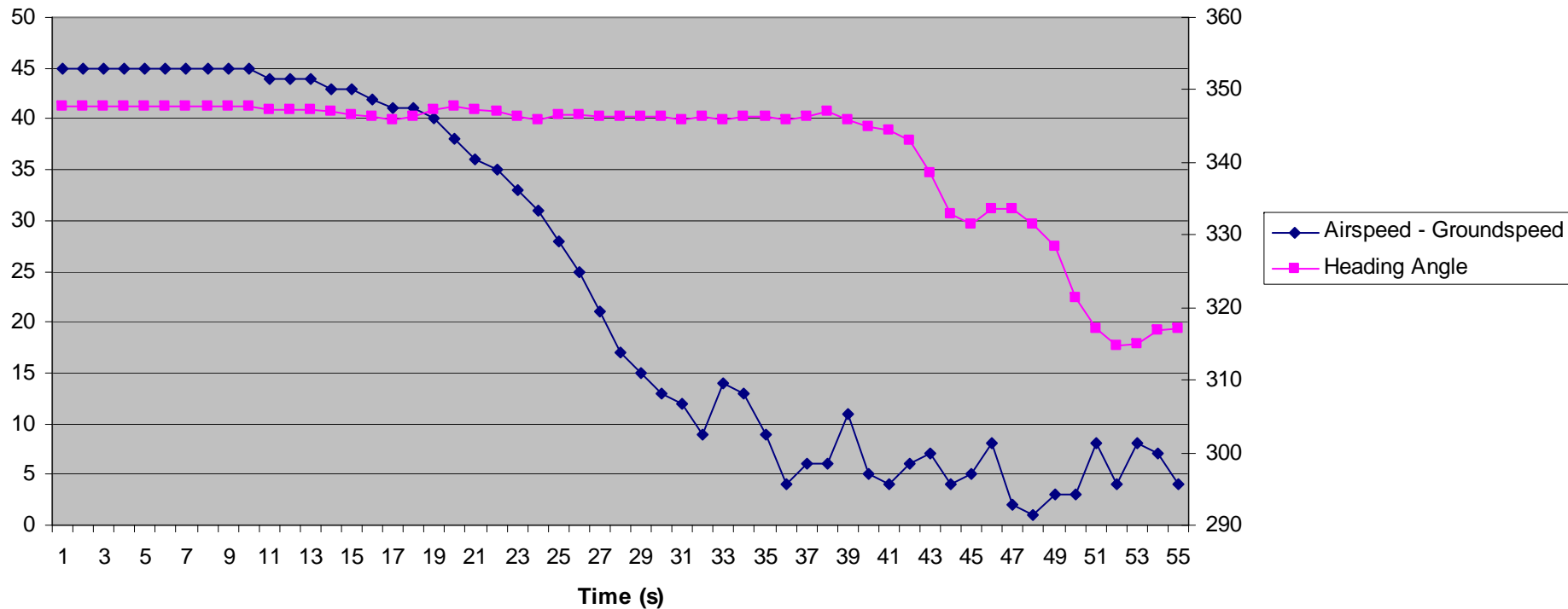


Histogram of Wind Gust for Airport Wind



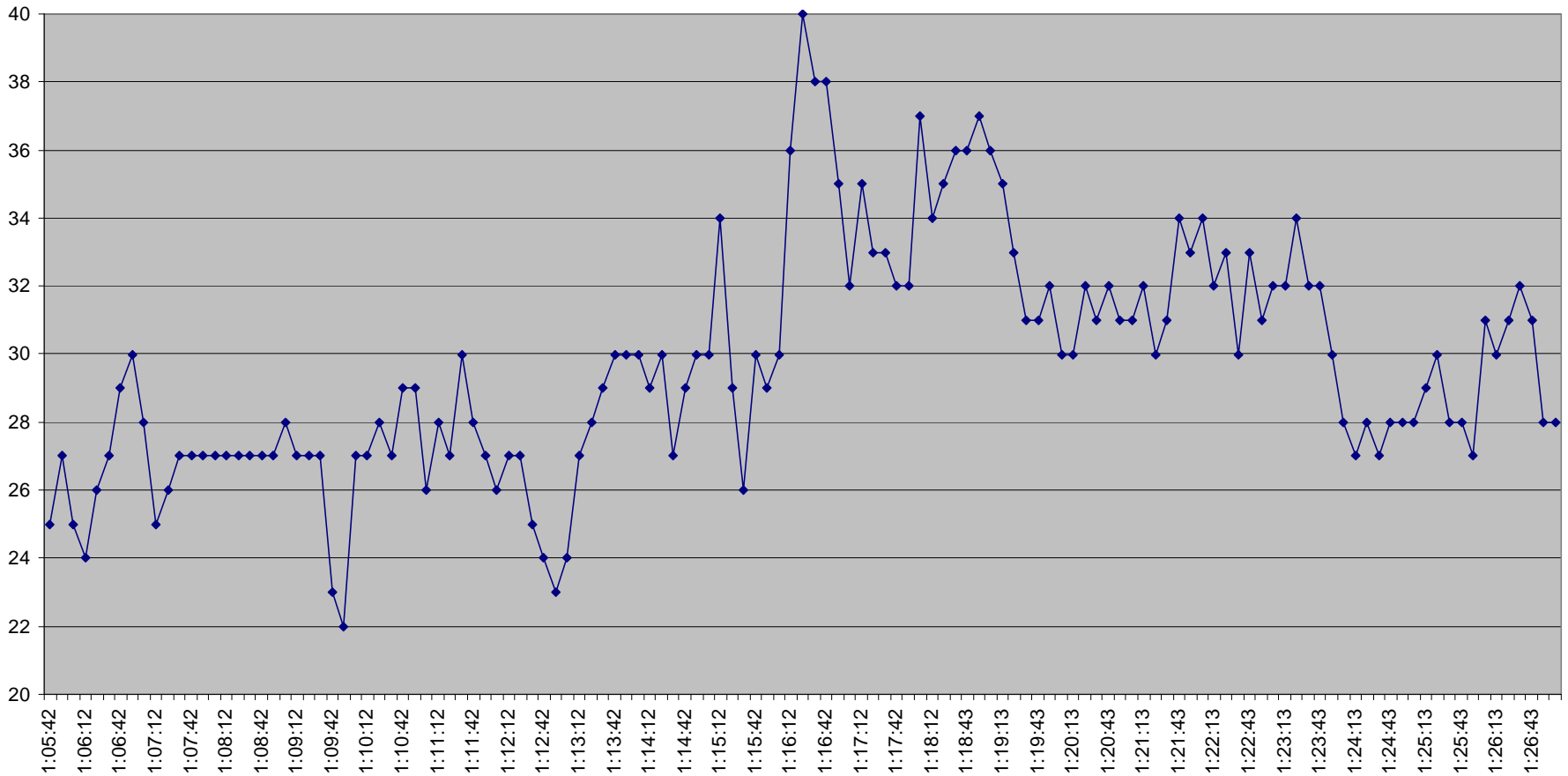
FDR Data: Airspeed – Groundspeed and Heading Angle

Airspeed - Groundspeed and Heading Angle from FDR
(Time Range is approx. 18:17:32 - 18:18:29 MST)

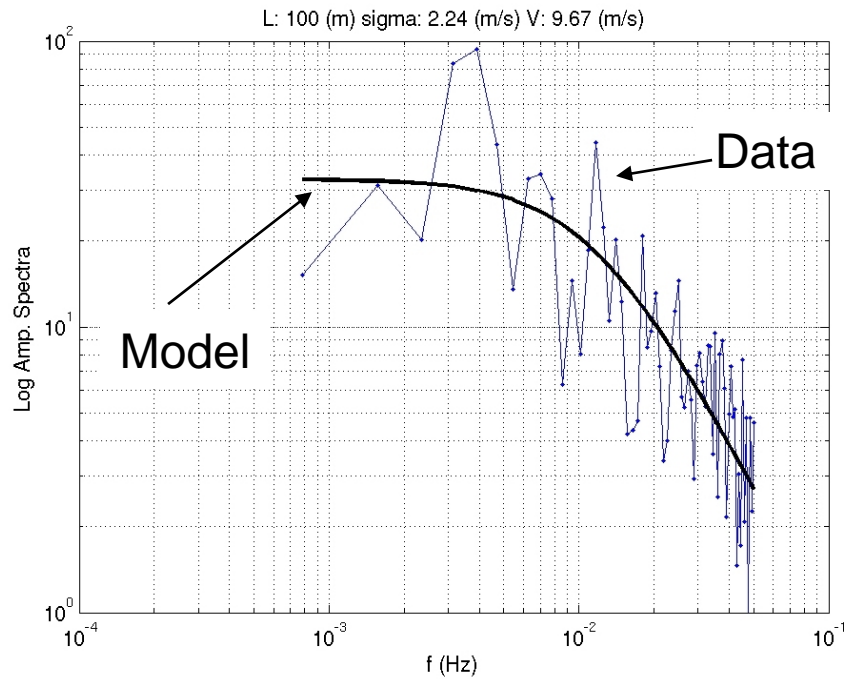
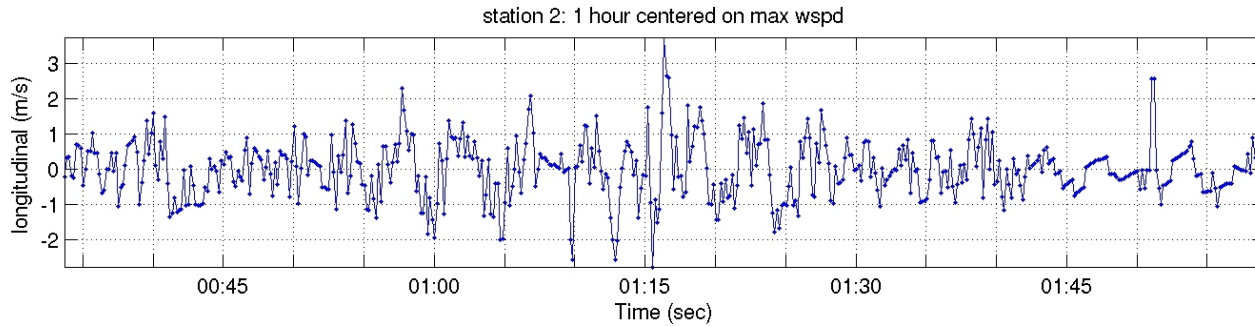


Turbulence Analysis: Station 2

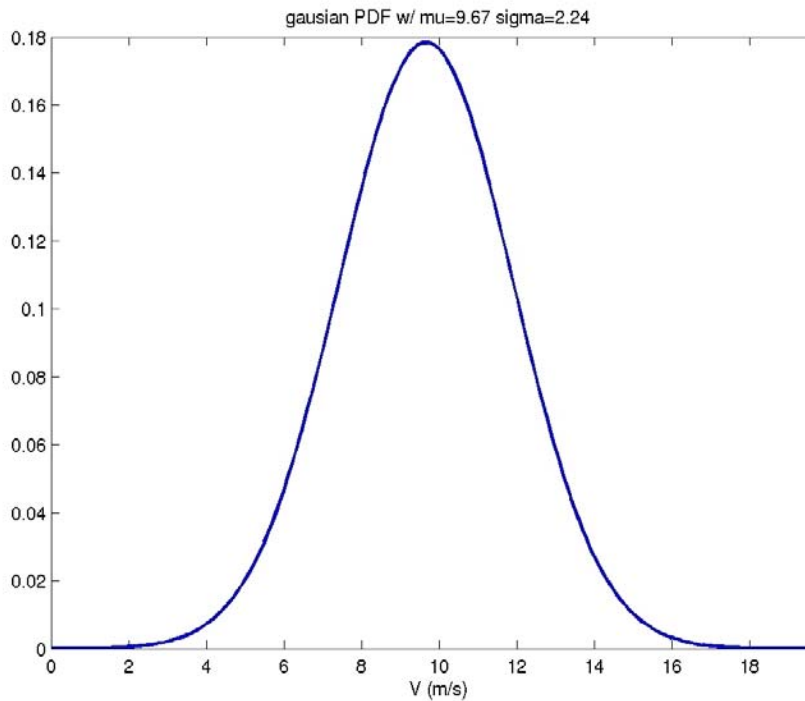
Wind Speed



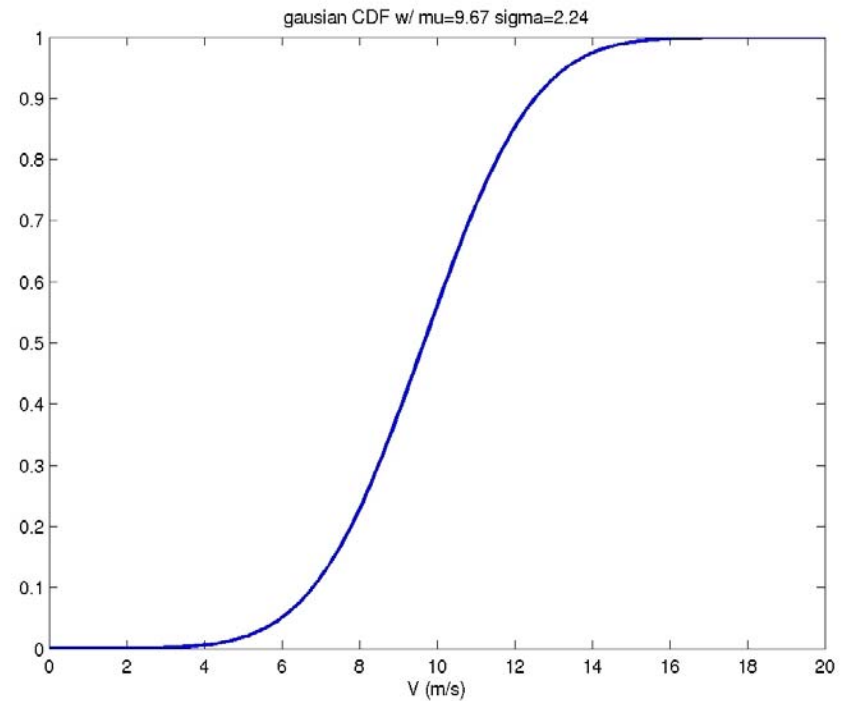
Turbulence Analysis: Station 2



PDF and CDF from Station 2: Assuming Gaussian Statistics



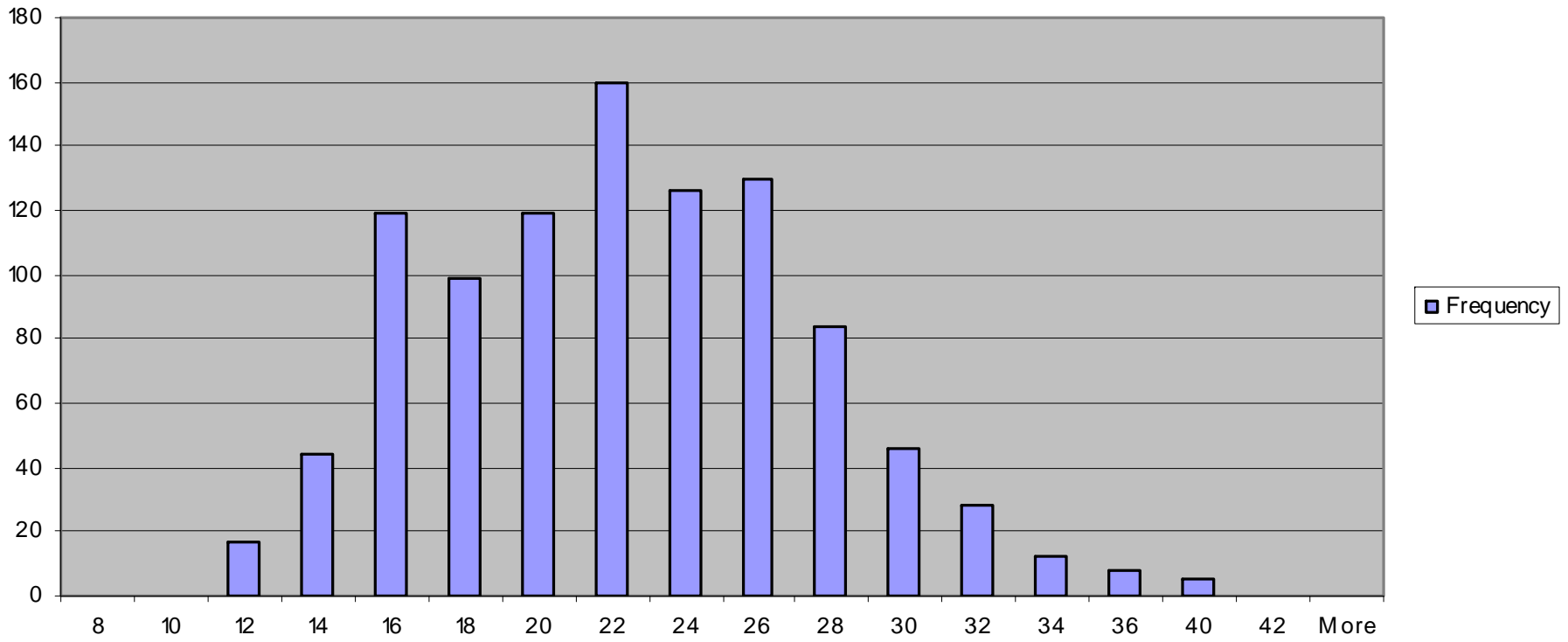
PDF



CDF

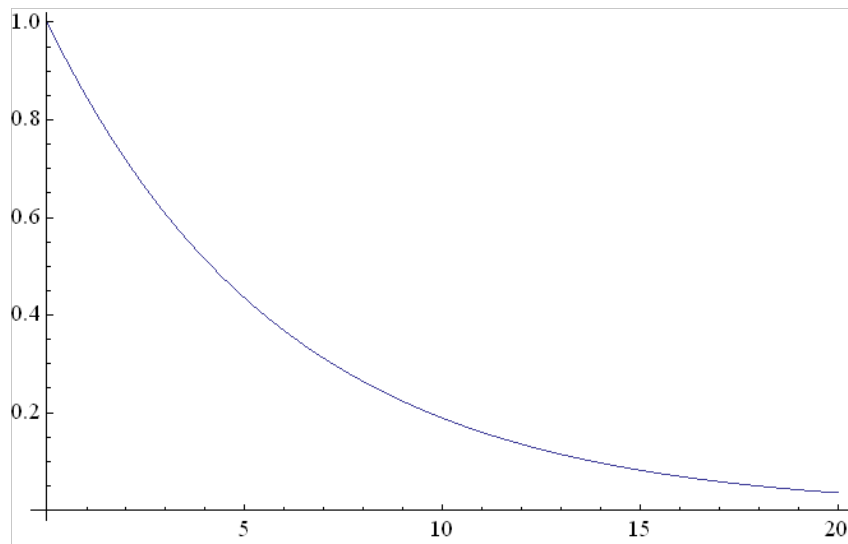
Station 2: Non-Gaussian Statistics

Wind Speed Histogram for Station 2



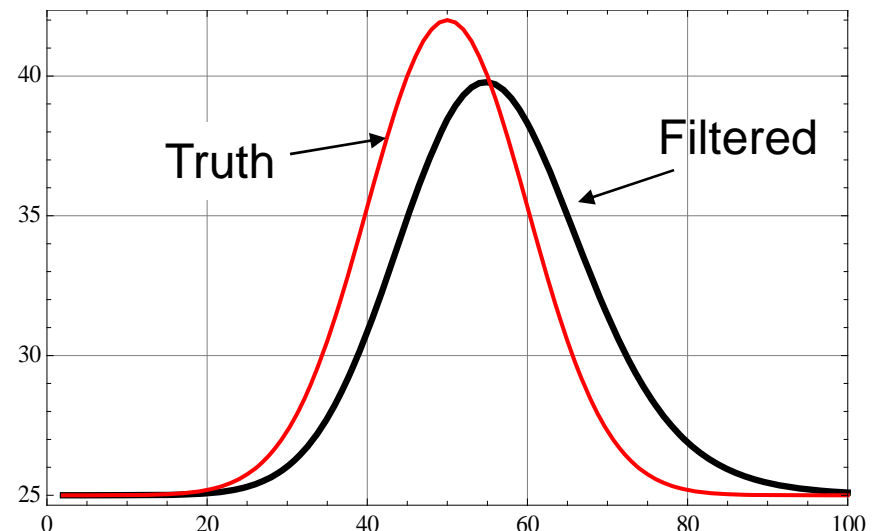
LLWAS Winds: Filtering Inherent in Sensors

Time-domain filter applied
to LLWAS data



Time (sec)

Effect of filter on Gaussian Pulse



Time (sec)