

A Rapidly Deployable, Eddy Covariance Flux System Based on the LiCor LI-7500 Open Path IRGA

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Design Goals:

- ✓ **Portability**
- ✓ **Ease of Setup**
- ✓ **Low Infrastructure Requirement**
- ✓ **Low Power Consumption**
- ✓ **Low Maintenance**
- ✓ **High Accuracy and Reliability**
- ✓ **Low Cost**

System Description:

Fast Response:

Measures: F_{CO_2} H LE $F_{momentum}$

**Uses: Gill WindMaster Pro Sonic
Anemometer**

**LiCor LI-7500 Open Path
IRGA**

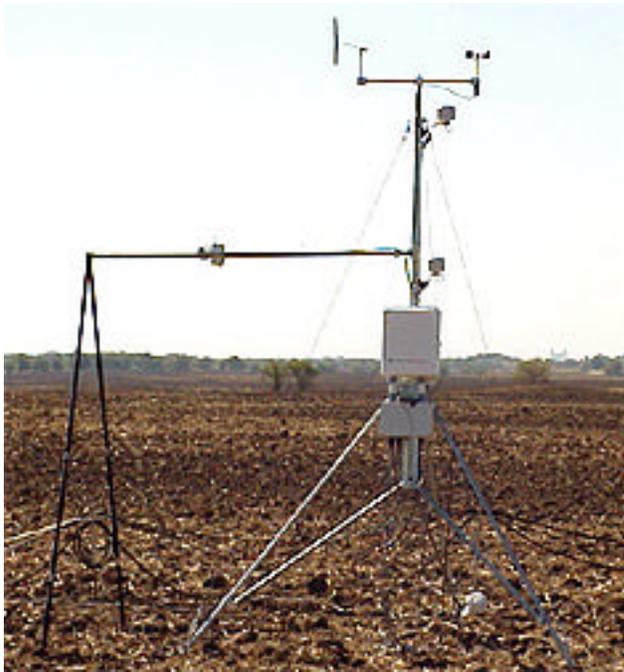
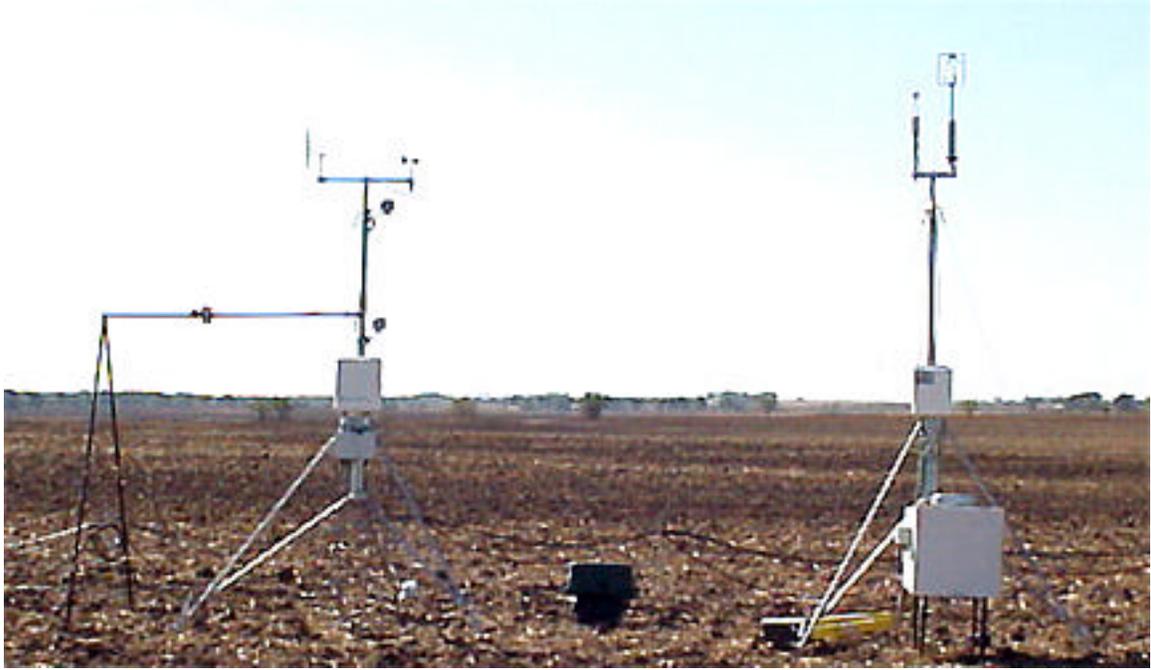
**Toshiba Portege 3110 CT
Notebook Computer**

System Description:

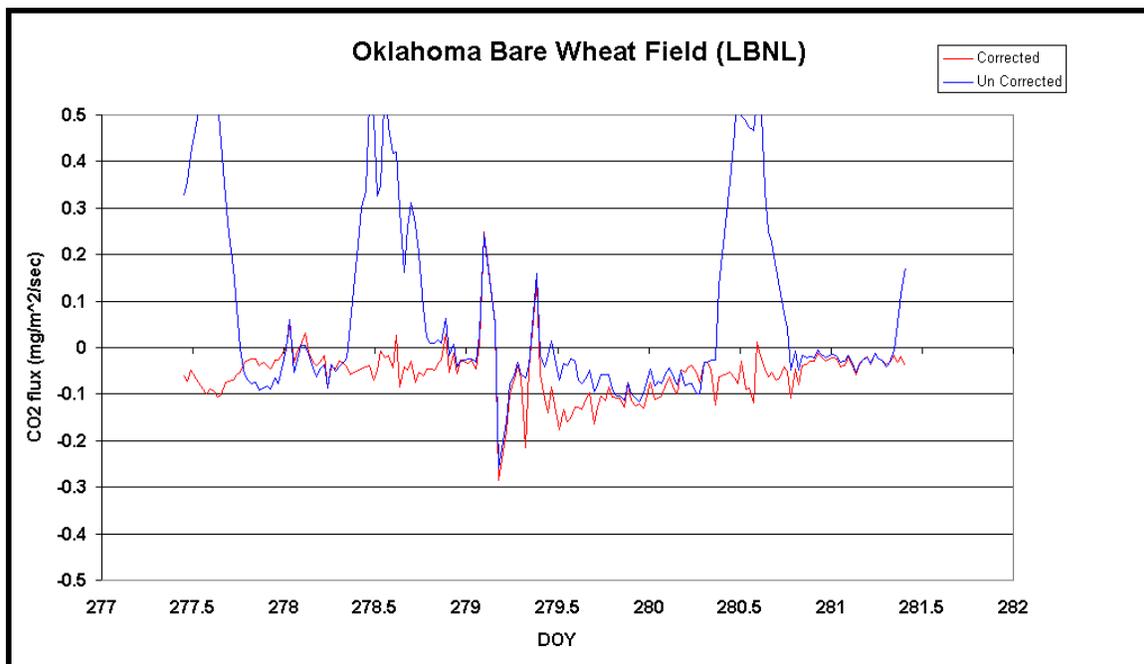
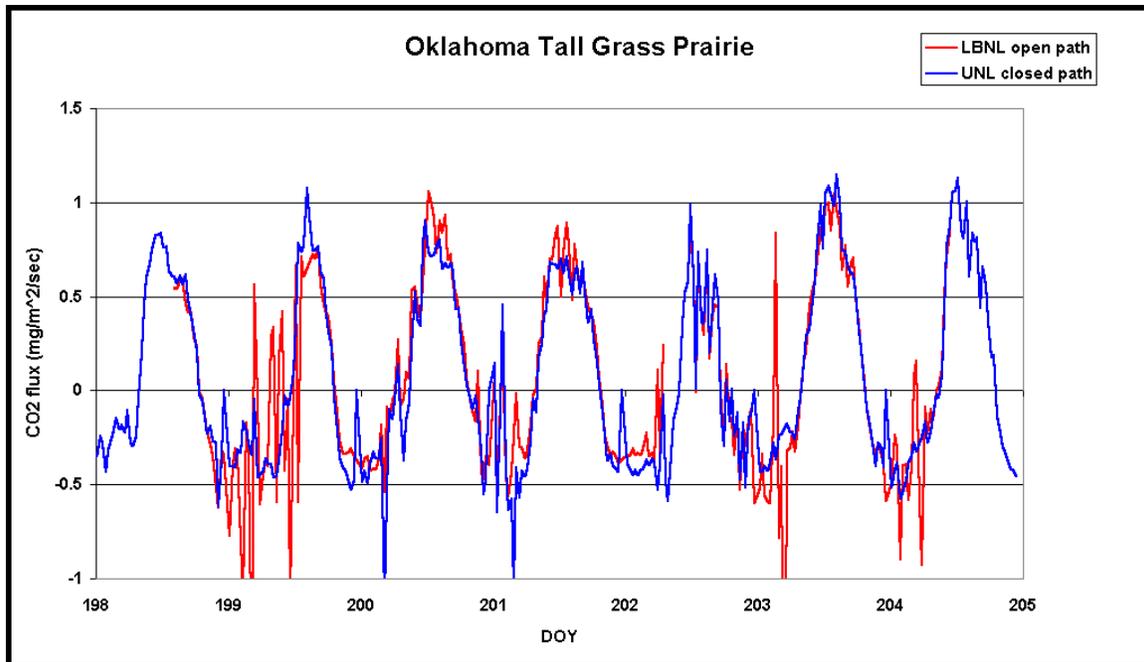
Slow Response:

Measures: **Press, T, u, θ , RH,**
 T_{profile} , $\text{RH}_{\text{profile}}$, $R_{\text{solar in}}$,
 $R_{\text{solar refl.}}$, $R_{\text{far IR in}}$,
 $R_{\text{far IR refl.}}$, **PAR, G_{soil} ,
 dT_{soil}**

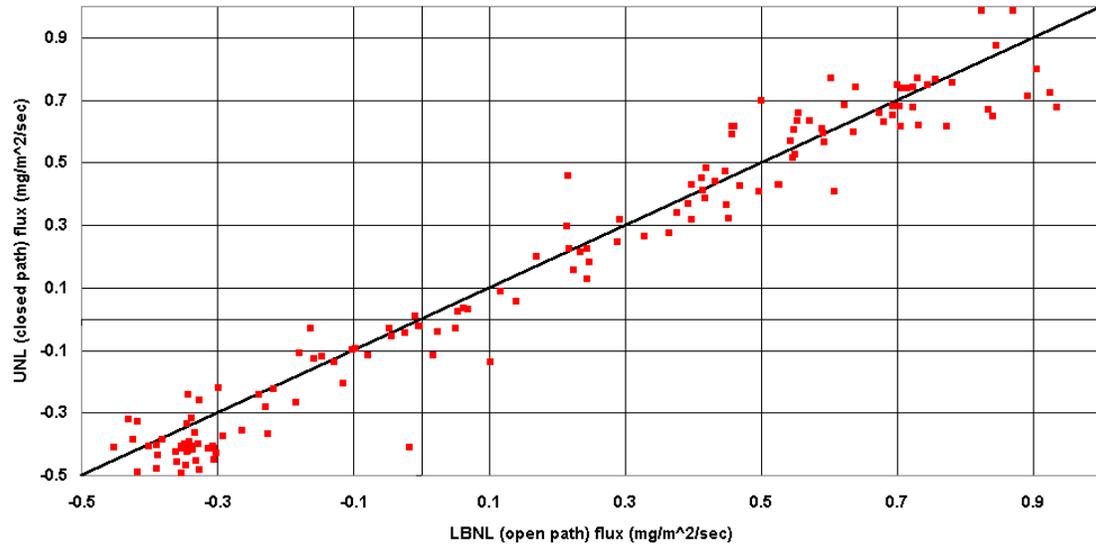
Uses: **CR-23X, Kipp & Zonen**
CNR 1 Radiometer,
Various Other Sensors



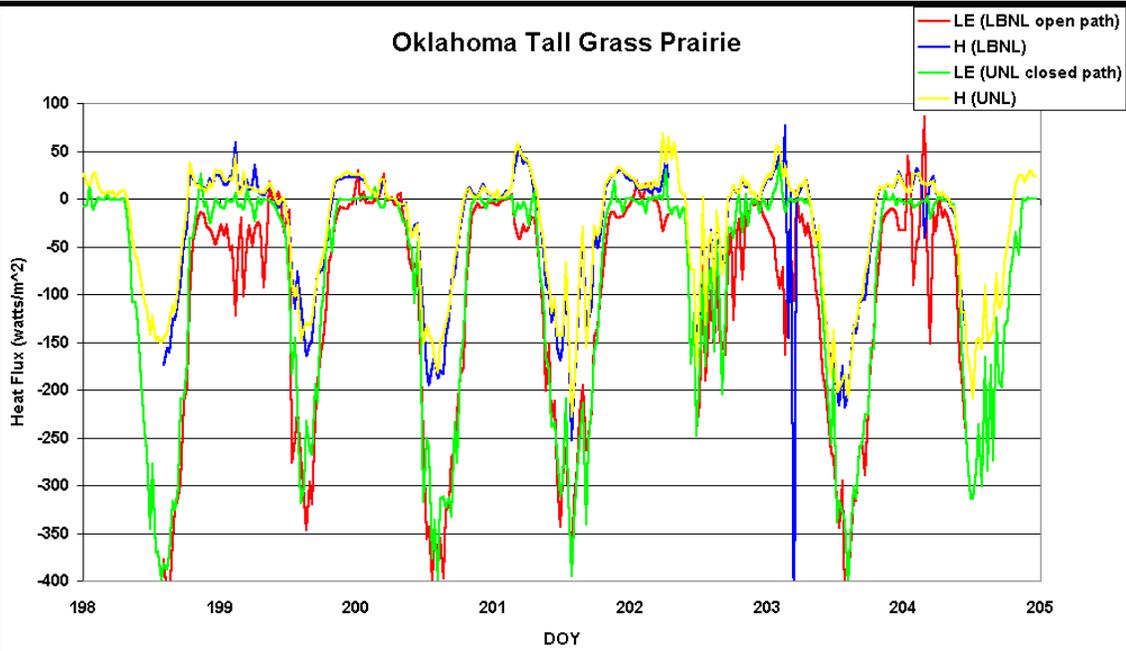
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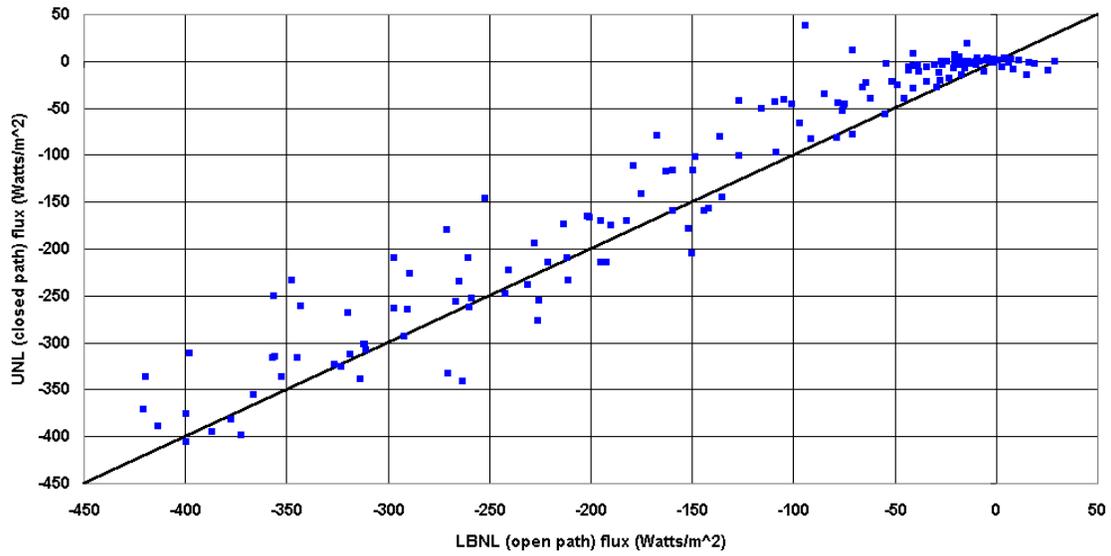
LBNL open path vs UNL closed path CO2 flux(DOY 198 - 204)



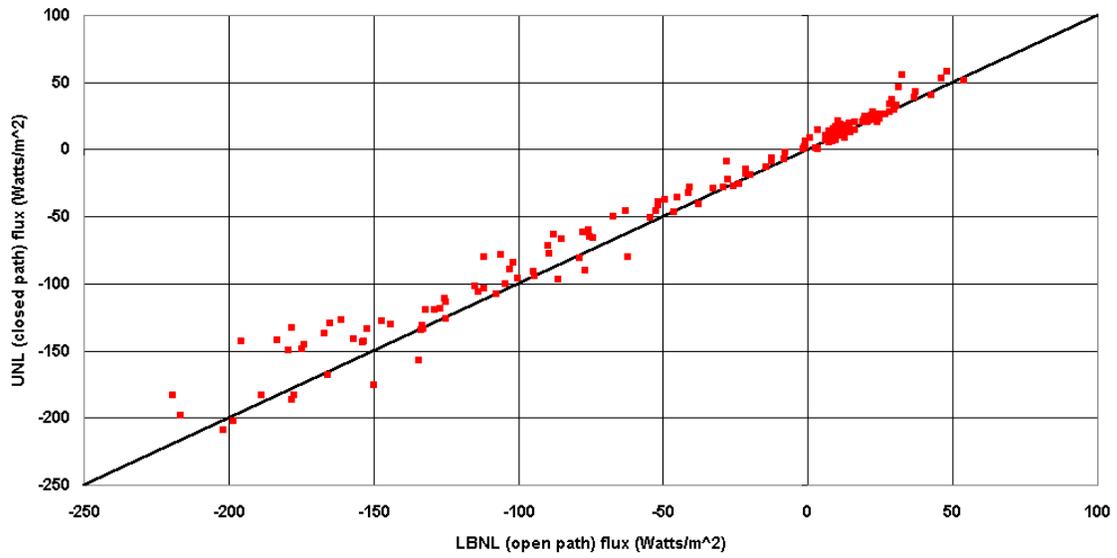
Oklahoma Tall Grass Prairie



LBNL open path vs UNL closed path LE flux (DOY 198-204)



LBNL open path vs UNL closed path H flux (DOY 198-204)



System Specs:

- **Power: 2.5 Amps @ 13.6 Volts**
- **Power Source: Deep Cycle Marine/RV Batteries with Solar or Line Trickle Charger**
- **Except for 2 or 3 Custom Fabricated Parts, Entire System is Made of “Off the Shelf” Components**
- **Fits into a Van or Pick Up Truck**
- **Can be Set Up and Operated by One Person**
- **Set Up Time (1 Person) is About 3-4 Hours**

System Validation:

- **1st AmeriFlux Tall Grass Prairie Site (Shidler, OK Shashi Verma)**
- **July 16 (DOY 198) – July 22 (DOY 204)**
- **2nd AmeriFlux Wheat Site (Ponca City, OK Shashi Verma)**
- **Oct 3 (DOY 277) – Oct 7 (DOY 281)**
- **AmeriFlux System: Gill R3 & LiCor LI-6262 IRGA (closed path)**
- **1st Period had Large CO₂ Fluxes**
- **2nd Period had Very Small CO₂ Fluxes**