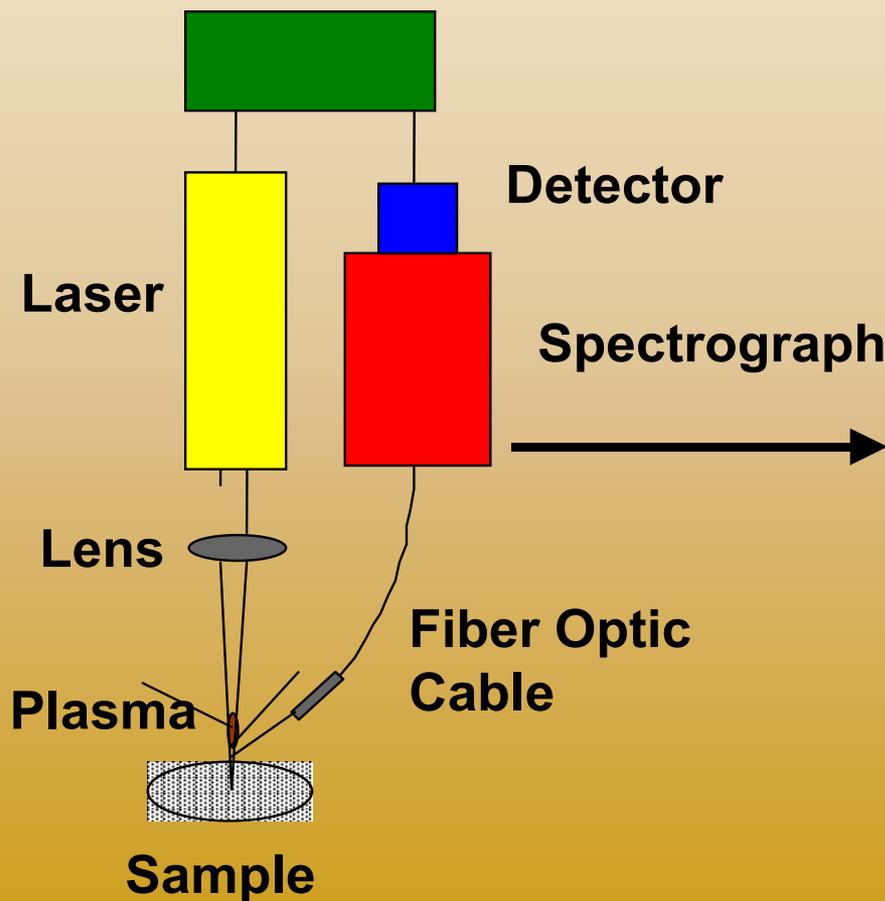
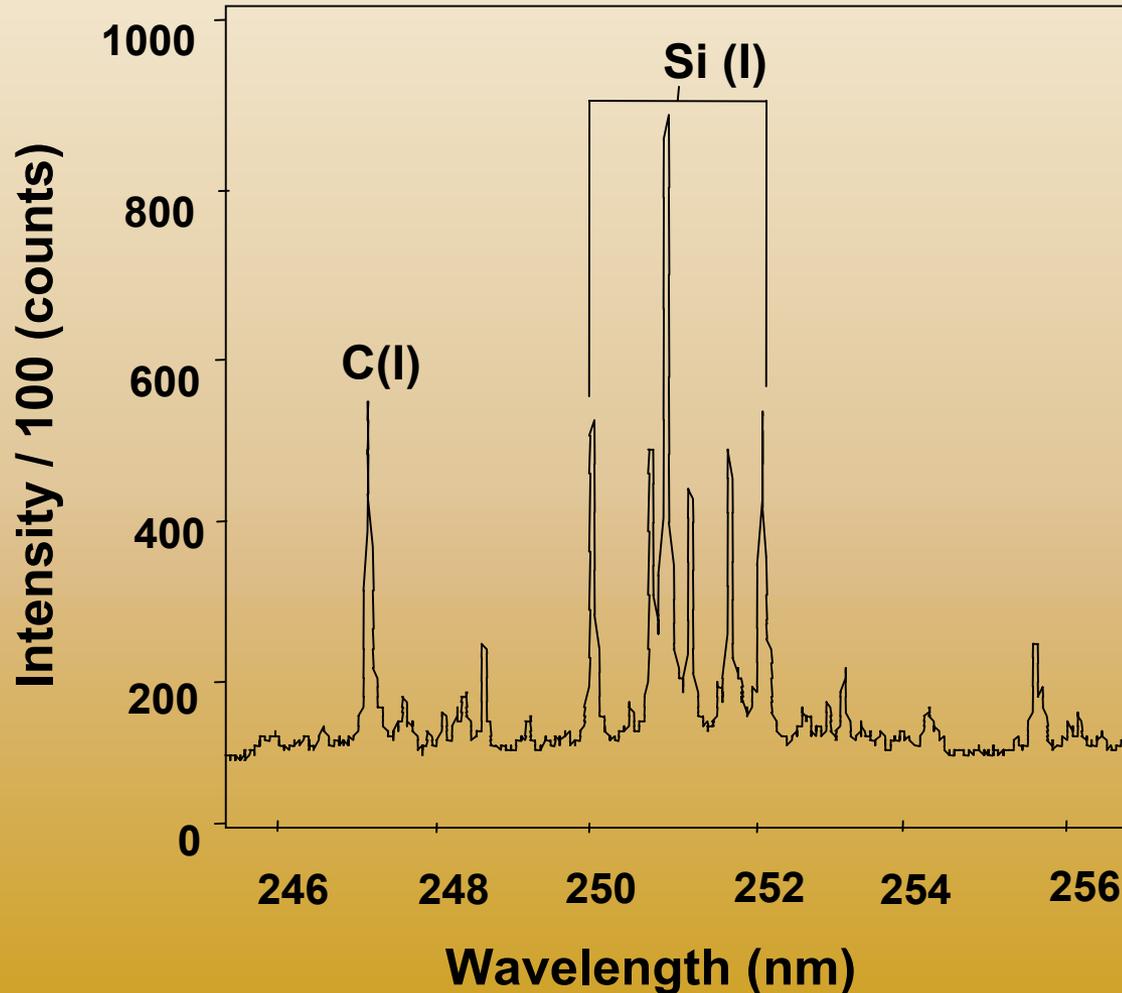


Schematic of LIBS Instrument

Computer Controller
(Handheld, Laptop, PDA)



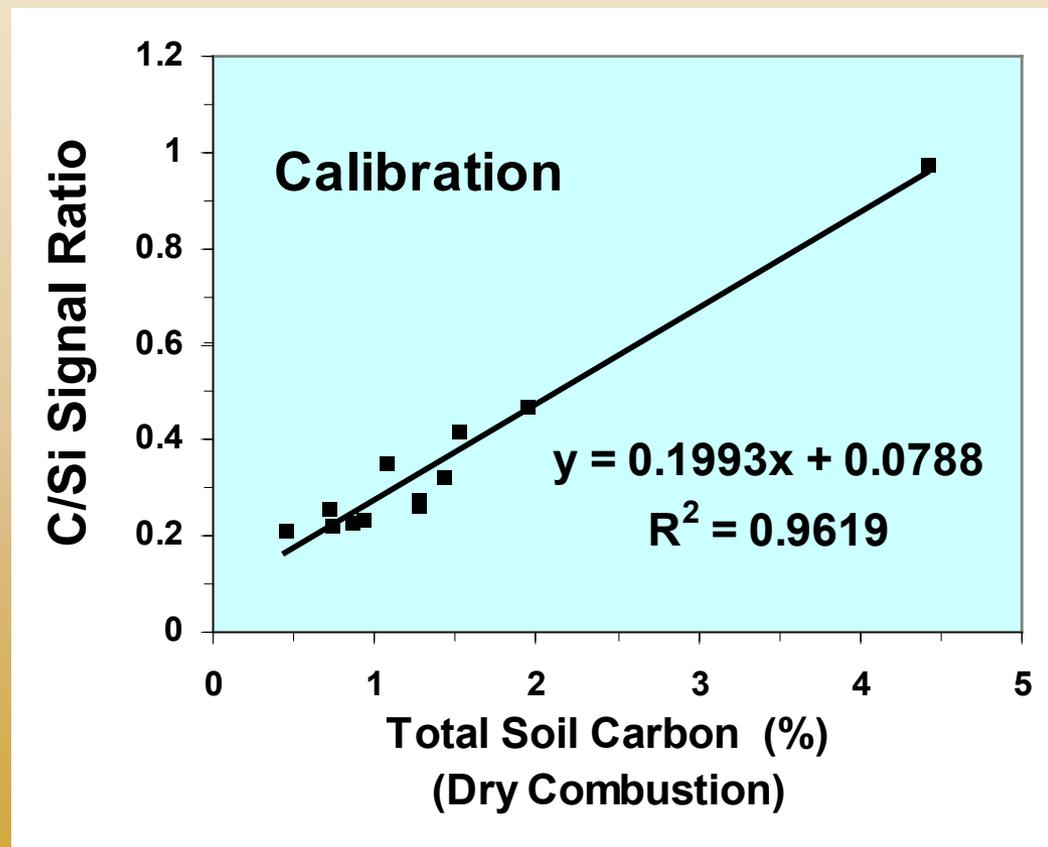
LIBS Spectrum of C, Si in Soil



Calibration Curve: LIBS C/Si Ratio

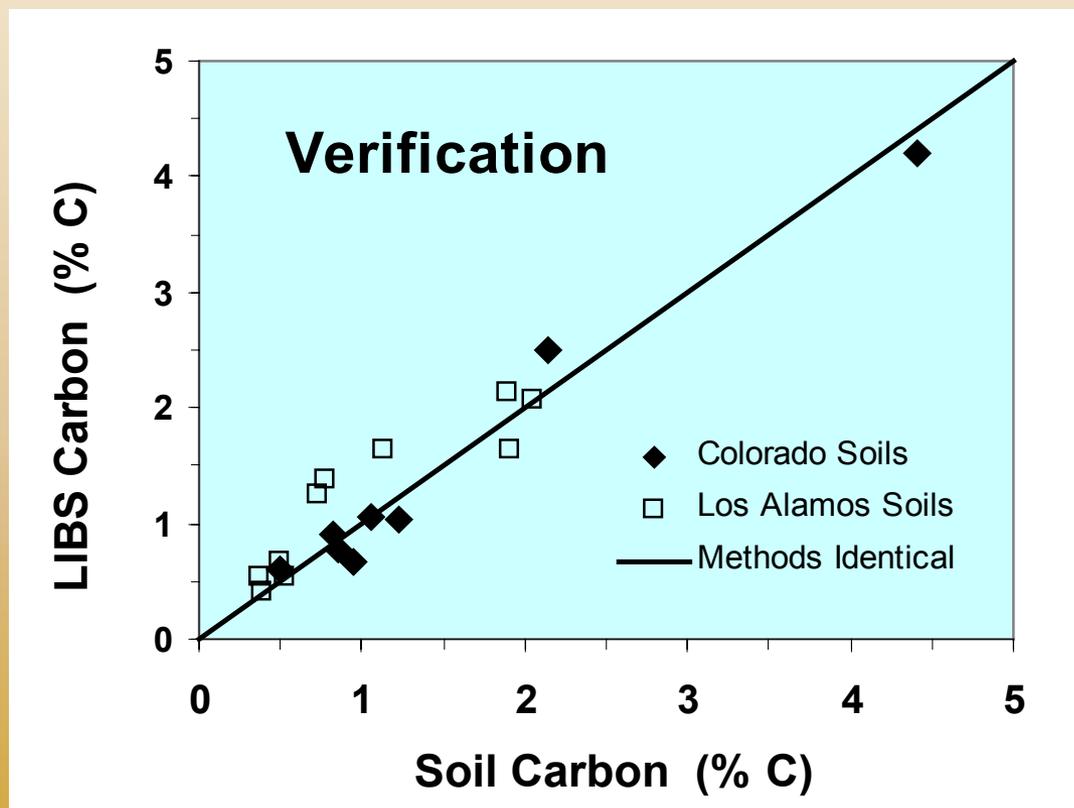
12 Samples--
Soils from eastern
Colorado

Does calibration
work for different
soils?



LIBS %C and Dry Combustion %C

Calibration held
for soils of
different genesis



See *Journal of Environmental Quality*, Nov.-Dec 2001

LIBS Analysis of a Soil Sample

Laser spot size is approximately 0.5 mm dia.

Analytical information from within the spot area

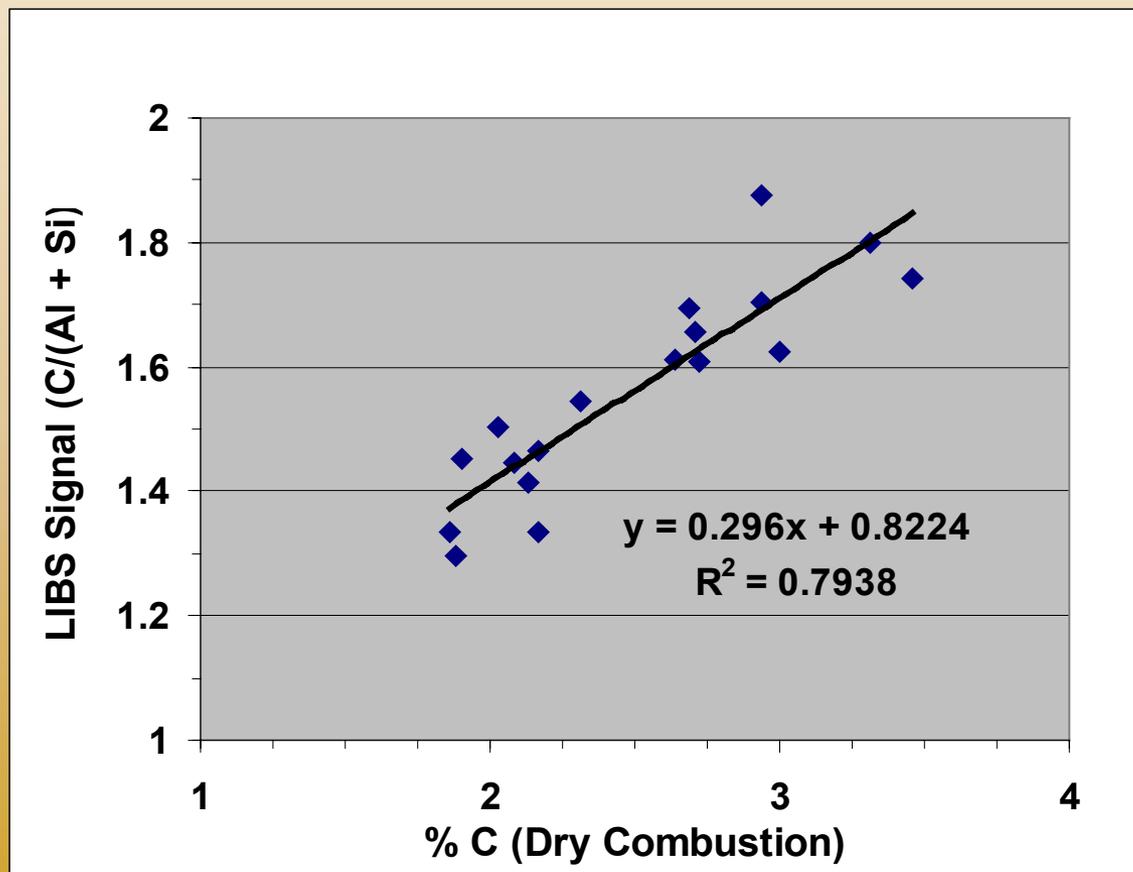
Cycling time of laser allows repeated sampling in different spots within same sample



LIBS Analysis of NRCS Soils

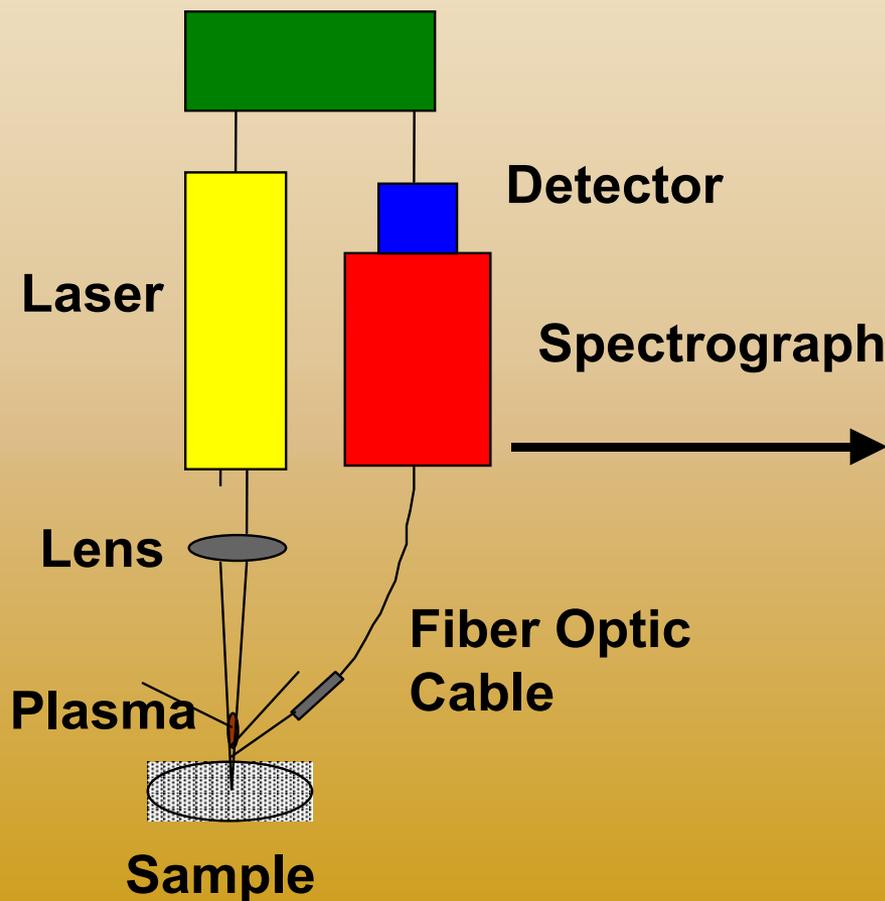
Wabash Series, 4% Sand, 63% silt, 33% clay; Analysis in air

Good Response over range of carbon concentrations



Schematic of LIBS Instrument

Computer Controller
(Handheld, Laptop, PDA)



Conclusions—LIBS Calibration

Daily calibration data are reproducible and stable

Good correlation between LIBS signal and % C (Dry Combustion) for a series

Variation in data from USDA-NRCS samples :

- **Instrumental alignment difficulties**
- **Analytical difficulties (dust, etc.)**

New Data from different configuration and sample stage (Argon, etc.)