Continuous Measurement of PM_{coarse} in Atlanta, GA

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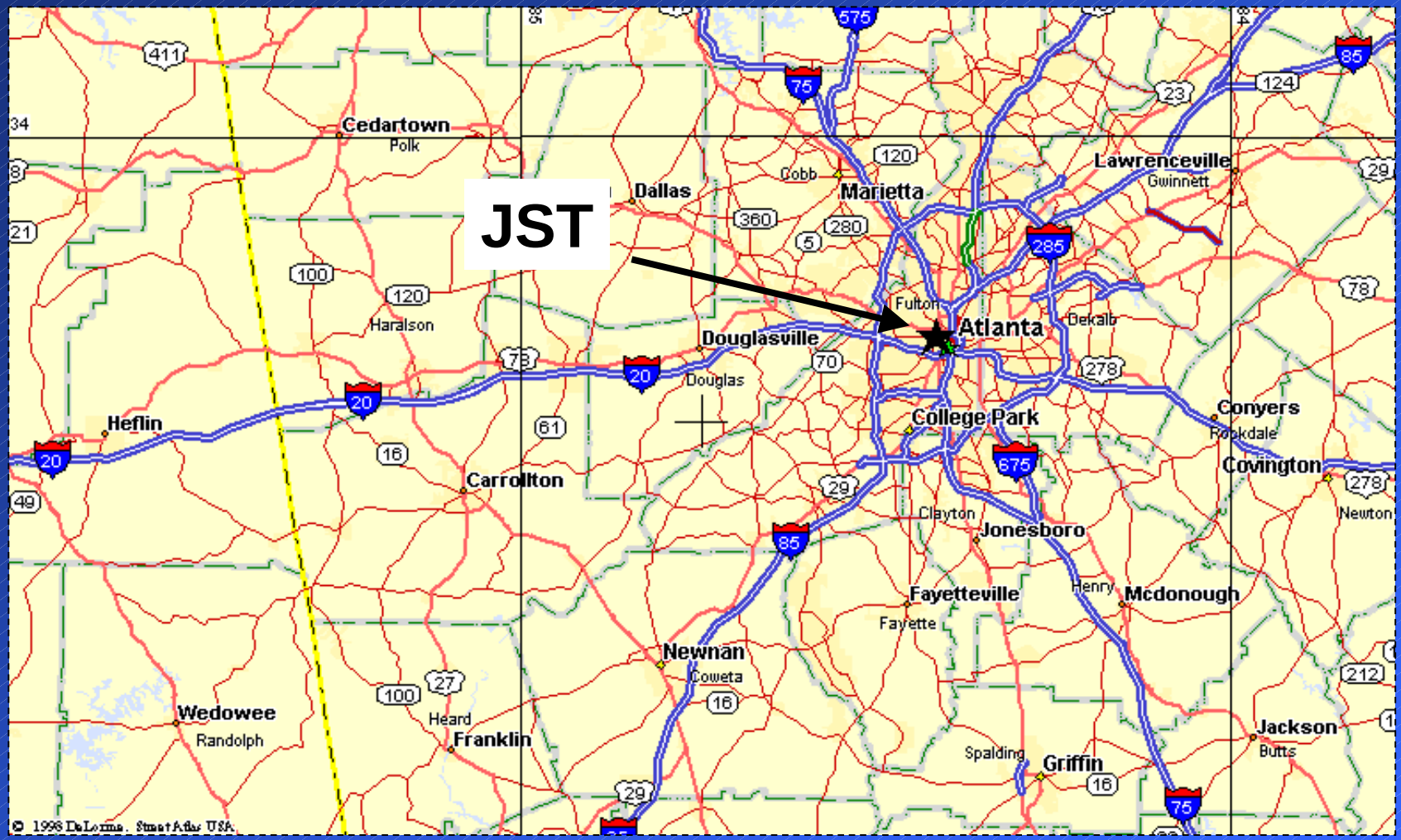
AAAR 2002
Charlotte, NC

Motivation

- EPA evaluating need and form of PM_c standard (incl. methodology)
- Provide source attribution insights
- Provide more detailed temporal information for health studies
- Cost effective (if it works): part of SEARCH strategy to implement continuous techniques

Location of Study Site

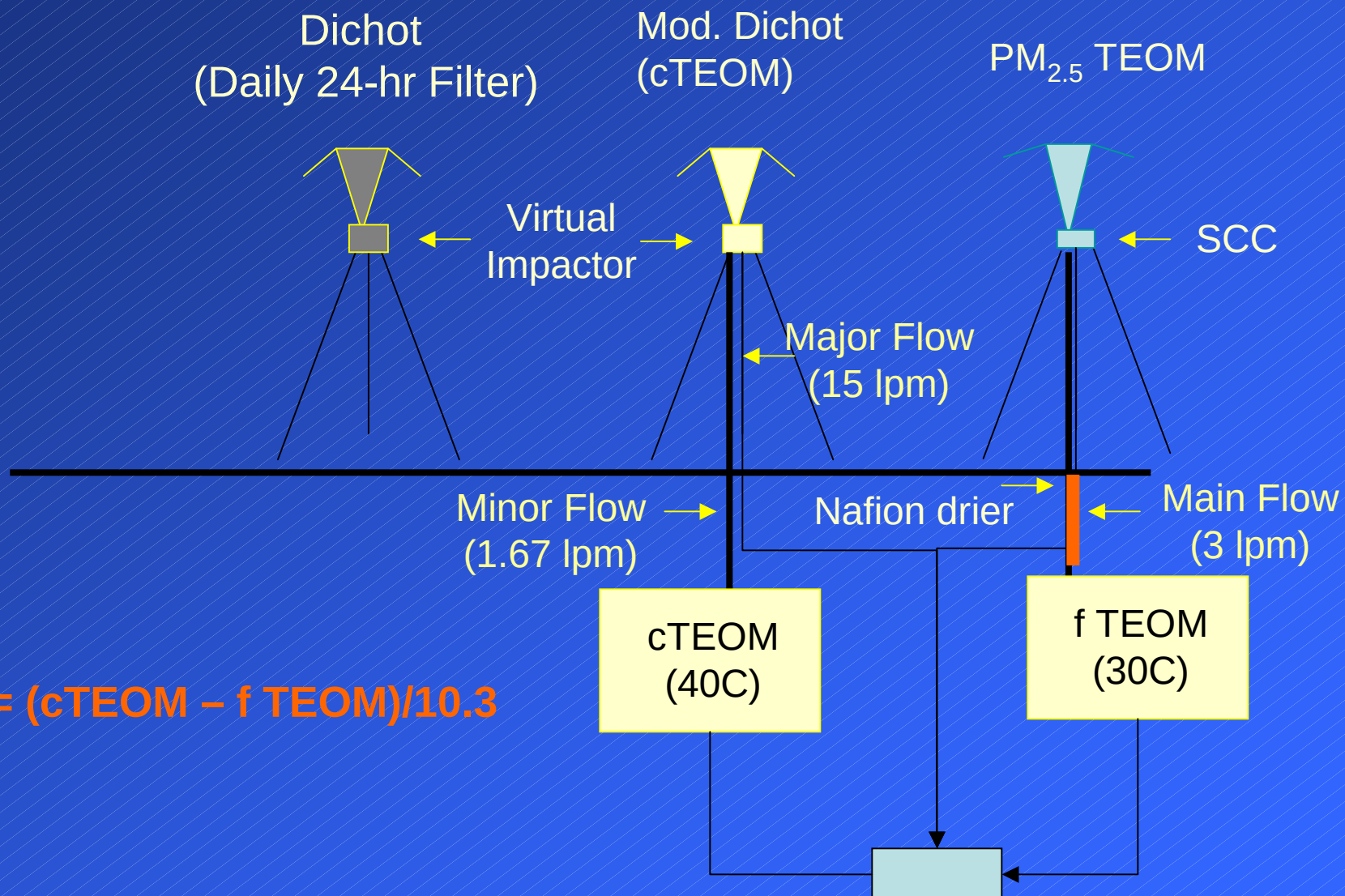


Jefferson Street (JST)
Atlanta, GA

SEARCH - Jun. 1998 to Dec. 2005
ARIES - Aug. 1998 to Aug. 2003
ASACA - April 1999 to Dec. 2005
MERCURY - 2002

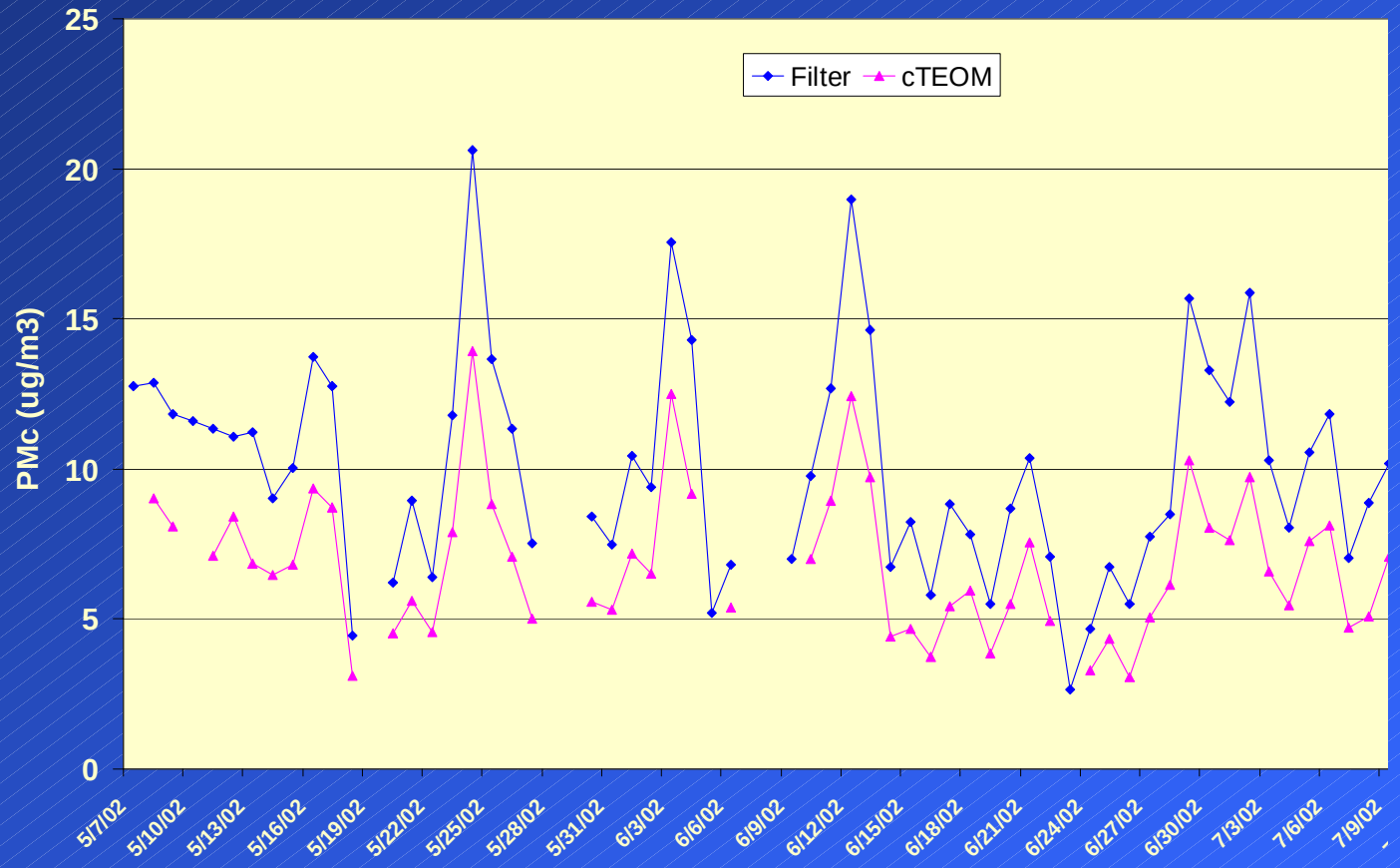
EPA SuperSite - August 1999
ESP01,02,03 – Jul. 2001, Jan. 2002, Jul. 2002
ANARCHE - August 2002

Measurement Setup

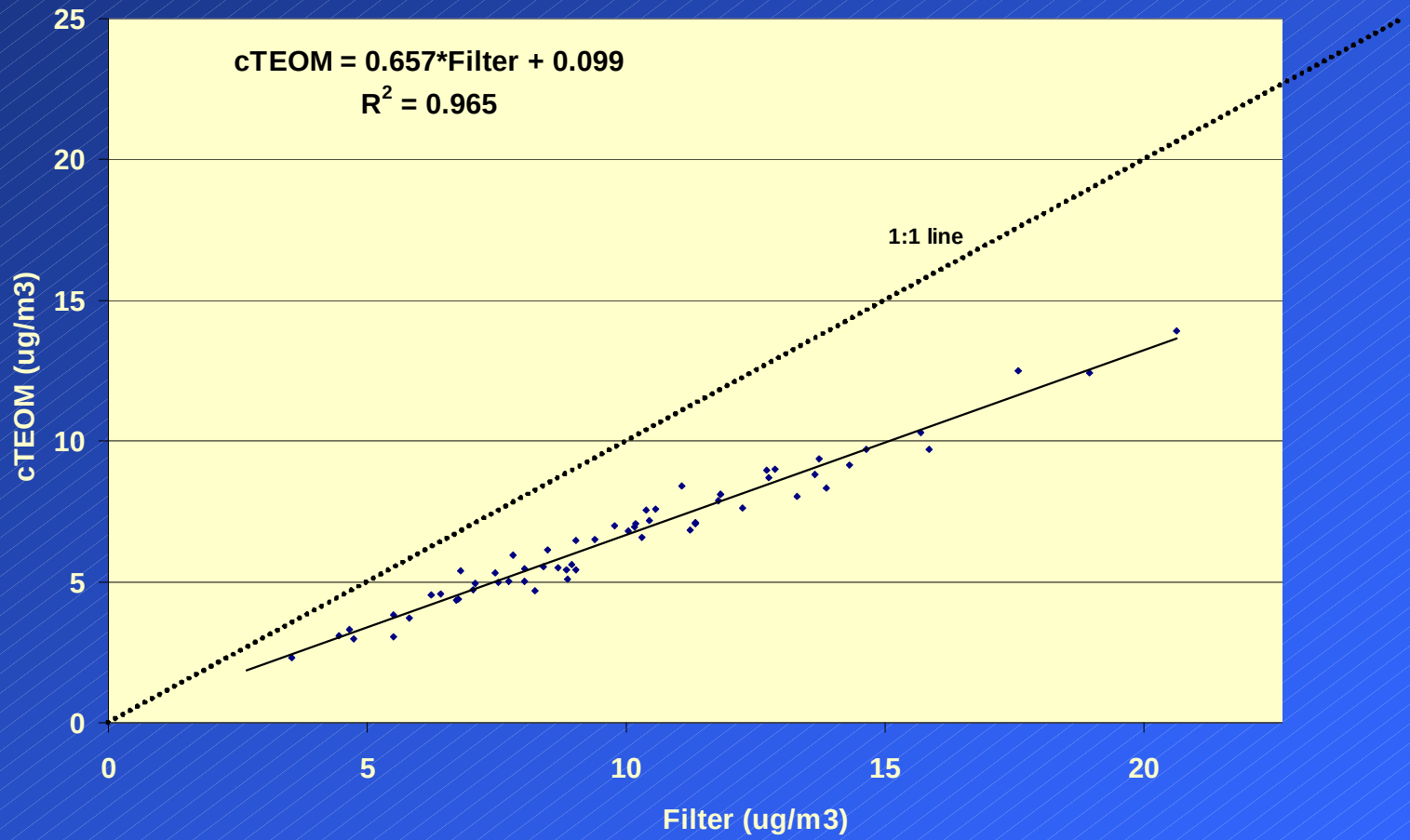


$PM_c = (cTEOM - f\ TEOM)/10.3$

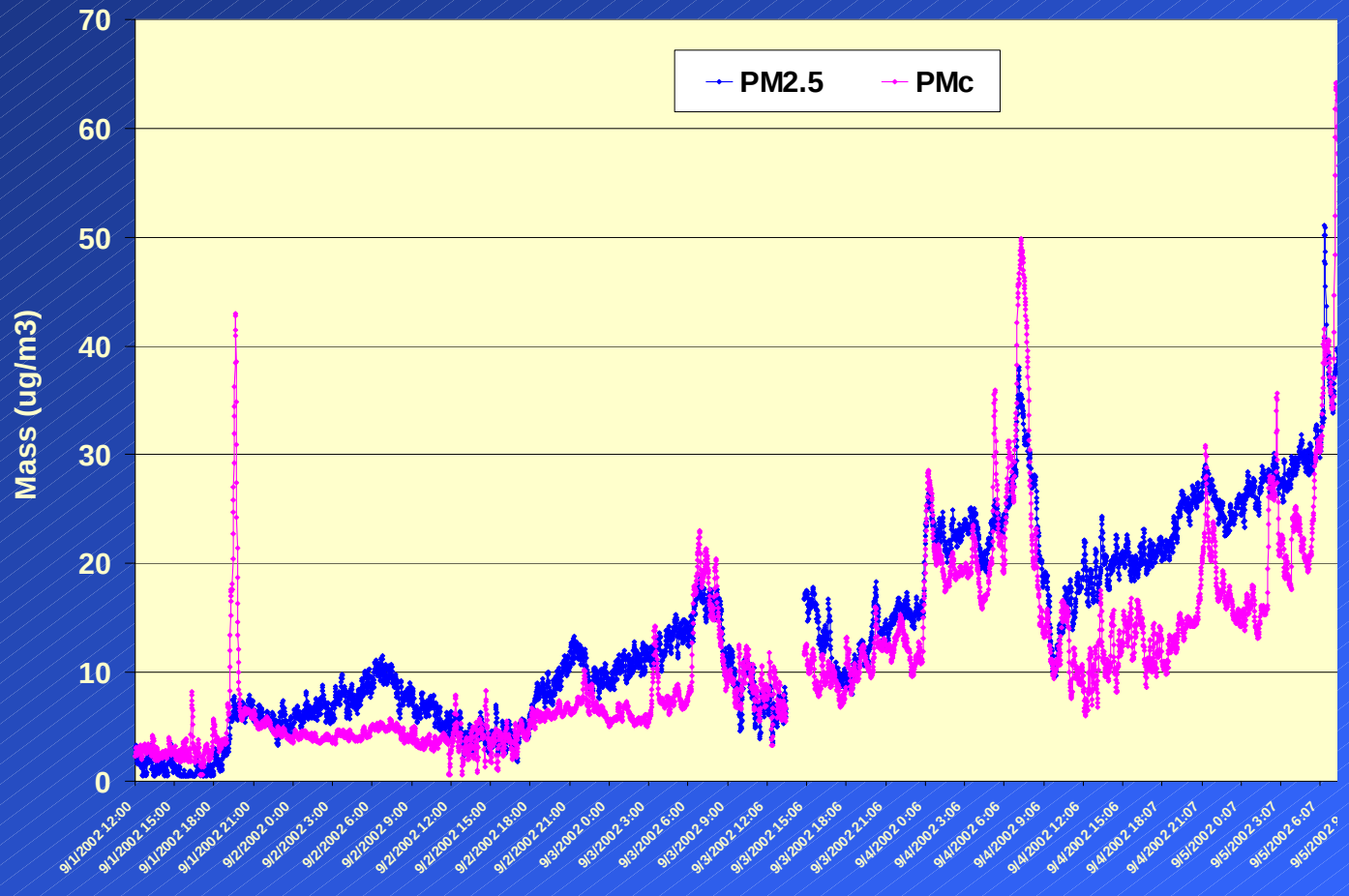
Time Series of PM_c Jefferson Street (5/7/02-7/9/02)



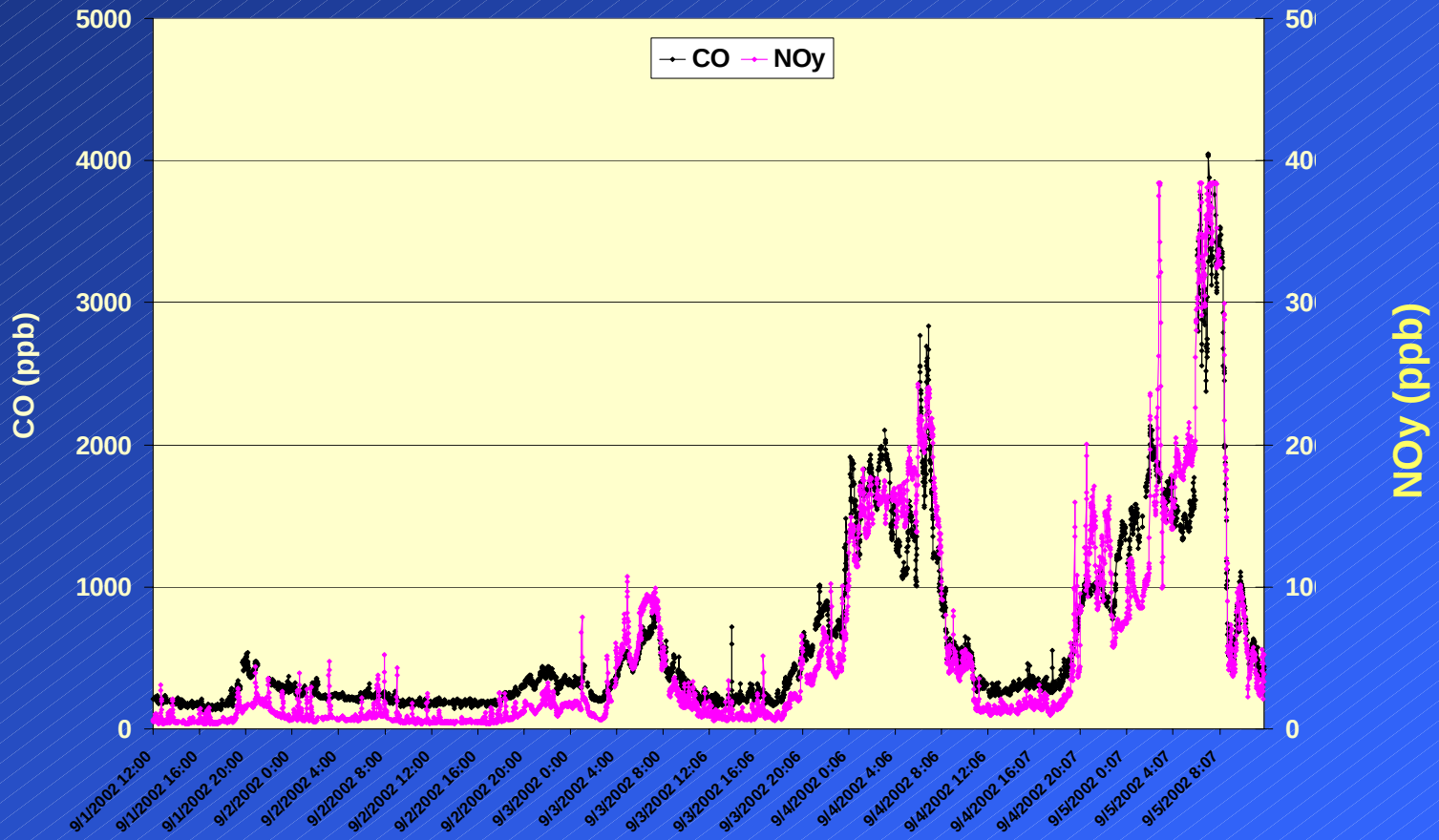
24-hour Average CoarseTEOM vs. Filter



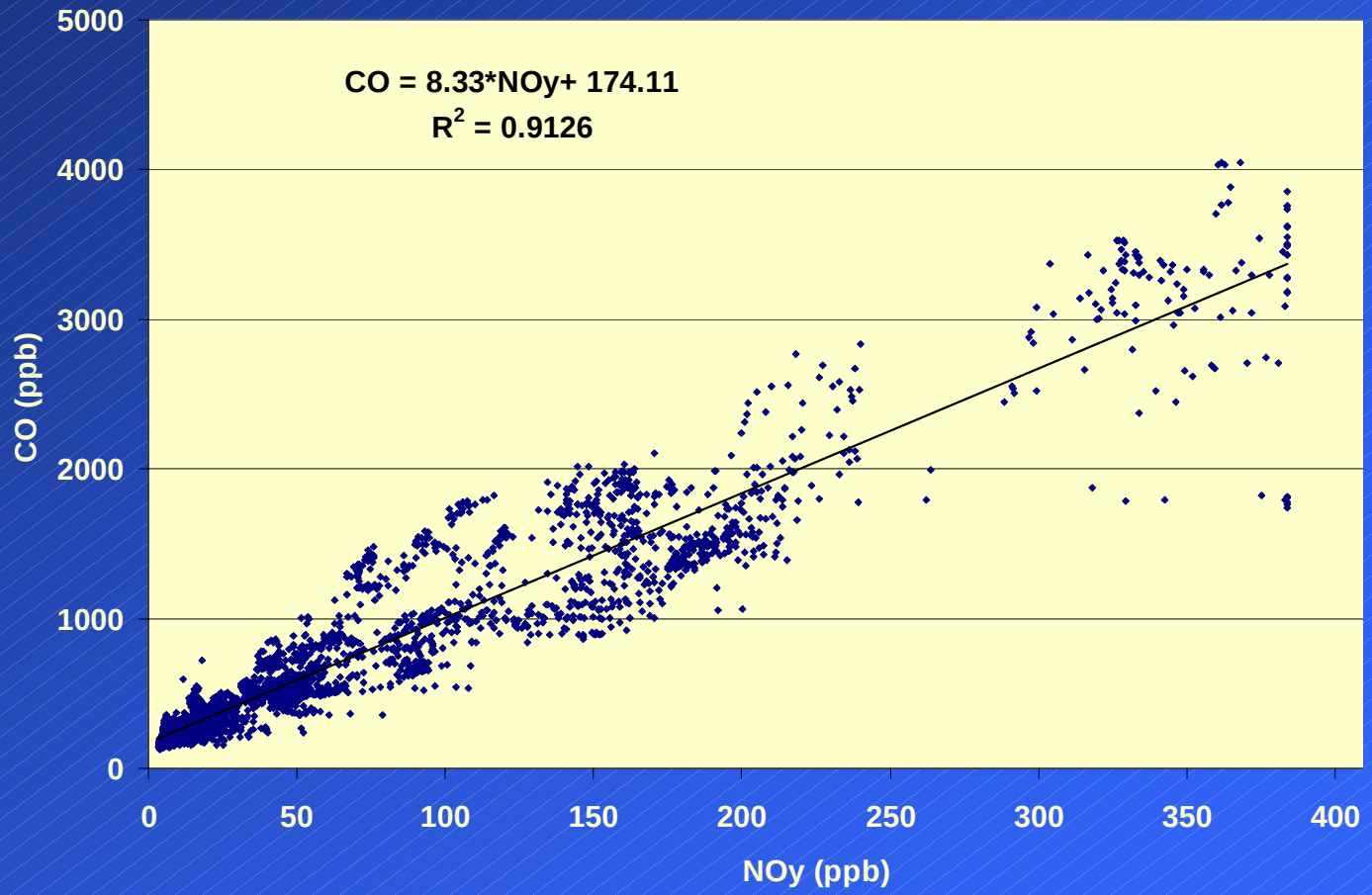
Continuous Mass Data
JST 9/1/01-9/5/01



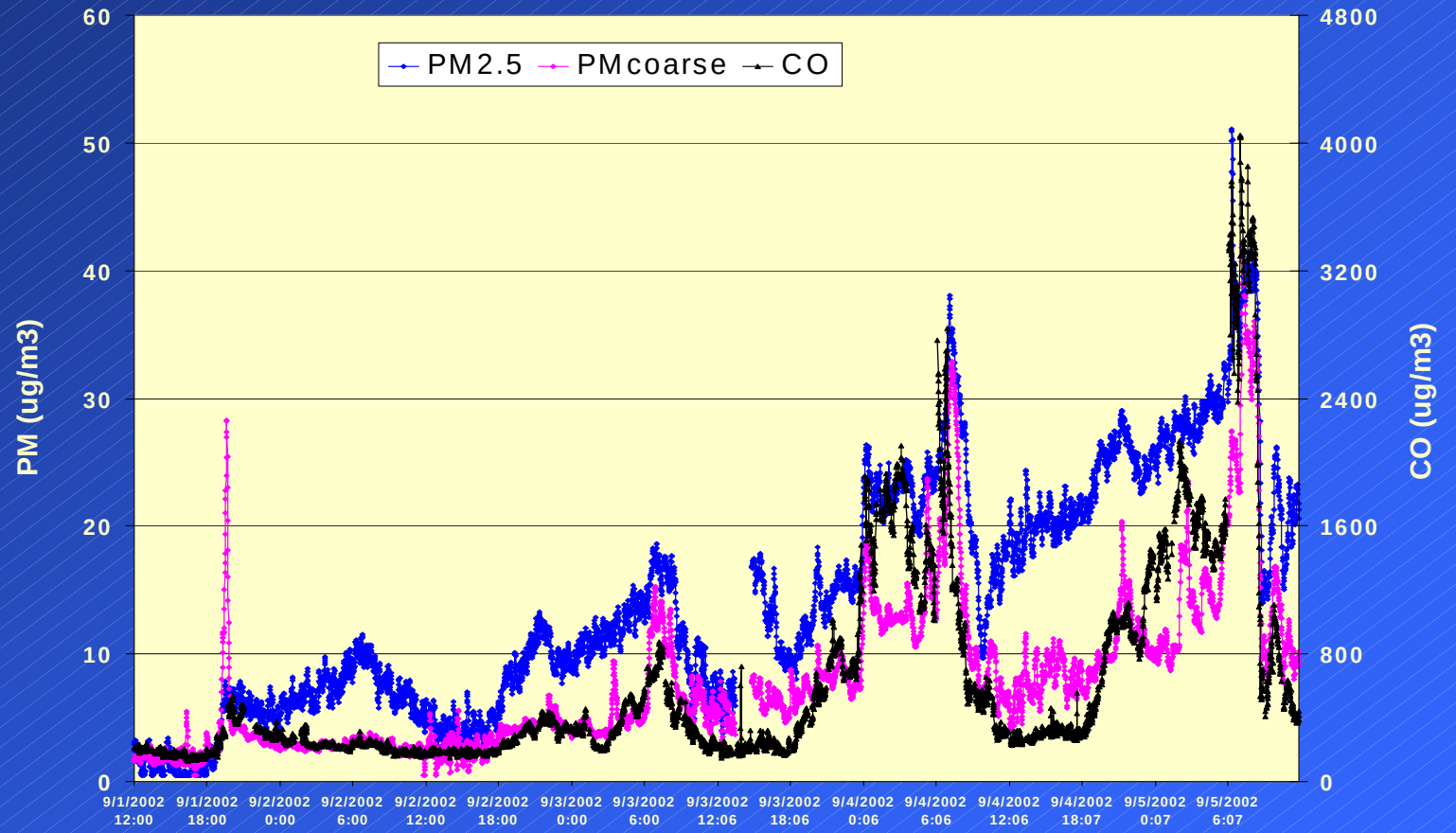
Continuous CO, NOy
JST 9/1/02-9/5/02



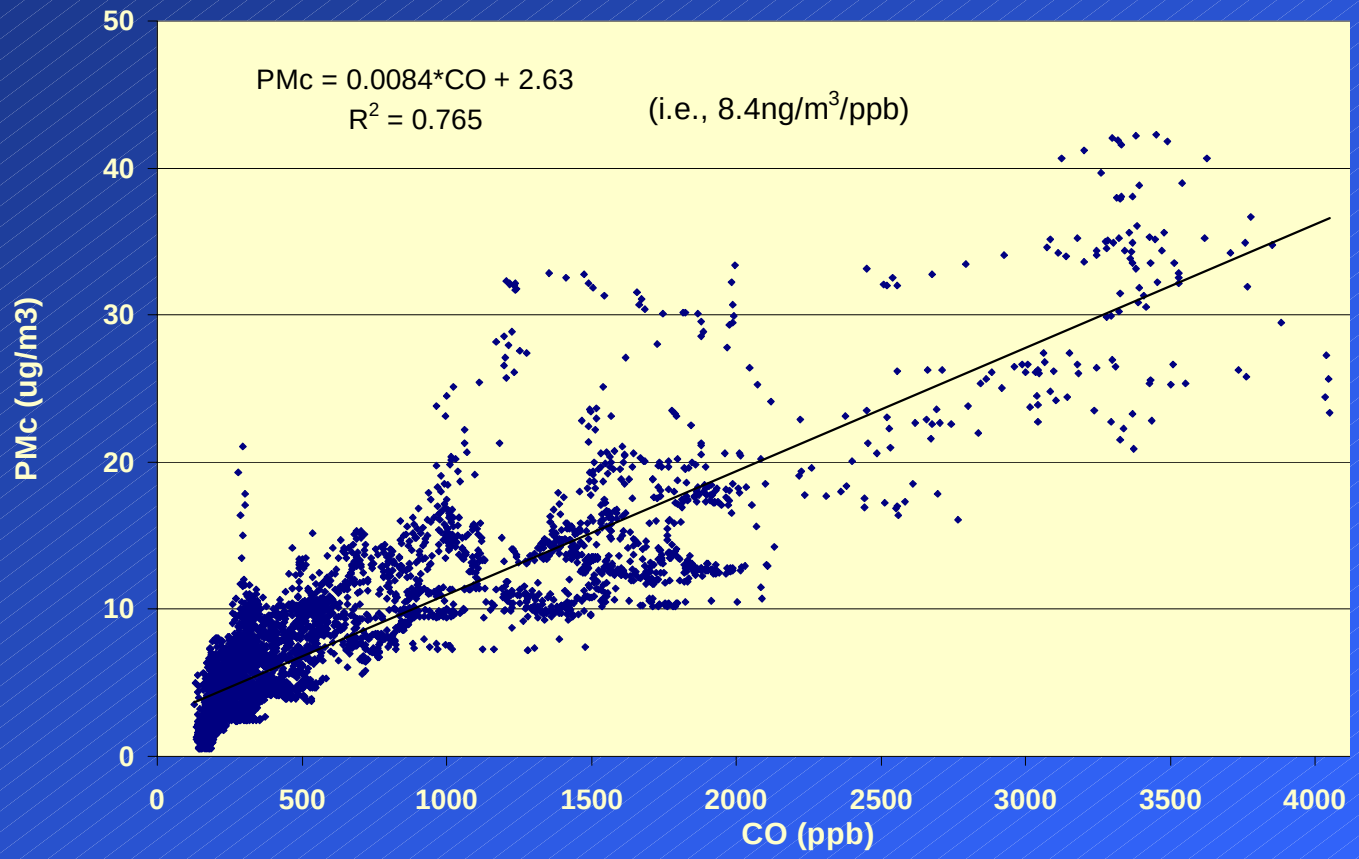
Scattergram of CO vs. NOy
JST 9/1/02-9/5/02



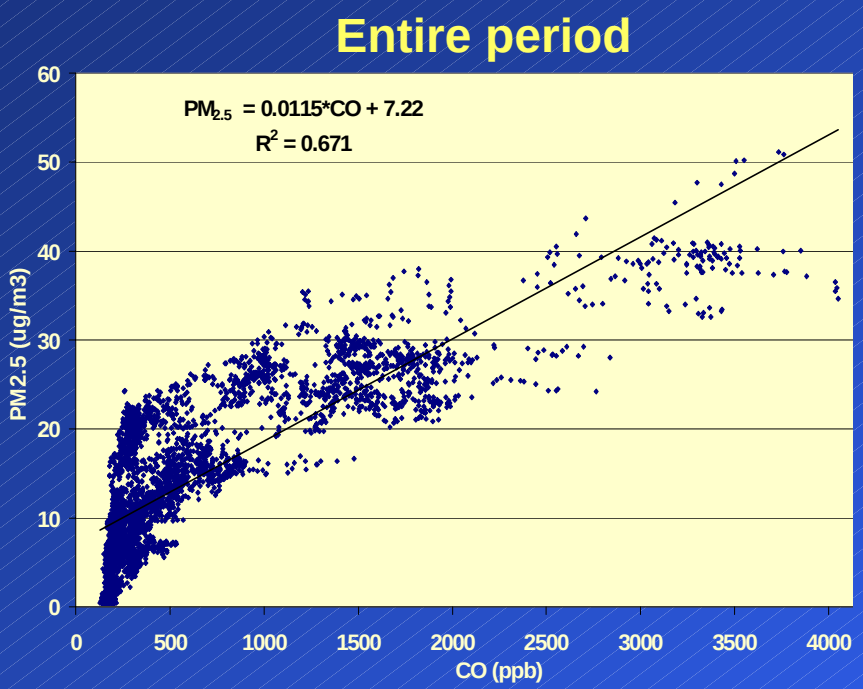
Time Series of PM and CO

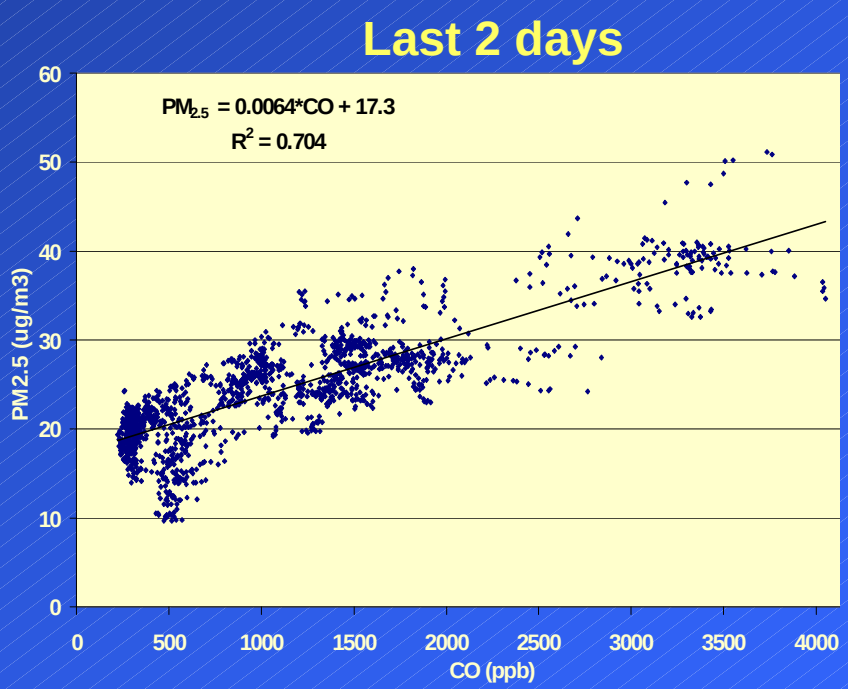


Scattergram of PMc vs. CO



Scattergram of $PM_{2.5}$ vs. CO





Conclusions

- A simple approach for continuous PM_c was tested using a modified dichot
- Comparison with 24-hour filter data showed good correlation, but a slope of only c. 0.65 and an intercept of 0.1
- Reasons for the discrepancy are under investigation
- Continuous PM data correlate fairly well with gaseous species (CO, NOy)
- Regression of mass data versus CO suggest emission factors on the order of 8.4 ng/m^3 of PMc and 6.4 $ng/m^{3\ of}$ $PM_{2.5}$ per ppb of CO for an early September event (high CO, NOy)