

Črni ogljik – globalni povzročitelj podnebnih sprememb

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Črni ogljik, absorpcija in segrevanje

- BC is a product of incomplete combustion:

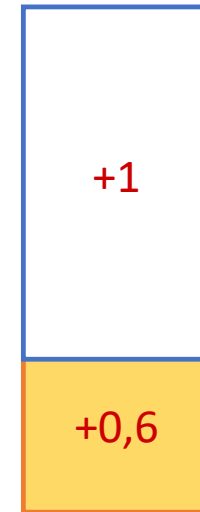


- BC direct radiative efficiency:

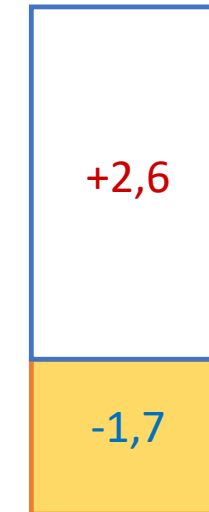
BC total:
 $+1,1 \pm 0,7 \text{ W/m}^2$

$+1,6 \text{ W/m}^2$

$+0,9 \text{ W/m}^2$



CO₂



BC (direct)

Ramanathan and Carmichael, 2008

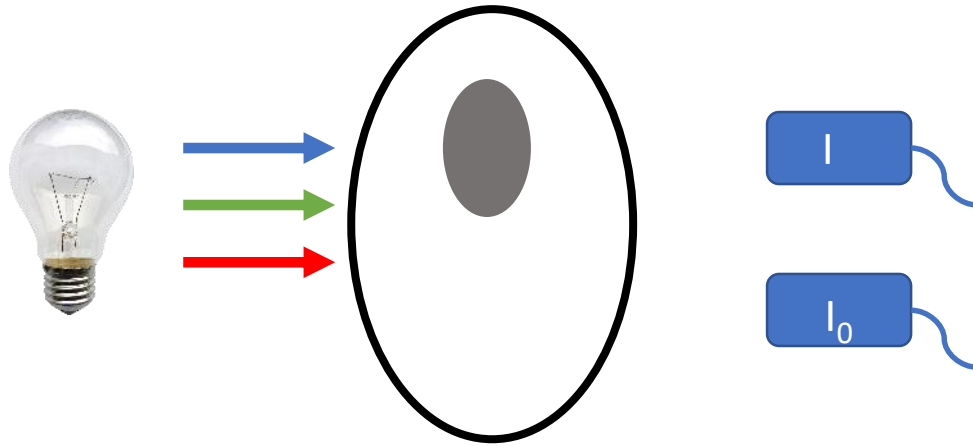


Letalo in vzorčevanje @ 10,000 ft in 200 km/h



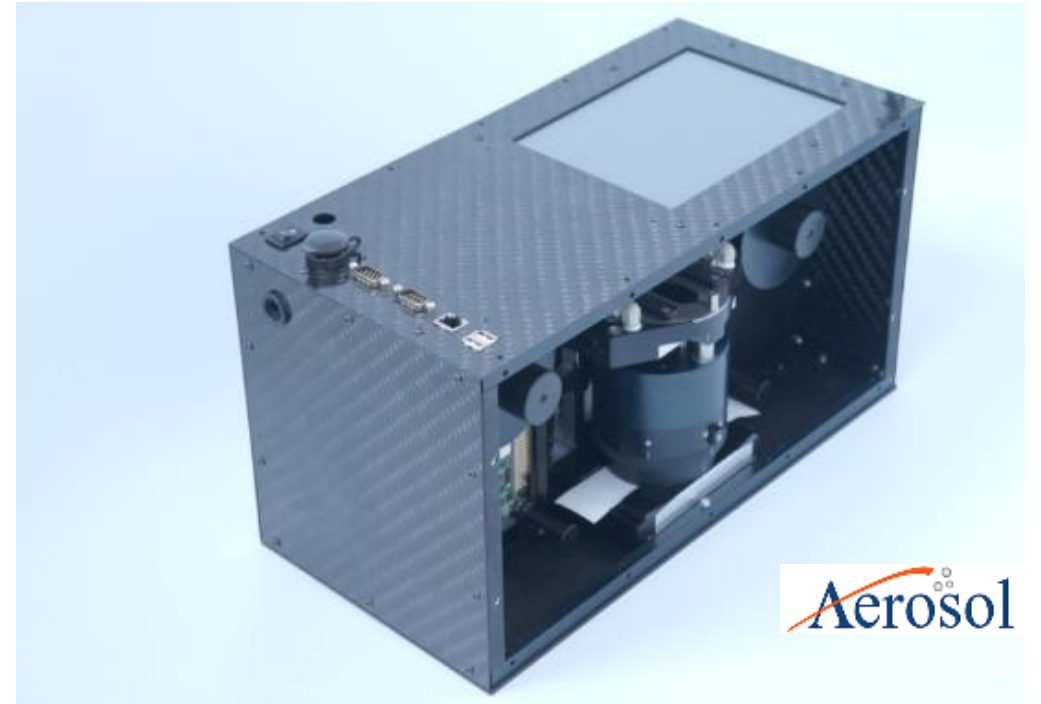
Letalo in vzorčevanje @ 10,000 ft in 200 km/h

Filtrski fotometri

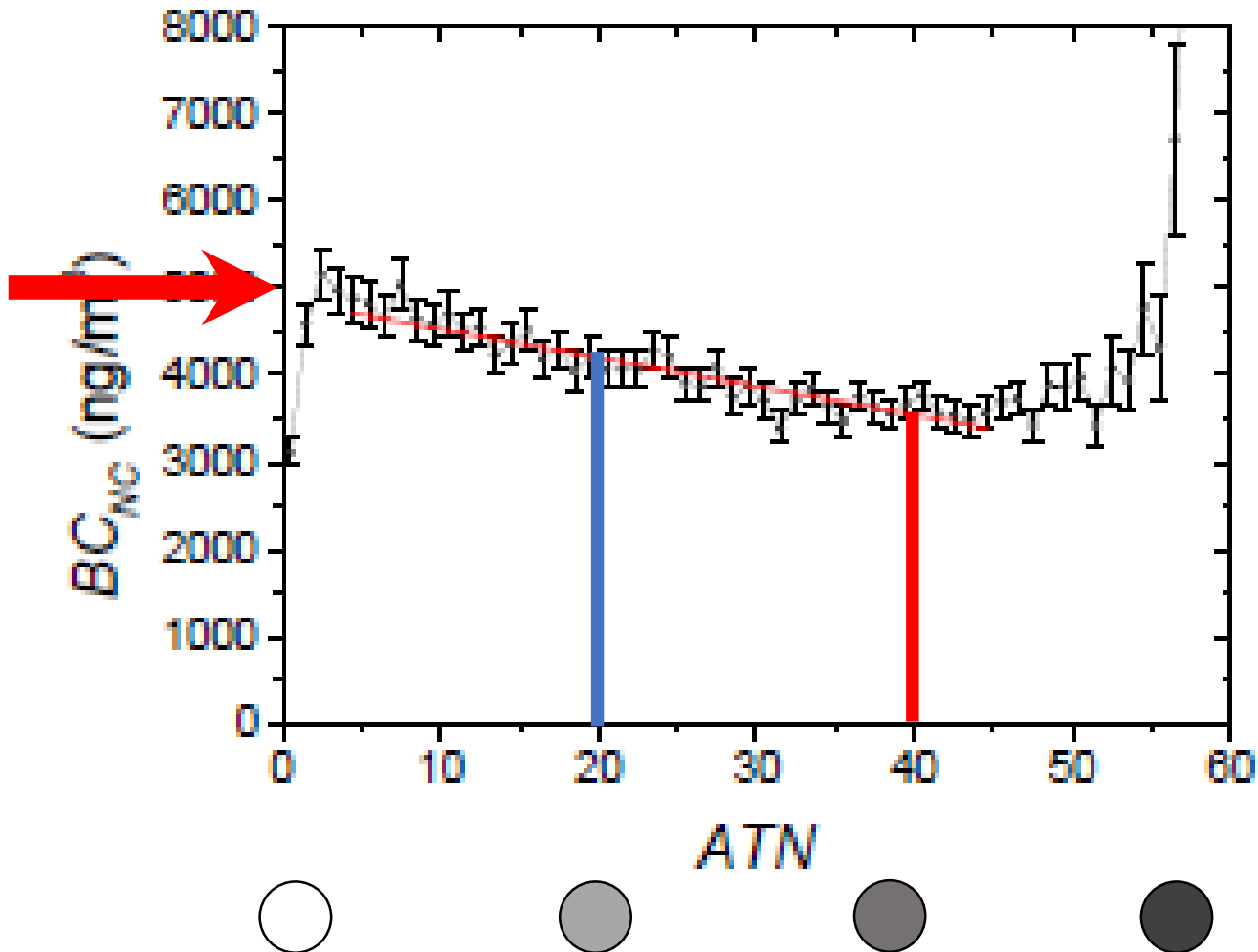


$$ATN = \ln \frac{I}{I_0}$$

$$b_{abs} \sim C \frac{\Delta ATN}{\Delta t}$$



Filtrski fotometri - nelinearnosti

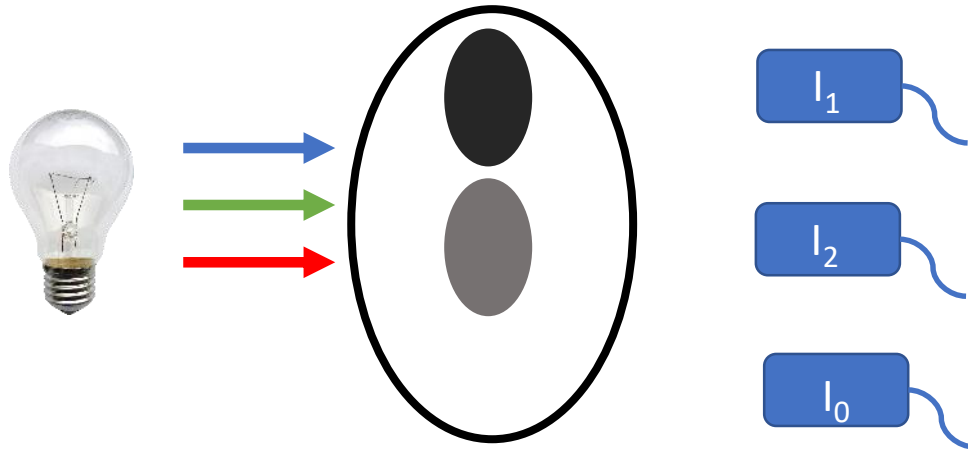


$$ATN_1 = \ln \frac{I_1}{I_0} \quad ATN_2 = \ln \frac{I_2}{I_0}$$

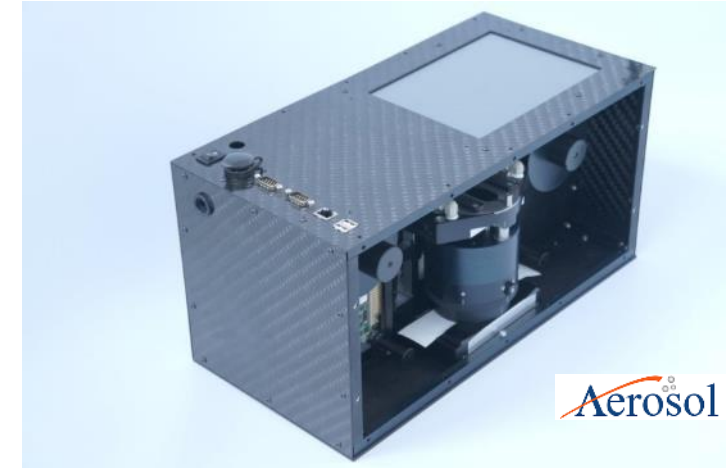
$$b_{abs} \sim C \frac{\Delta ATN}{\Delta t} f(ATN_1, ATN_2)$$

Drinovec et al., 2015

Filtrski fotometri



- dva vzorca
- različna pretoka zraka
- različne hitrost odlaganja



$$ATN_1 = \ln \frac{I_1}{I_0} \quad ATN_2 = \ln \frac{I_2}{I_0}$$

$$b_{abs} \sim C \frac{\Delta ATN}{\Delta t} f(ATN_1, ATN_2)$$

Drinovec et al., 2015

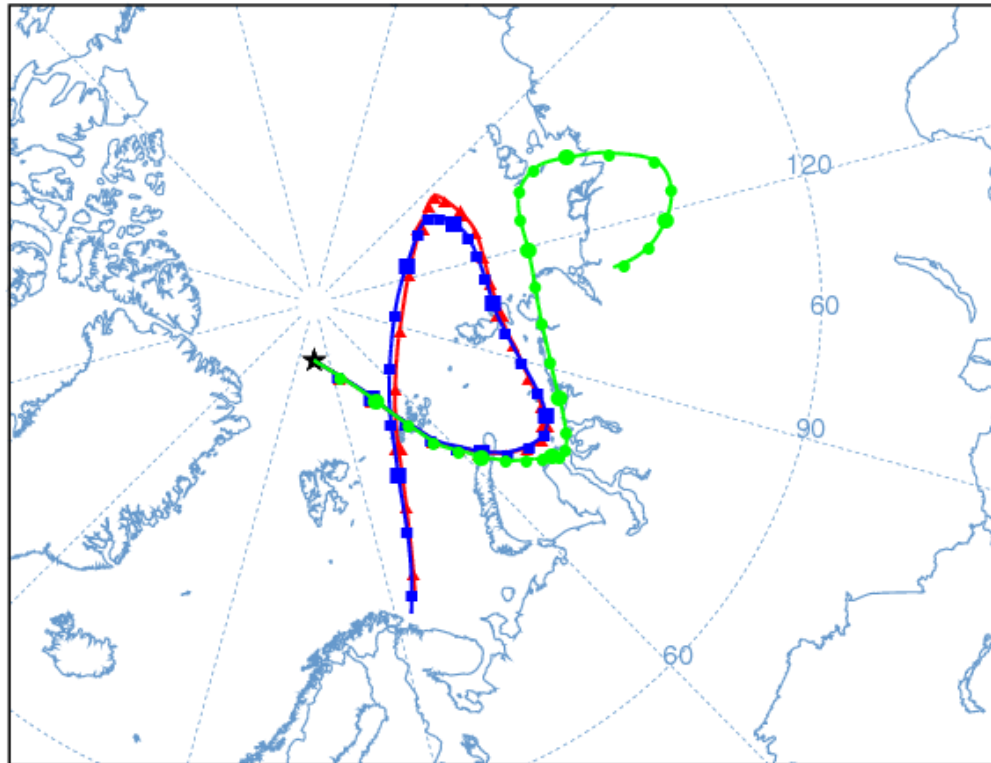
Svalbard – severni tečaj

NOAA HYSPLIT MODEL

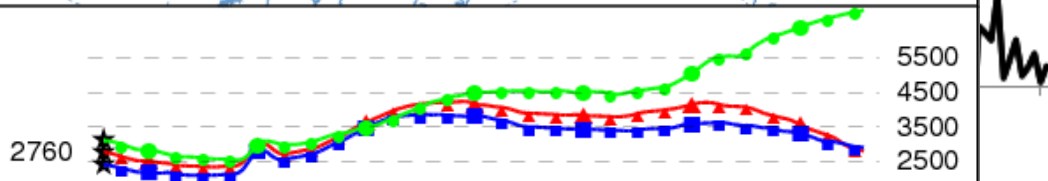
Backward trajectories ending at 1000 UTC 30 Apr 13

GDAS Meteorological Data

Source ★ at 86.54 N 15.37 E



Meters AGL

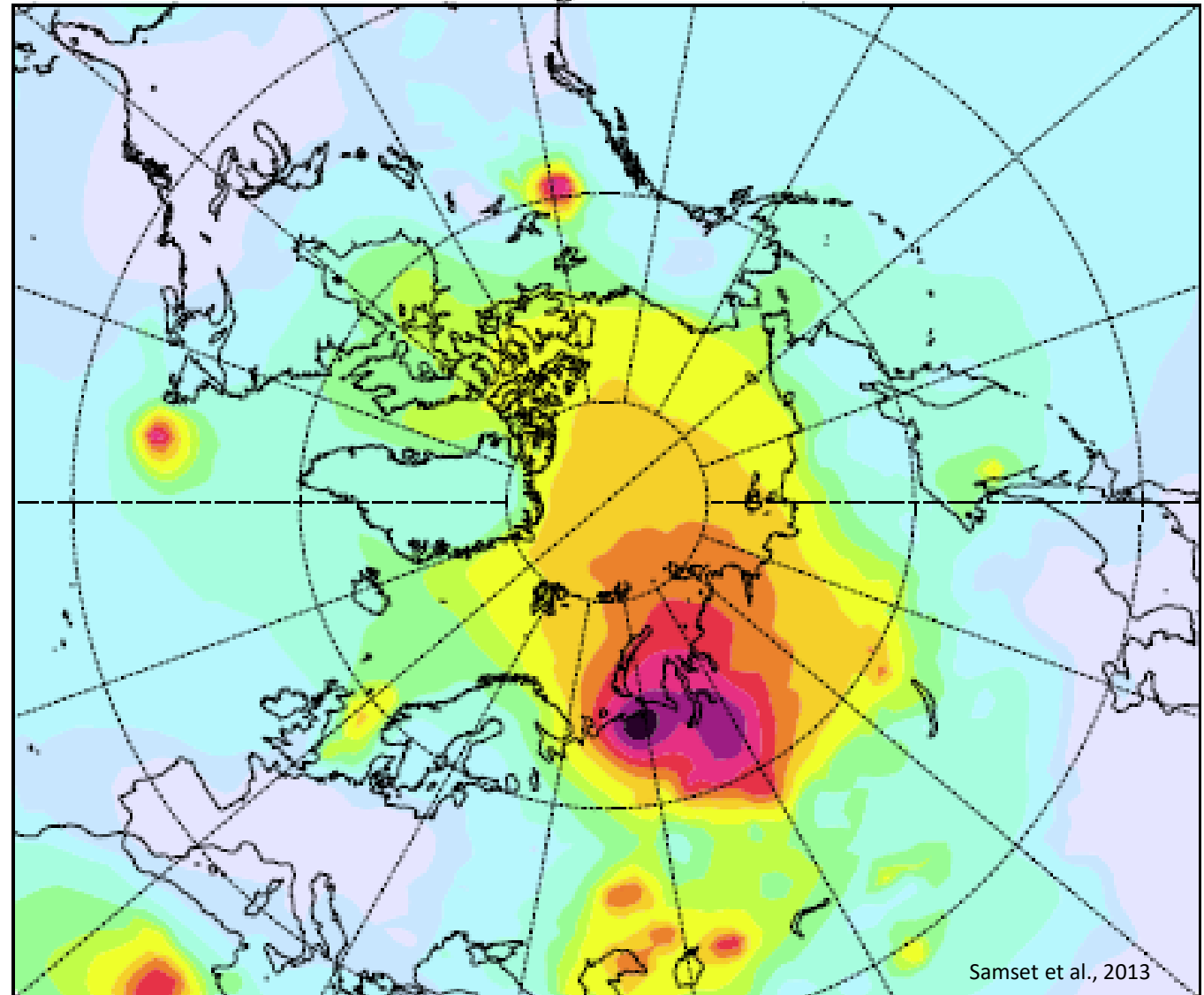


0600 1812 0600 1812 0600 1812 0600 1812 0600 1812 0600 1812 0600 1812
 04/30 04/29 04/28 04/27 04/26 04/25 04/24

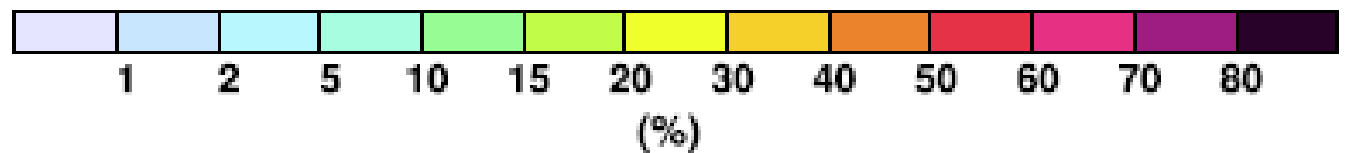
tim

This is not a NOAA product. It was produced by a web user.
 Job ID: 308283 Job Start: Sun May 5 20:24:38 UTC 2013
 Source 1 lat.: 86.53861111 lon.: 15.36555556 hgts: 2760, 2400, 3100 m AMSL
 Trajectory Direction: Backward Duration: 168 hrs
 Vertical Motion Calculation Method: Model Vertical Velocity
 Meteorology: 0000Z 29 Apr 2013 - GDAS1

Flaring emissions



Samset et al., 2013





Malezija

BC @ 10.000 ft

reka Kongo



Polet 2012

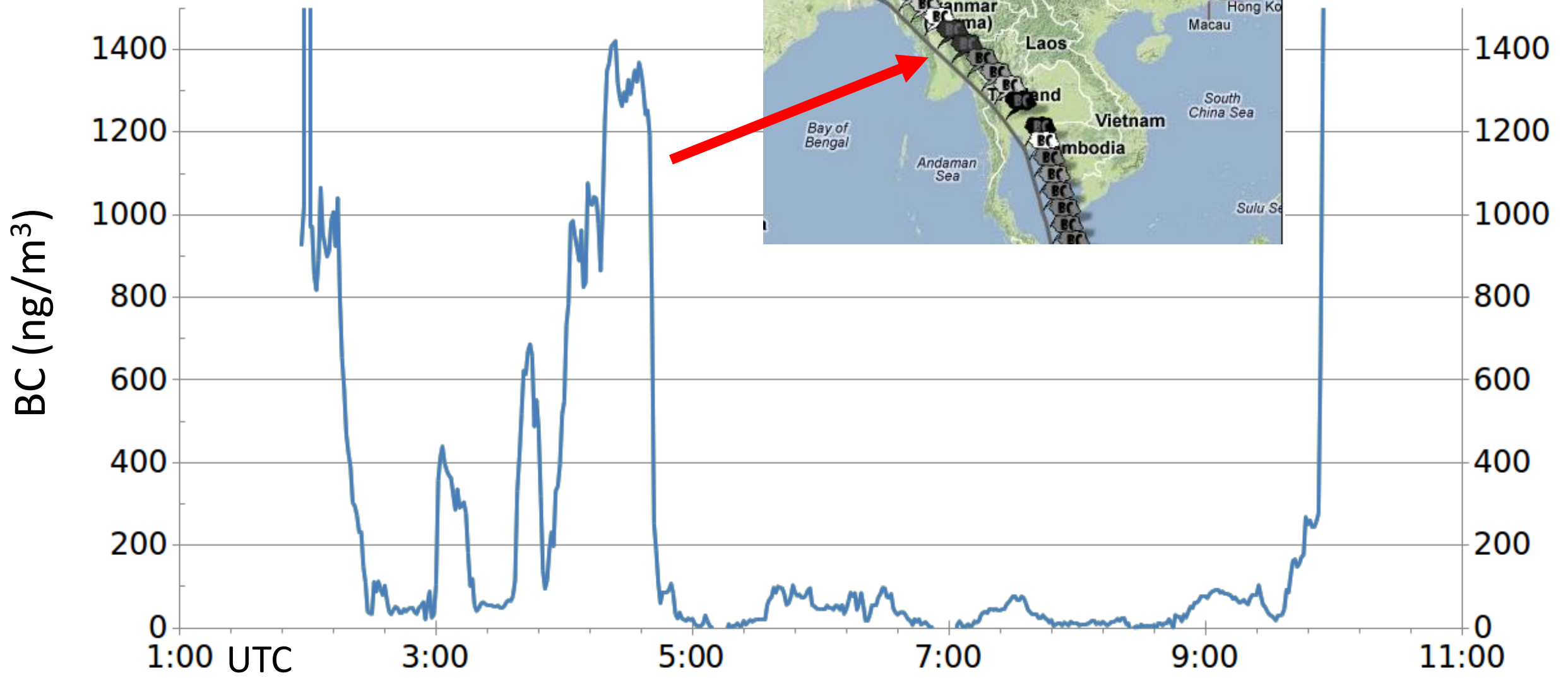


Polet 2018



Tajska

Indija

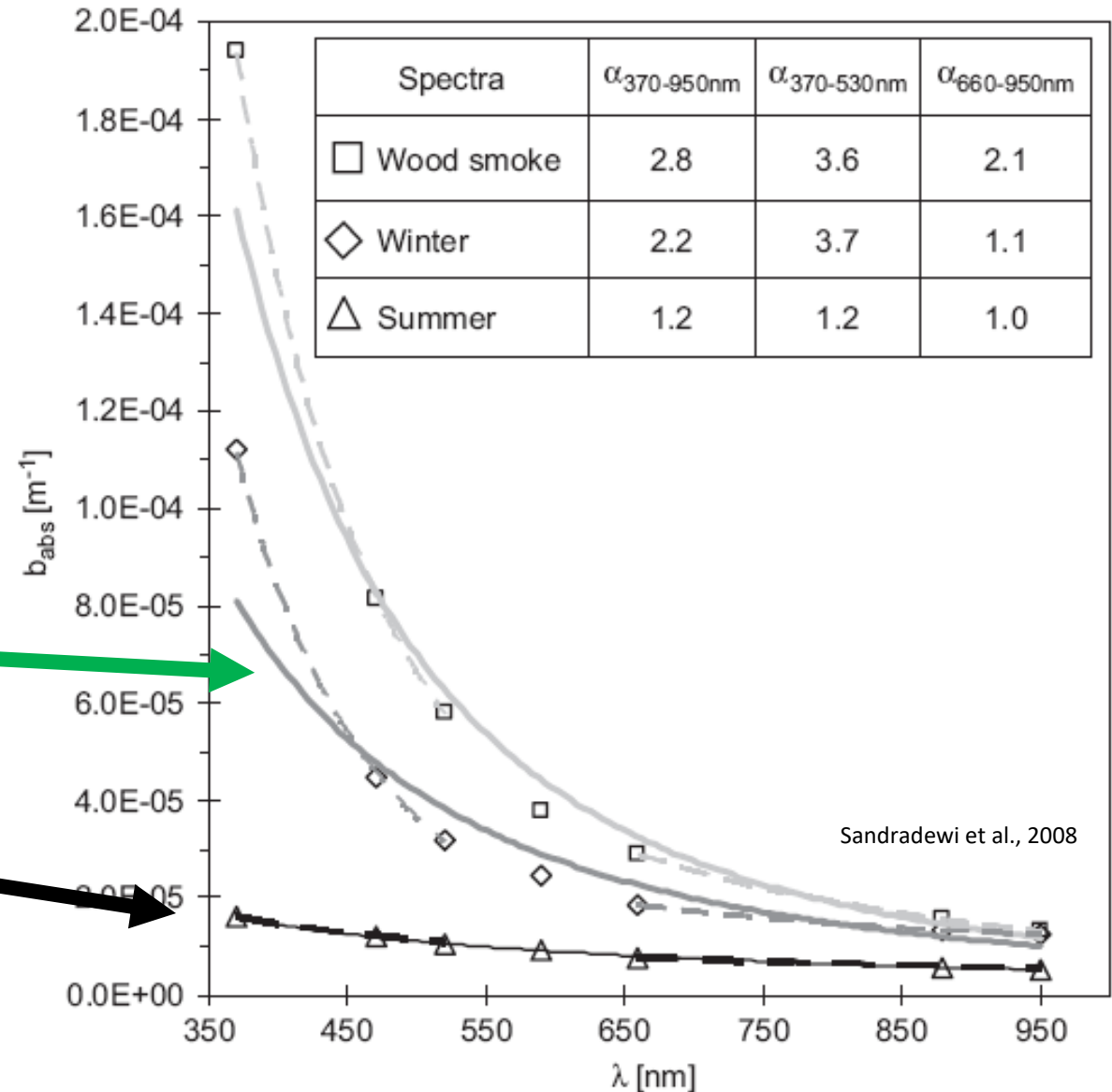


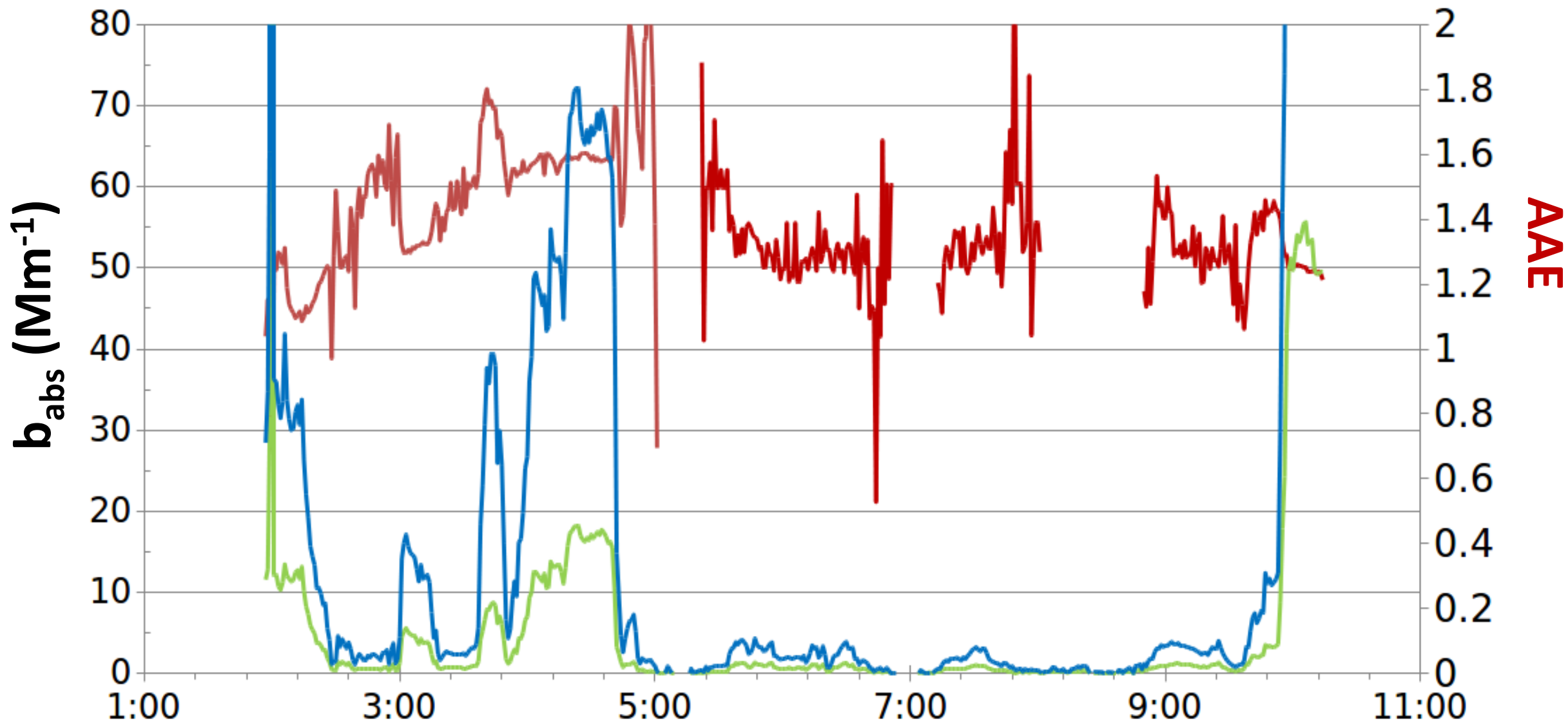
Viri: odvisnost od valovne dolžine

- Absorption Angstrom Exponent AAE
- Source specific

biomass AAE ~ 2

fossil fuel AAE = 1





Sklep

- **absorpcija aerosolov** je odvisna od **virov, meteorologije**
- **regionalni** transport, mešanje atmosfere
- meritve: **AAE ≥ 1.3** v različnih okoljih
- **modeli**, ki predvidevajo **DRE \sim BC**, **podcenjujejo segrevanje**

Hvala!

Vprašanja?

grisa.mocnik@ijs.si



<http://www.worldgreenflight.com/>