Effect of different emission sources on the distribution of black carbon aerosols in South Asia

Rajesh Kumar\(^1\), M. C. Barth\(^1\), V. S. Nair\(^2\), G. G. Pfister\(^1\), S. S. Babu\(^2\) and K. K. Moorthy\(^2\)

\(^1\)National Center for Atmospheric Research, Boulder, USA
\(^2\)Space Physical Laboratory, VSSC, Thiruvananthapuram, India
The WRF-CHEM Simulation Design

- **Period**: March – May 2006
- **Anthropogenic emissions**: MACCity + SEAC$^4$RS
- **Biomass burning emissions**: FINN V1
- **7 BC tracers are included**
- **Source tracers** – BC-ANT, BC-BB and BC-BDY
- **Sector tracers** – BC-RES, BC-TRA, BC-IND, BC-POW
WRF-Chem captures observed variations in BC during ICARB.

Anthropogenic emissions account for most of the BC loading.
Anthropogenic emissions are main sources of BC in South Asia.

- ICARB was fairly well representative of a larger spatial scale and pre-monsoon season.
- Biomass burning makes a significant contribution in Burma and BoB.
- Arabian Sea is influenced more by the background sources.
Residential and industrial sectors are main contributors to BC loadings.

![Maps showing anthropogenic BC (ng m⁻³) and sector contributions](image-url)
Summary

- WRF-Chem model captures the observed variations in BC mass concentrations in the Bay of Bengal and the Arabian Sea.
- Anthropogenic emissions are main sources of BC in India while biomass burning dominates in Burma.
- Residential and Industrial sectors are the main contributors to anthropogenic BC.

Thanks for Your Attention !!