MOPITT IN LANCE

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THE MOPITT SIPS TEAM

THE MOPITT SCIENCE TEAM
OVERVIEW

- MOPITT is an instrument on Terra.
- MOPITT measures vertical profiles of tropospheric CO.
- CO is a reactive gas with a lifetime of weeks to a few months.
- Sources and plumes of CO are readily visible in MOPITT data.
- Standard products depend on MERRA 2 reanalysis, which introduces a lag of approximately six weeks.

Credits: NASA Earth Observatory map by Joshua Stevens and Jesse Allen, using data from the MOPITT Teams at the National Center for Atmospheric Research and the University of Toronto.
CURRENT APPLICATIONS

- Near Real Time (NRT) products are currently being produced and placed on our ftp site.
- They are downloaded by ECMWF and assimilated into their atmospheric chemistry model (Copernicus Atmospheric Monitoring Service)
  - [http://www.ecmwf.int/en/about/what-we-do/copernicus/copernicus-atmosphere-monitoring-service](http://www.ecmwf.int/en/about/what-we-do/copernicus/copernicus-atmosphere-monitoring-service)
- MOPITT NRT products have been used in many field experiments to plan flights into pollution plumes.
  - Most recently KORUS-AQ in July of 2016, studying air pollution over Korea.
• MOPITT has begun receiving Session Contact Level 0 data.
• The SIPS can process this data with simulated Attitude and Ephemeris.
• NCAR System Admins have studied the LANCE protocol documentation and are undaunted.
• MOPITT SIPS already has a redundant backup processing computer.
GRANULE SIZE

• Will users tolerate irregularly sized granules?
• Would users prefer more regular deliveries?
• Can their systems tolerate redelivery of the same data?
• How do other Elements handle this?
• Possible response – publish 15 minute granules?

MOPITT Session Contact Granules
2016 Aug 19

Granule Number

Hour of the Day
QUALITY CONTROL

• If MOPITT is accepted as a LANCE Element, there will be some moderate compromises in data quality due to:
  • Cloud detection will not have the benefit of MODIS
  • Simulated orbit characteristics
  • Forecasted met data

• Automatic QA – number of pixels processed is a good indication of quality. If there is a problem, retrievals do not converge.
  • If the granule fails automatic QA, the SIPS engineer will be alerted by email.
  • The granule will not be published.
  • Troubleshooting will ensue.

• Periodic Scientific Review – The LANCE granules will be compared to the standard products to quantify the relative error of the NRT processing.
PROPOSAL

• MOPITT SIPS will be configured to be a LANCE Element.
• MOPITT will provide CO products in NRT.
• Development during the fall of 2016.
• Operational in early 2017.
• Labor for developing the LANCE Element is covered by a management reserve in the MOPITT SIPS budget.
• **No additional cost to NASA.**