Now for Something Completely Different

Somewhat

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The Talk

- Some history
- Other ideas
- Future applications
Thoughts

- Balloons used to test new instruments
- Used to train HQP (who then do aircraft and space instrument development)
- Characterize measurements, instruments and develop retrieval strategies
History

• Proving the performance of instruments
  – Lyman alpha compared to frostpoint hygrometer
  – TDL performance compared to whole air sampling (WAS) and GC/MS
  – Ozone DIAL compared to ozonesondes
  – Infrared spectrometry compared to WAS
  – In situ particle measurements compared to optical retrievals
Future Applications?

• Use a combination of instruments – primarily LIDARs - to define the state of the atmosphere under a balloon to diagnose the performance of backscatter instruments
  – There are still problems handling clouds
  – Effective cloud path enhancement issues
  – Surface albedo
  – Absorbing aerosol
  – Snow and ice surfaces
  – Use of polarization
OCO

- A re-flight of the lost Orbiting Carbon Observatory is planned by NASA and JPL
- Experiment is based on the idea that column amounts of both $O_2$ and $CO_2$ can be measured with a precision on the order of 0.3% even though both measurements have an absolute accuracy of ~2%
- Is this true? The argument is that there are systematic problems in line parameters and that this can be calibrated out
Is it so?

- Temperature / profile effects
- Aerosol interference
- Water absorption

It would be prudent to have diagnostic information about the performance of the technique
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Thank You