

Mars Odyssey Accelerometer Results

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Background

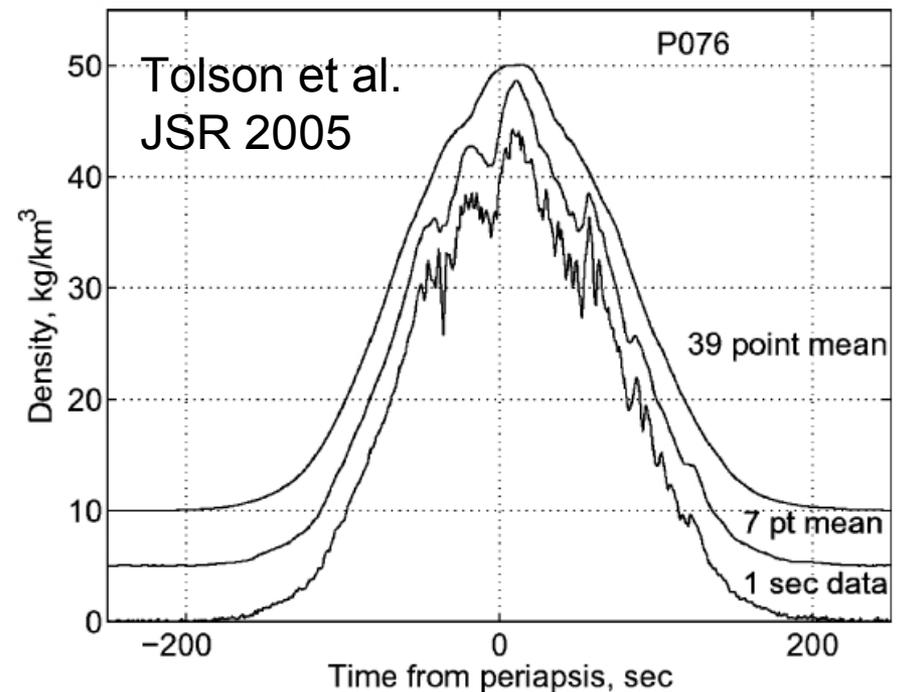
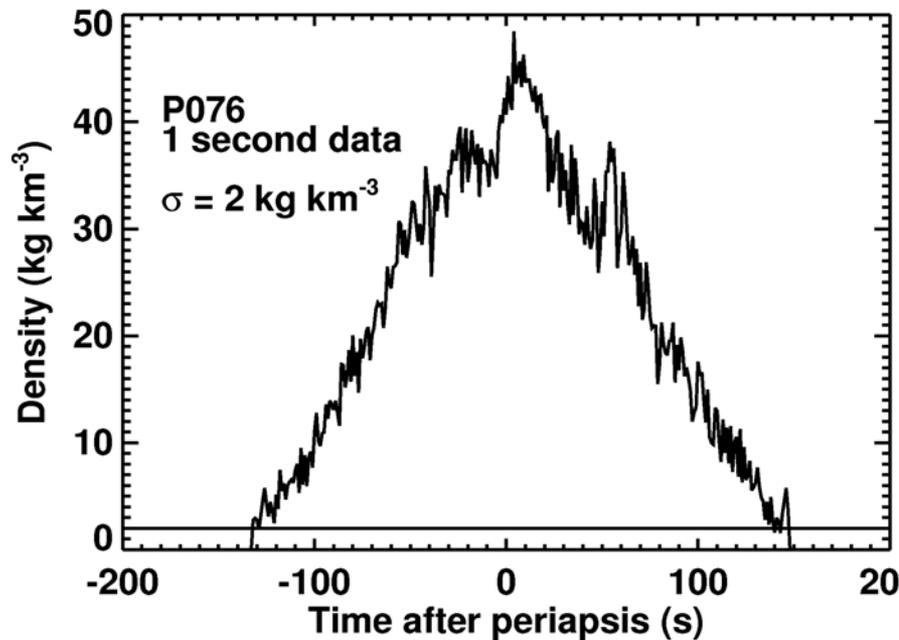
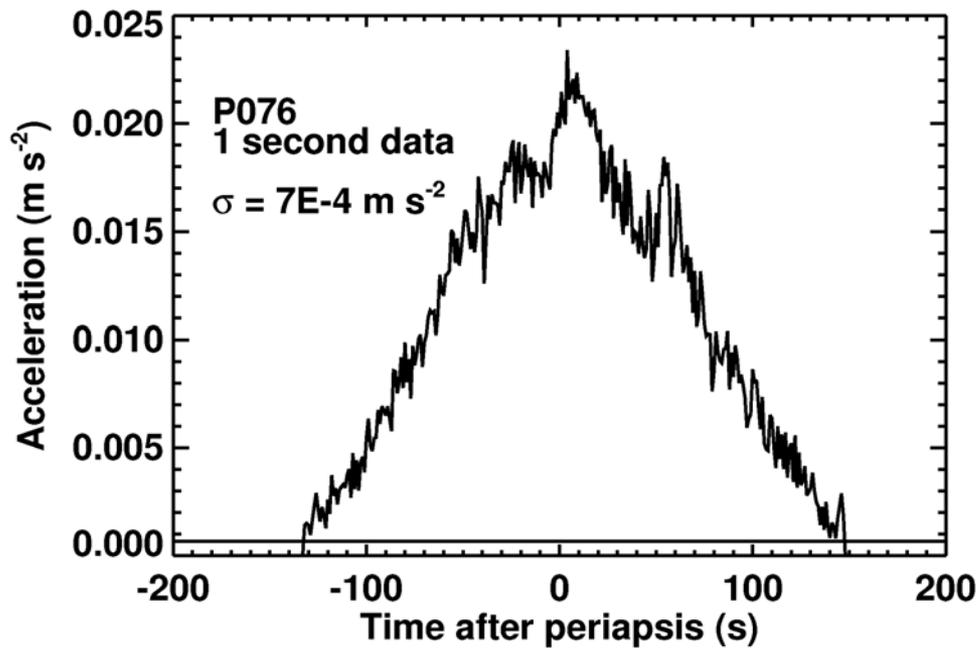
- Odyssey aerobraked from October 2001 to January 2002
- “A reduced accelerometer dataset is being archived with the PDS. At the present time, it is mostly undocumented and has not undergone a peer review” – PDS website, October 2006
- Odyssey Participating Scientist Program selected “Analysis of Accelerometer Data from Aerobraking” (PI: Mendillo) proposal

Objectives

- Obtain atmospheric densities from measured accelerations
- Deliver raw data, data products (density profiles and densities at fixed altitude), and documentation to PDS
- Do some science

Acceleration -> Density

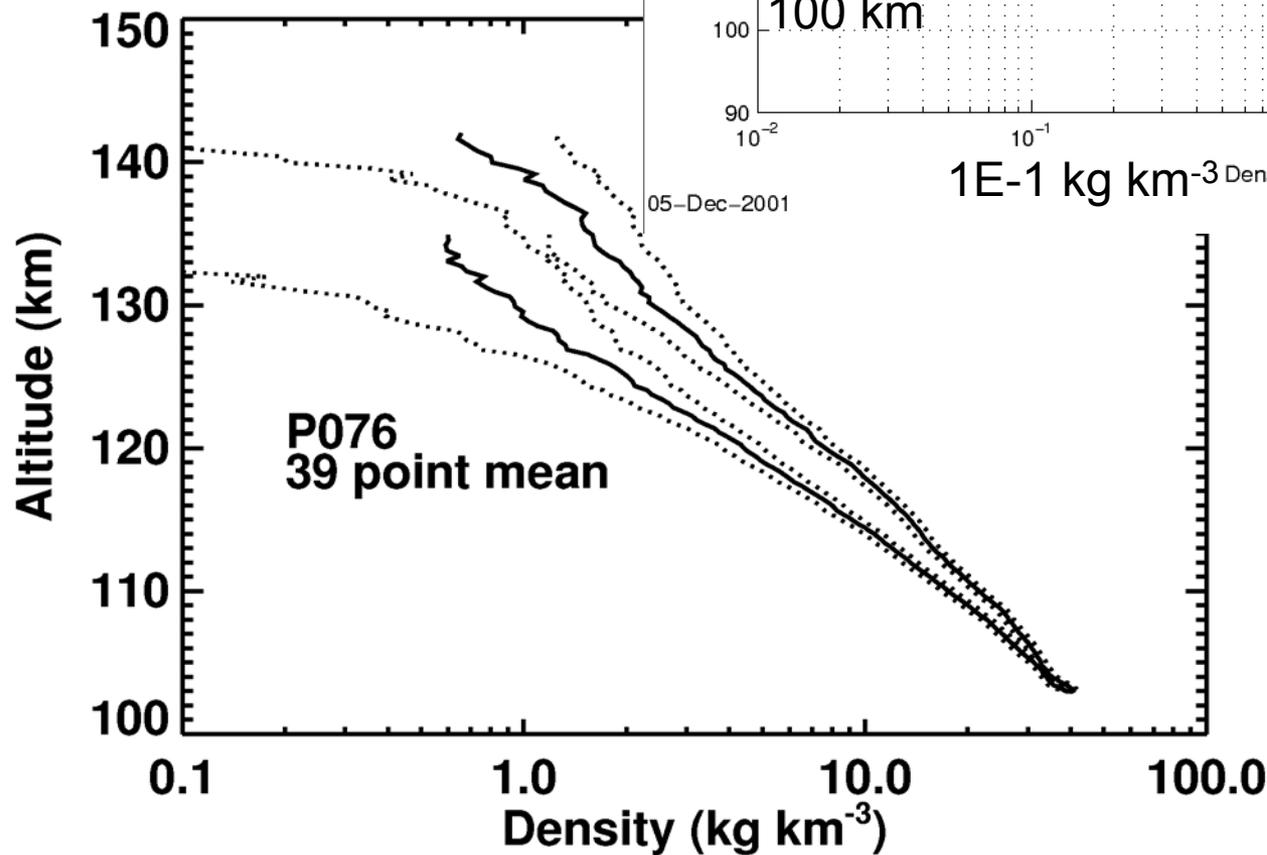
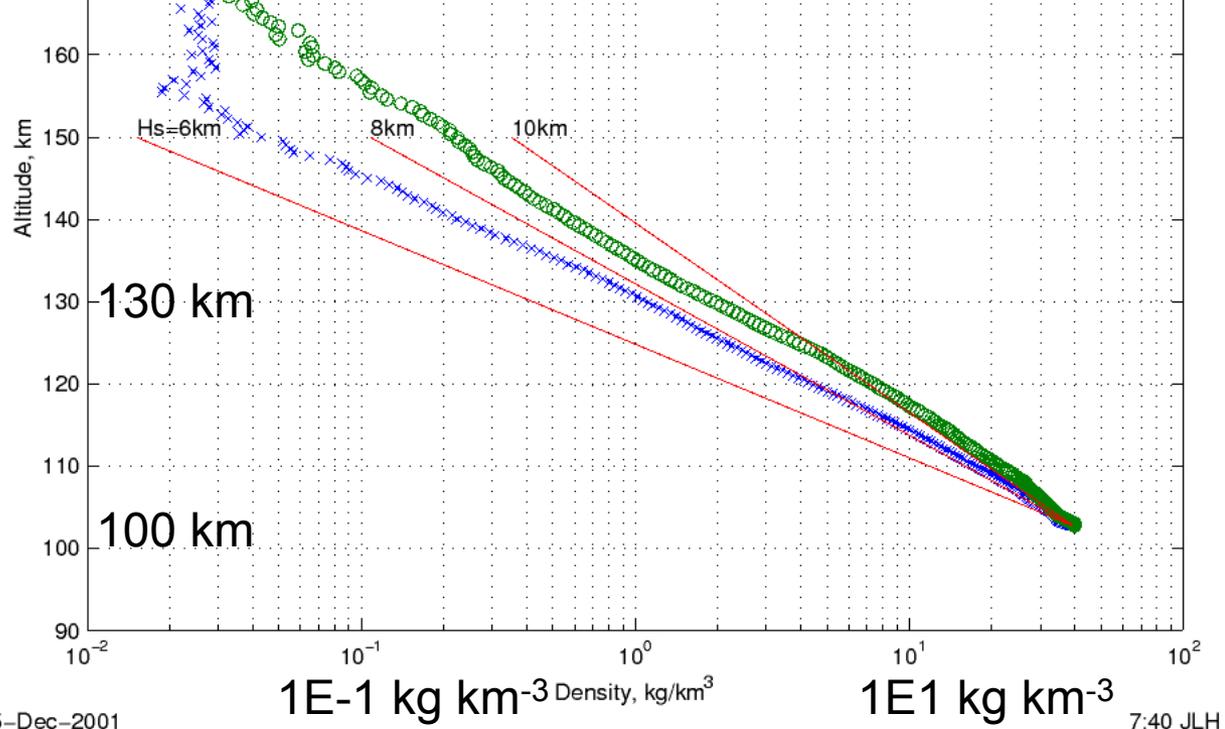
- $ma = \rho C A v^2 / 2$



Validation

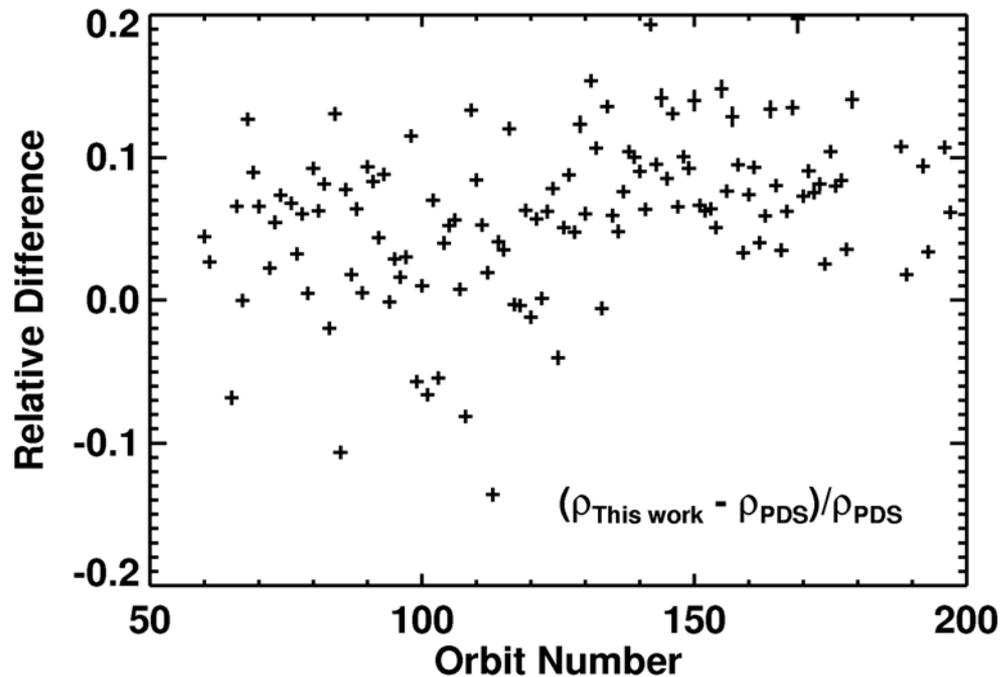
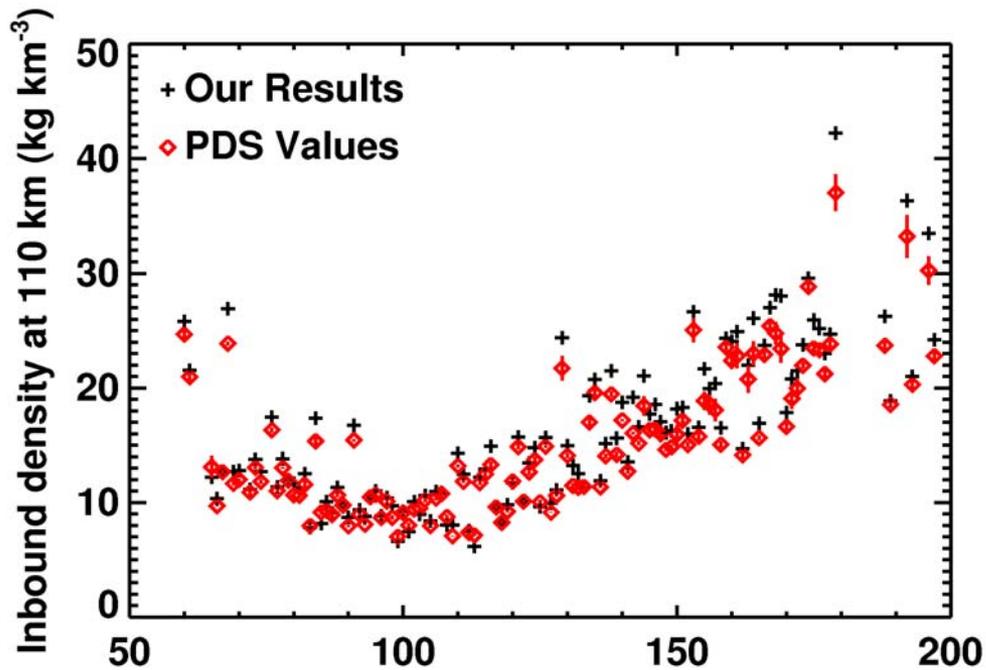
- Engineering papers
- Quick-Look Reports produced during aerobraking
- 110 and 120 km densities and scale heights at PDS

Quick Look Report for orbit P076 --->



05-Dec-2001

7:40 JLH



Results agree well with those that have been archived at the PDS

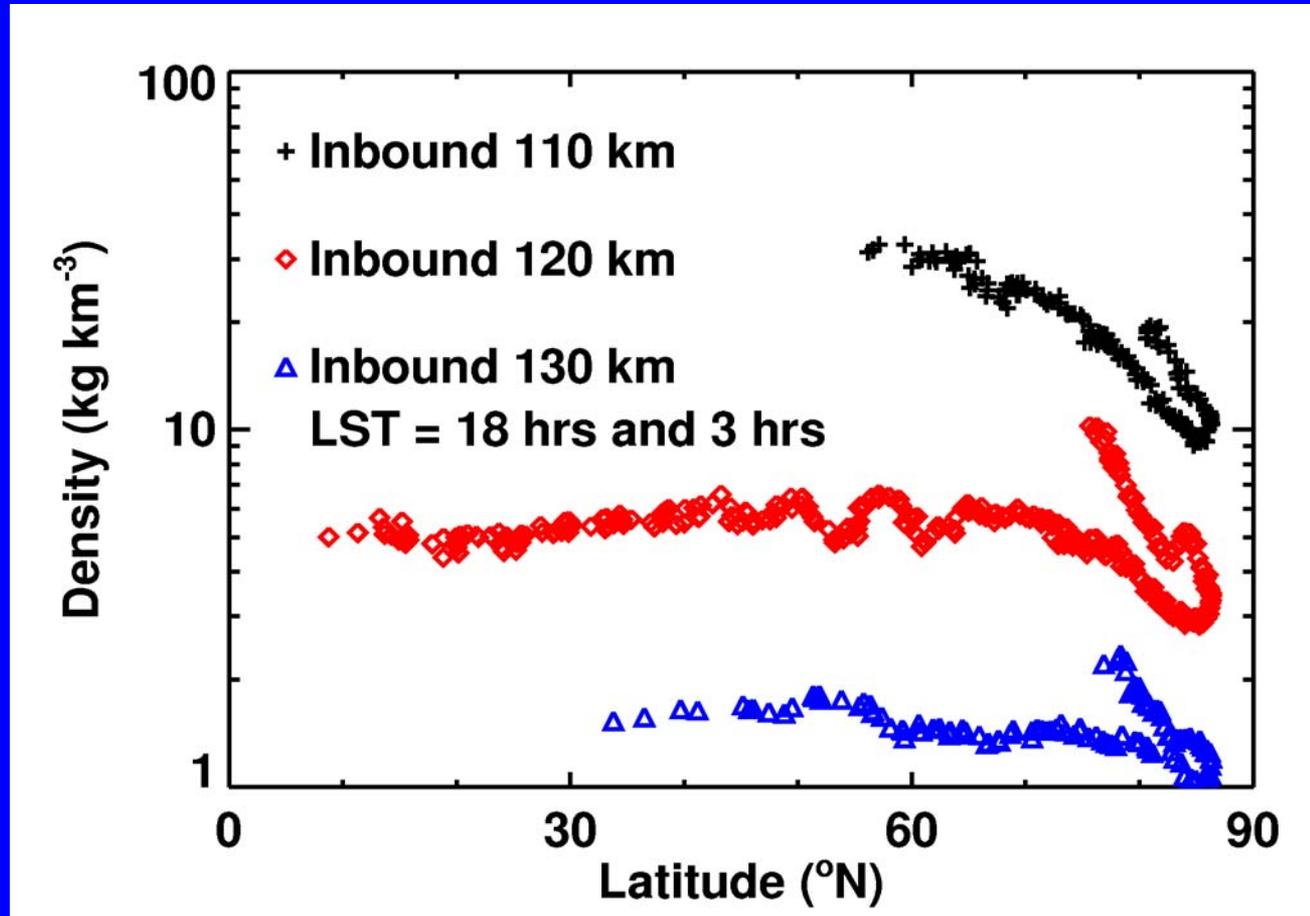
Density and density scale height at 110 and 120 km

Inbound density at 110 km shown here

Ongoing Work

- Acquire high-rate ACC data
- Deal with thrusters and angular motions
- Acquire accurate C_D and m
- Use same “sea level” as everyone else
- Validate, validate, validate
- Document, document, document
- PDS formatting

- Thermal tides were important for MGS, what about Odyssey?
- Contrast south pole at winter (MGS) and north pole at winter (Odyssey)
- What are the smallest scale density variations?
- Test model predictions



The End