

Travel times from GONG, HMI and artificial data

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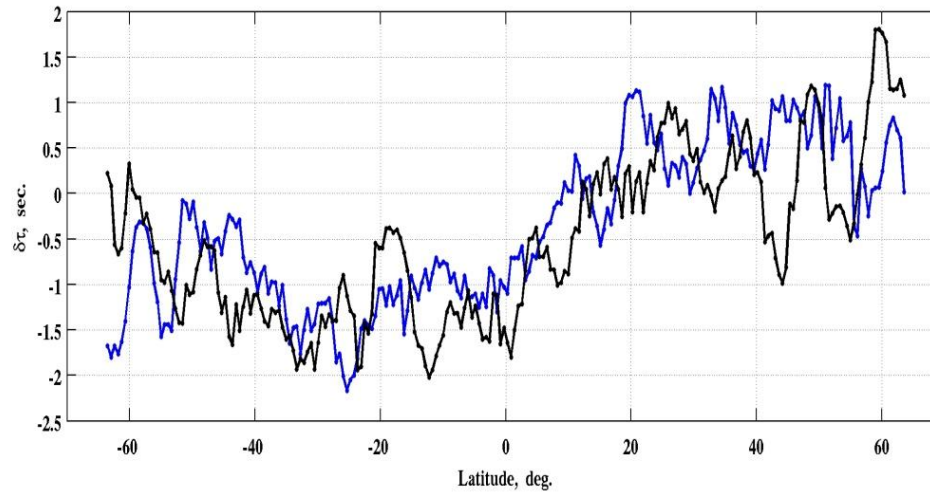
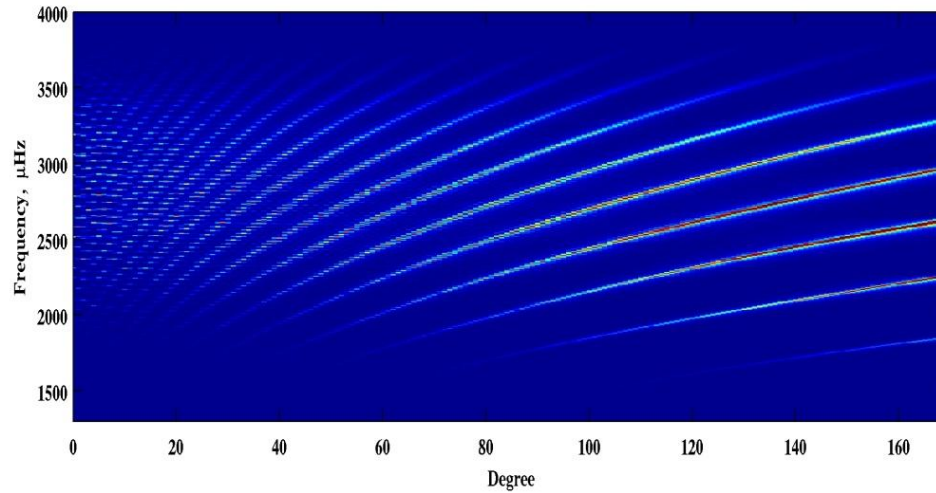
Outline

- Artificial **data**
- A small comparison of AIA and HMI travel times
- Torsional time differences from GONG SH time series

Artificial data

- Full sun wavefield simulations by Thomas
- $L=0-170$
- Split into front and far side “half-sun” time series
- SH decomposition
- Apply phase velocity filtering and reconstruct velocity images, several ($L_0=100, 120, 140$)
- Compute CCF and get North-South travel times

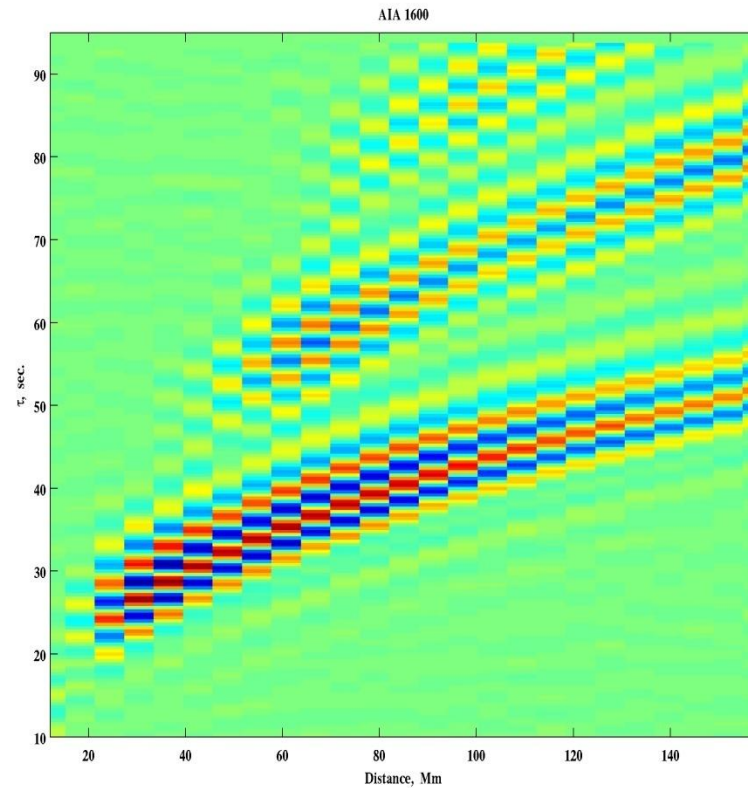
North-South time differences



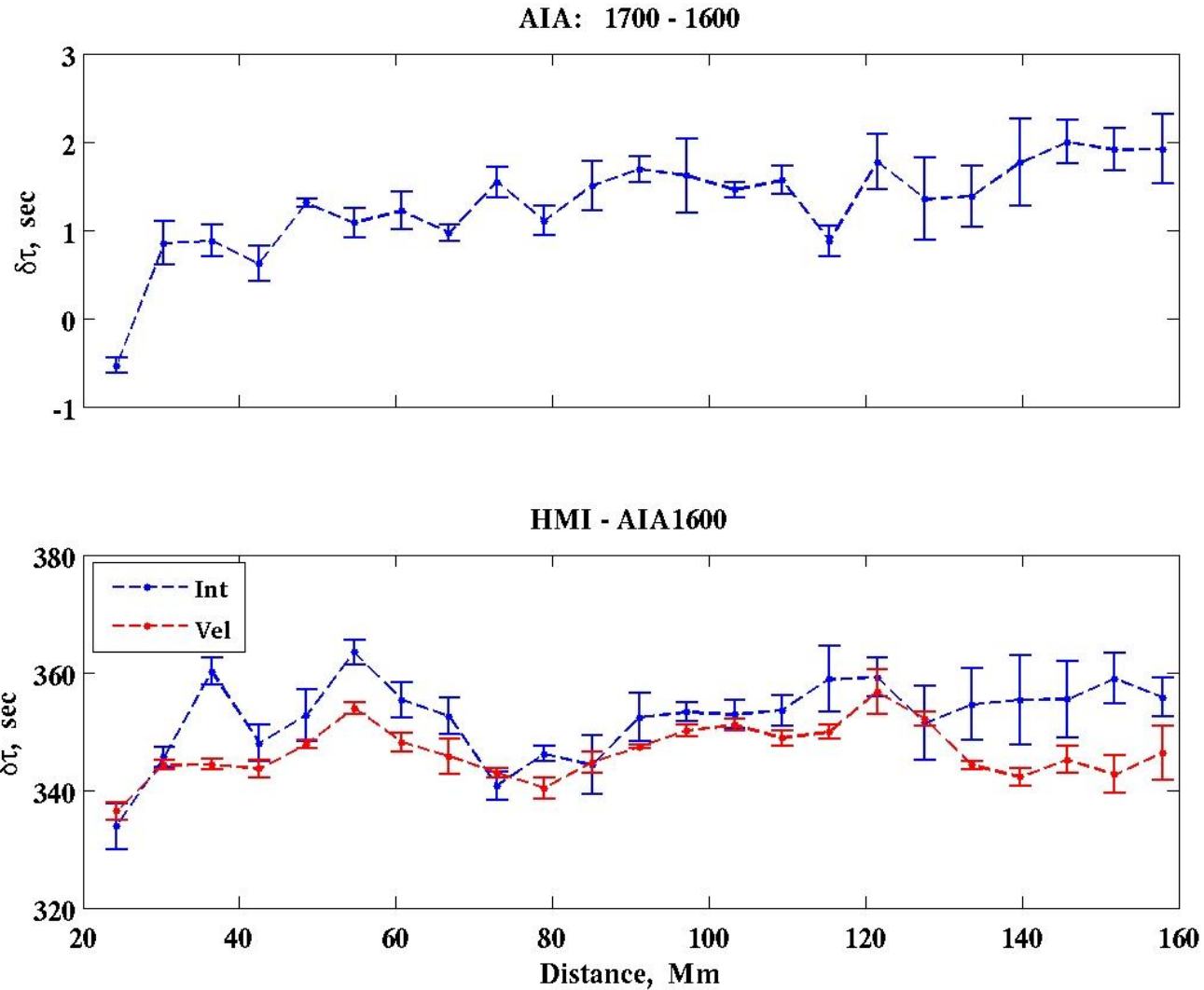
AIA and HMI comparison

- One day central 45x45 deg patch
- No filtering, remapping and tracking
- Phase times

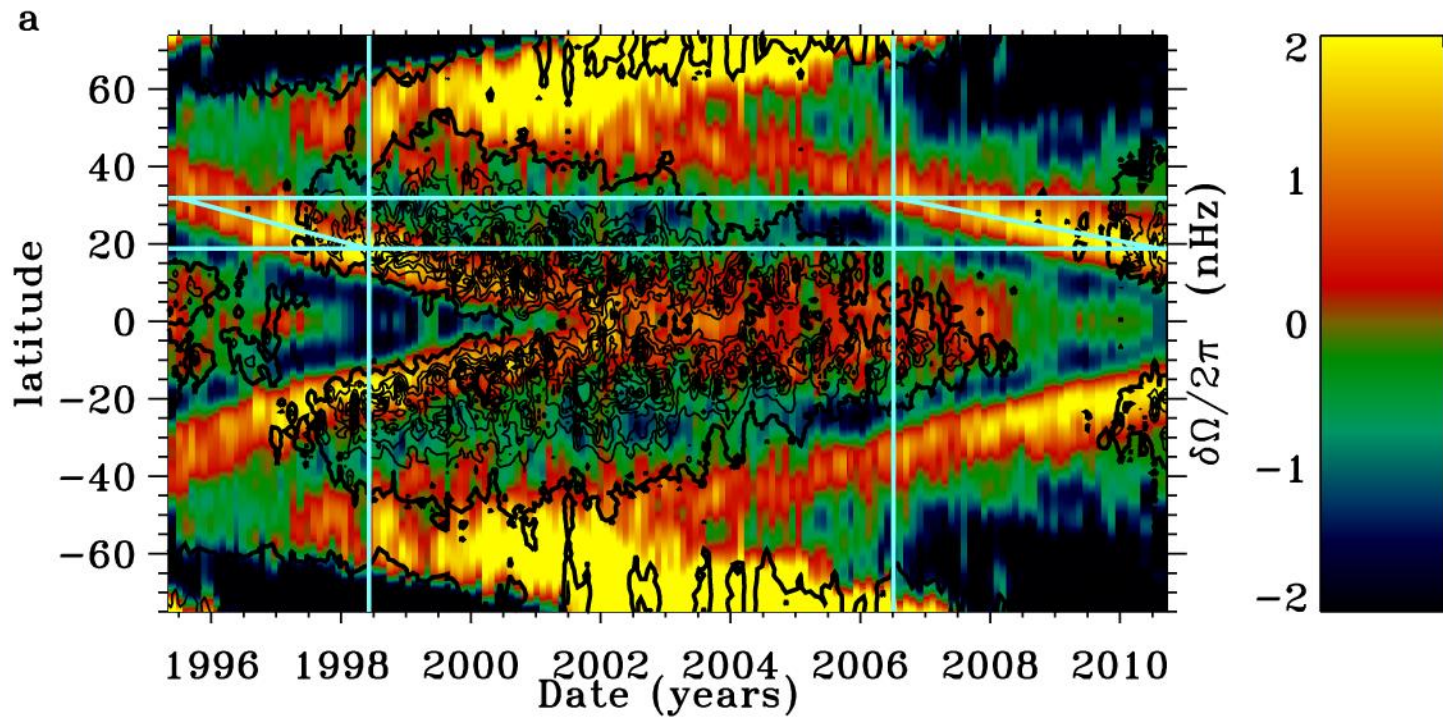
CCF example: AIA-1600



Travel-time difference between AIA and HMI



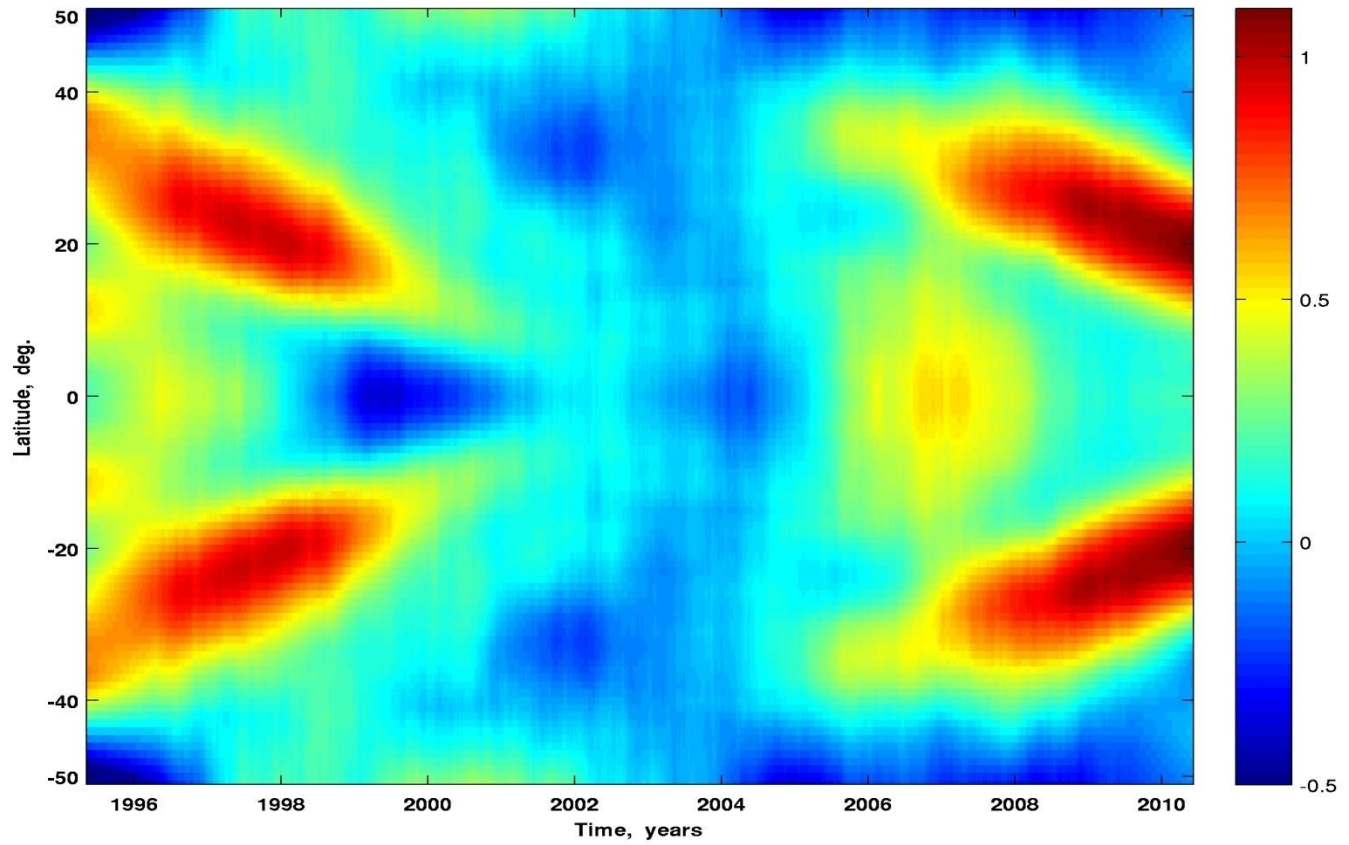
Torsional oscillations: GONG global modes (Rachel's plot)



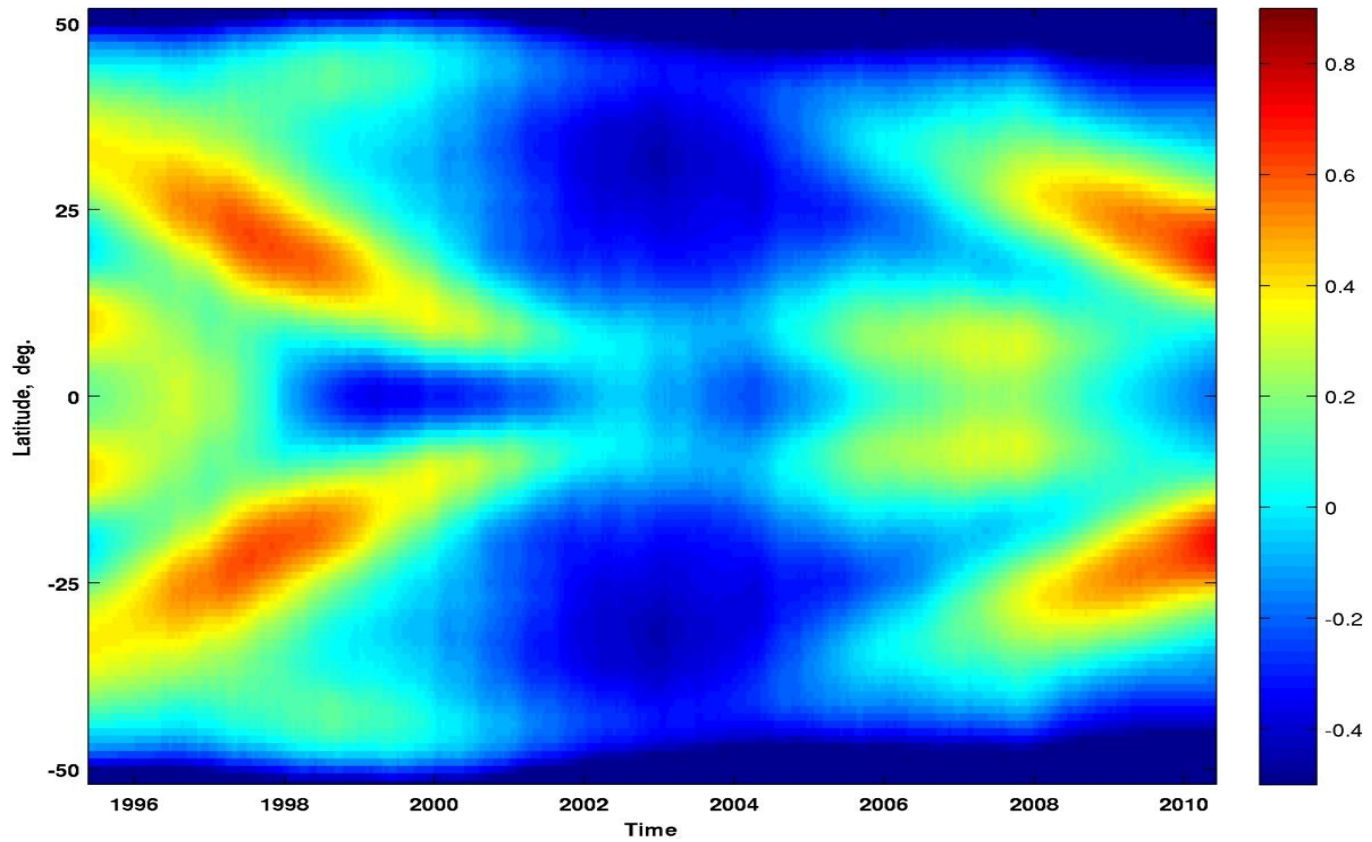
Travel times from GONG SH time series

- $L=0-200$
- May 1995 - June 2010
- Phase velocity filtering, reconstruction velocities (tracking)
- CCFs and East-West travel time differences

$L_0=120-170$



$L_0=160$



Direct measurements using velocity images

