

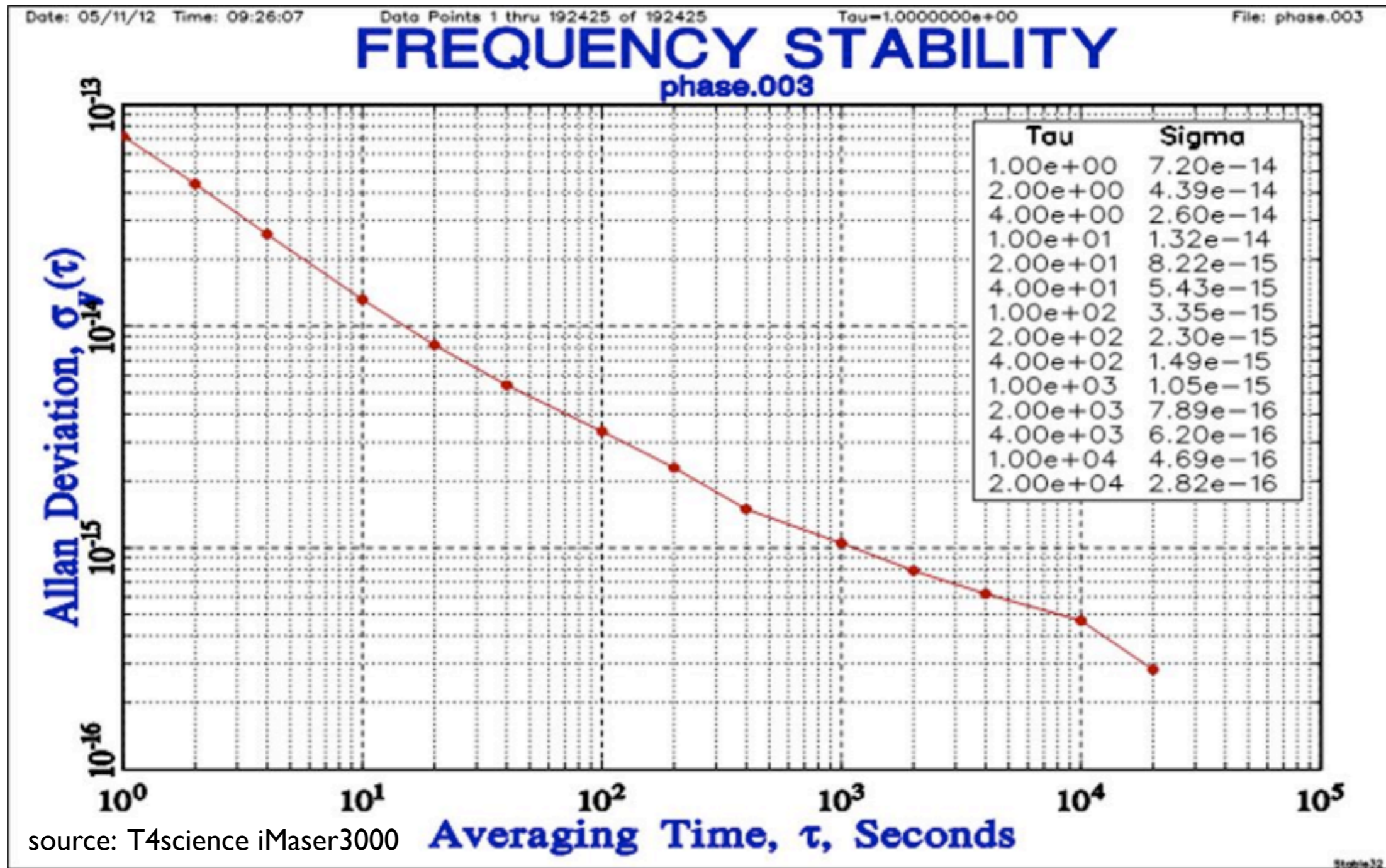
Using VLBI to demonstrate Long-Haul Fiber-Optic Frequency Transfer

Paul Boven

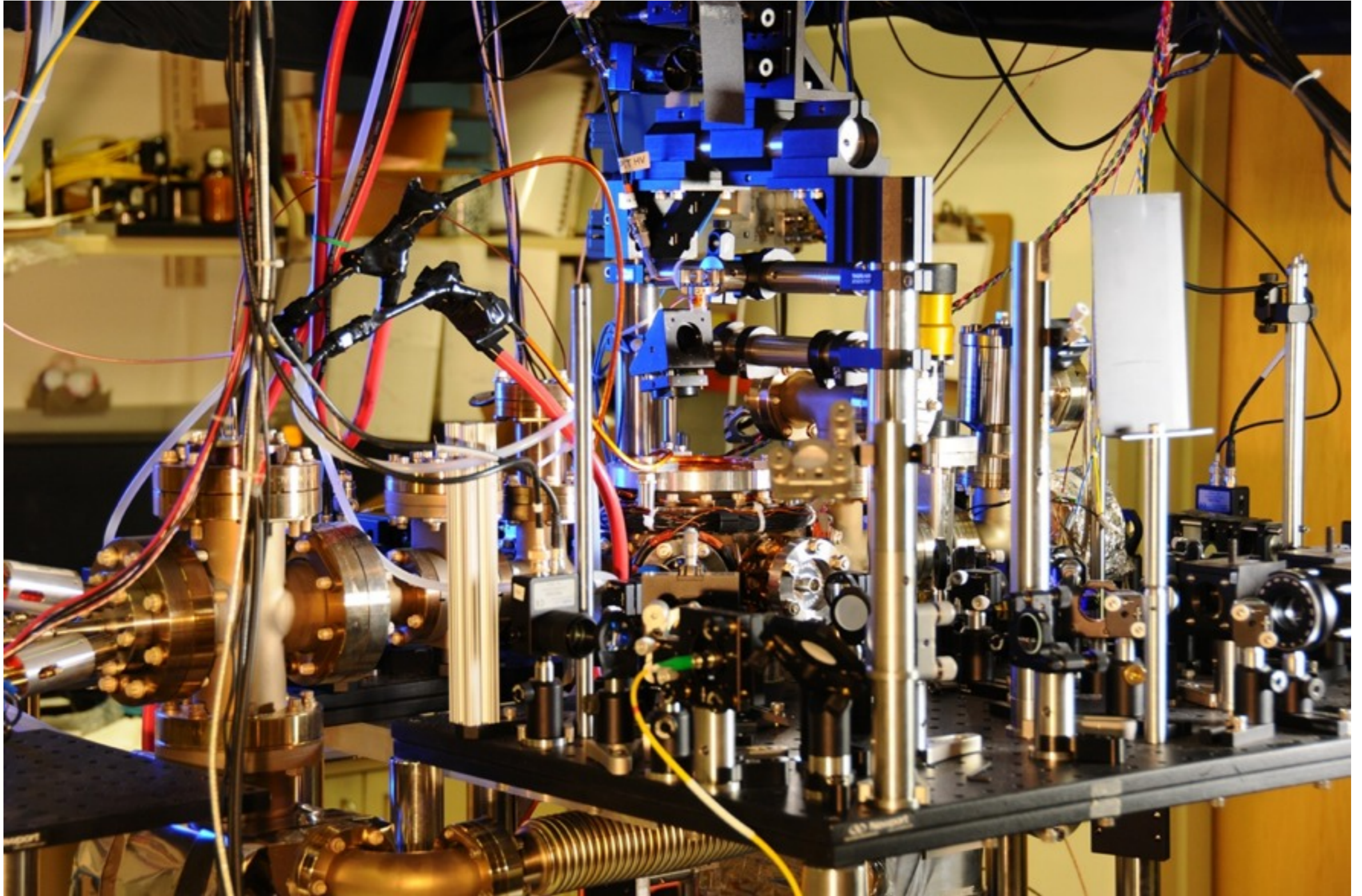


The VLBI timing workhorse

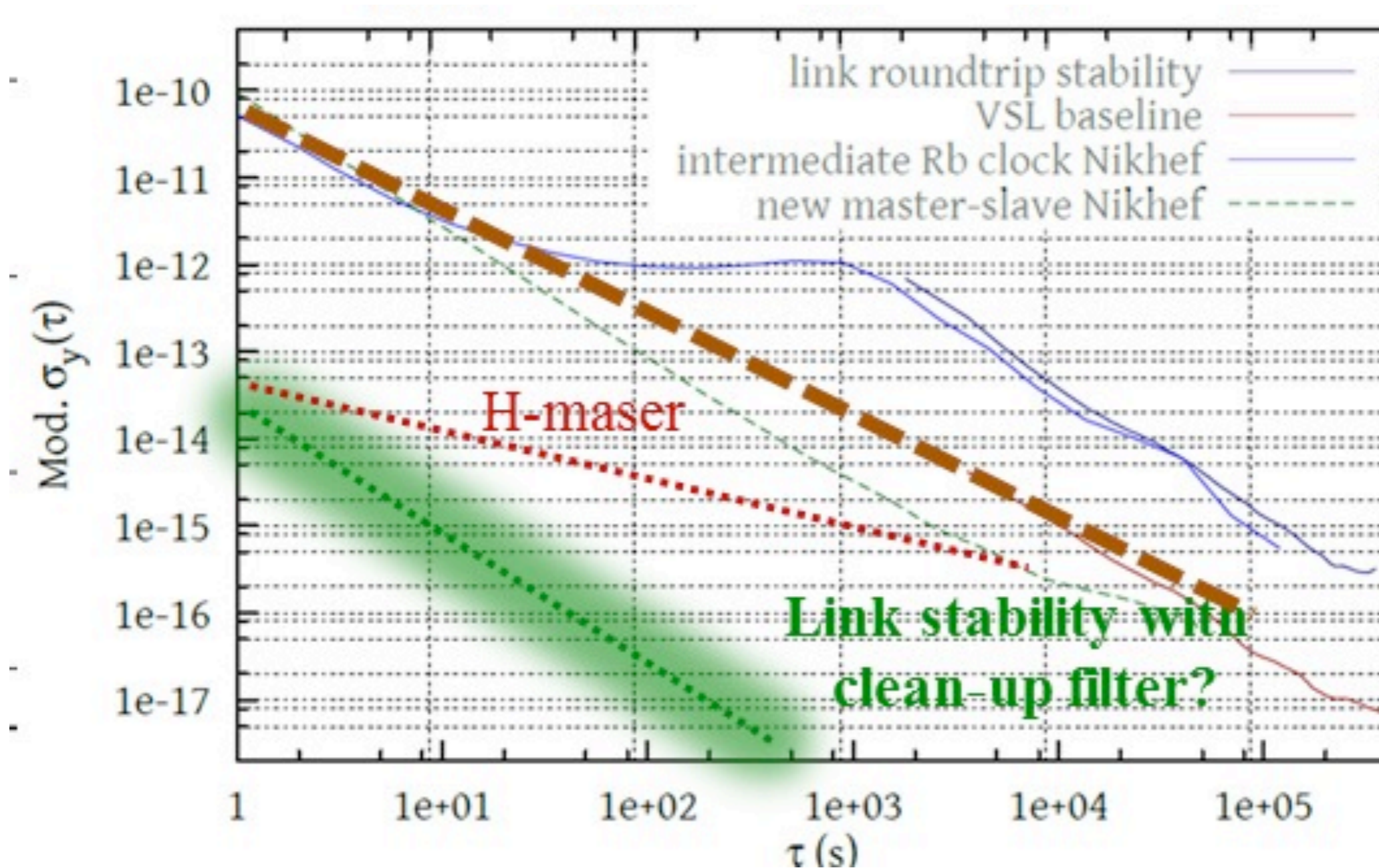
The Hydrogen Maser



NIST Yb clock: $1.6\text{E}-18$ in 7 hours



Optical frequency transfer



Planned WR link expected performance
(J.C. Koelemeij)

The End of VLBI

- e-VLBI: transfer sampled IF over network
- Clock distribution over fiber
- Connected element interferometer

VLBI without H-Masers

- Higher stability optical clocks
 - Better VLBI
- New 'old' telescopes
 - e.g. former Intelsat 30m dishes (AVN, Warkworth)
- No more fringe finding
 - One less free parameter



Saving the Dwingeloo Telescope



Current antennas

- Horn for 23cm (21cm) Circular
- Double Dipole for 70cm (H and V)
- Double Yagi for 2m



The Restoration

- A National Monument since 2009
- €880.000 awarded in 2011 (70%-rule)
- Started in April 2012



Flying Saucer



Re-opening 2014-04-05



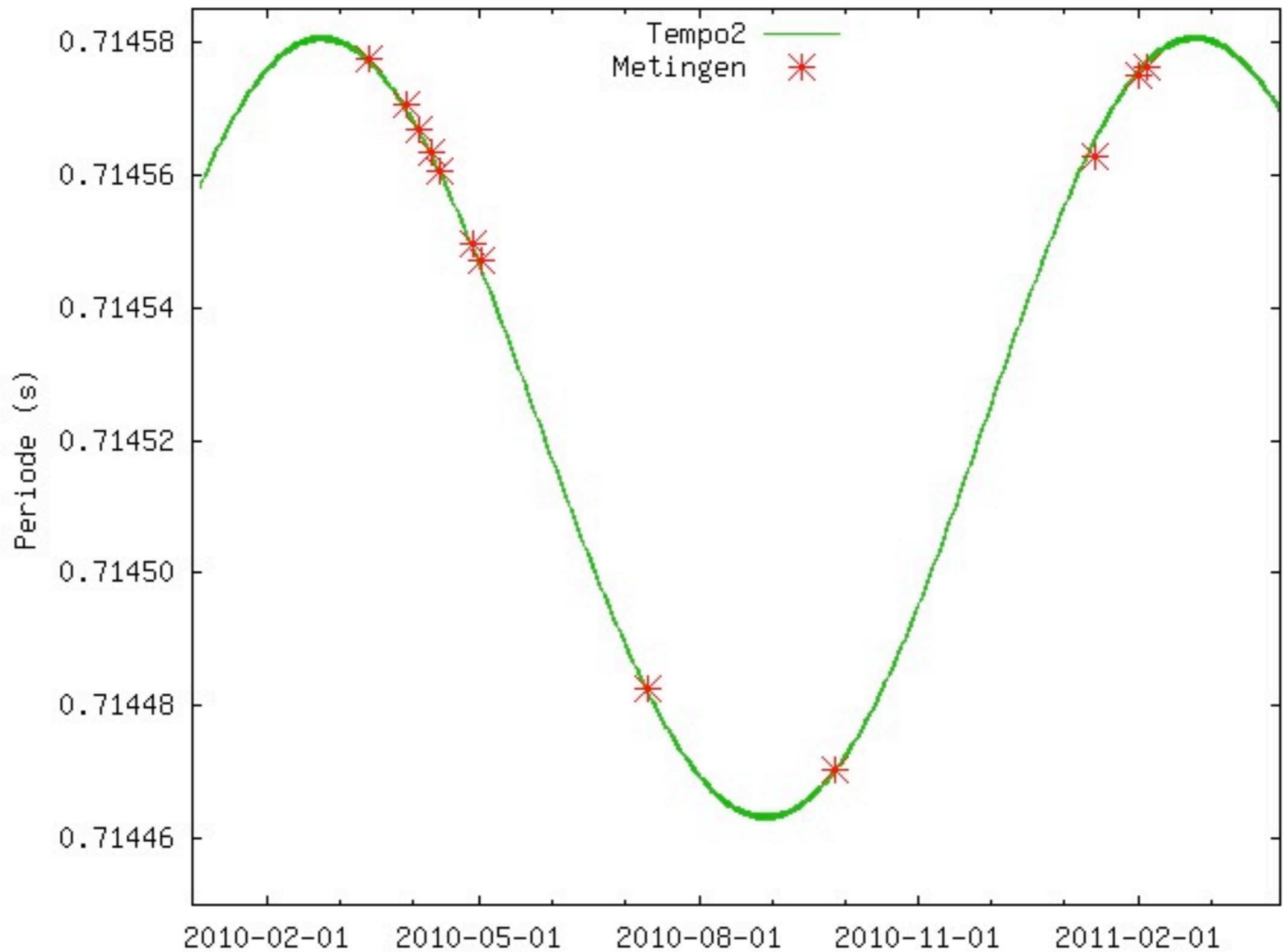
Prof. J.H. Taylor
(K1JT)



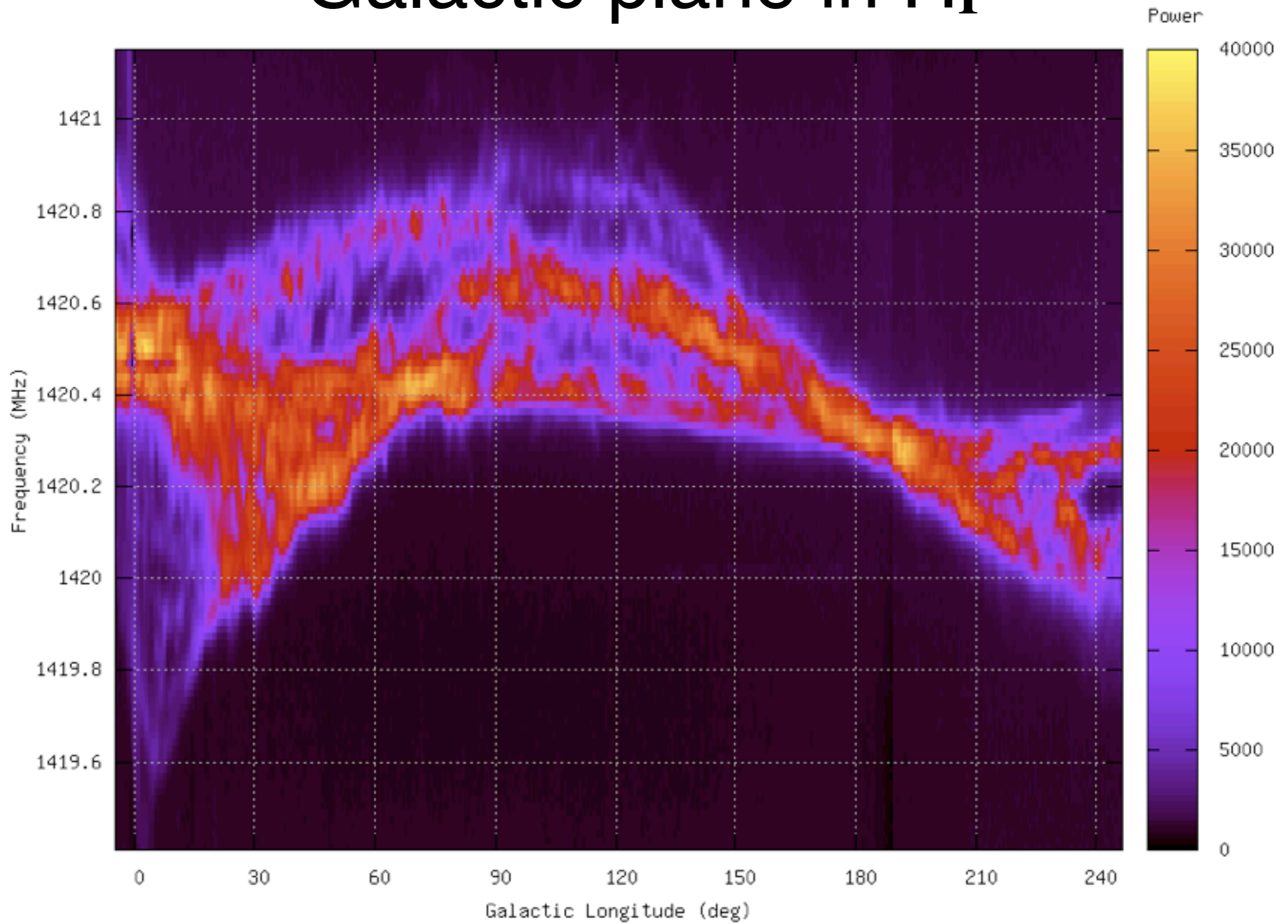
Our Volunteers



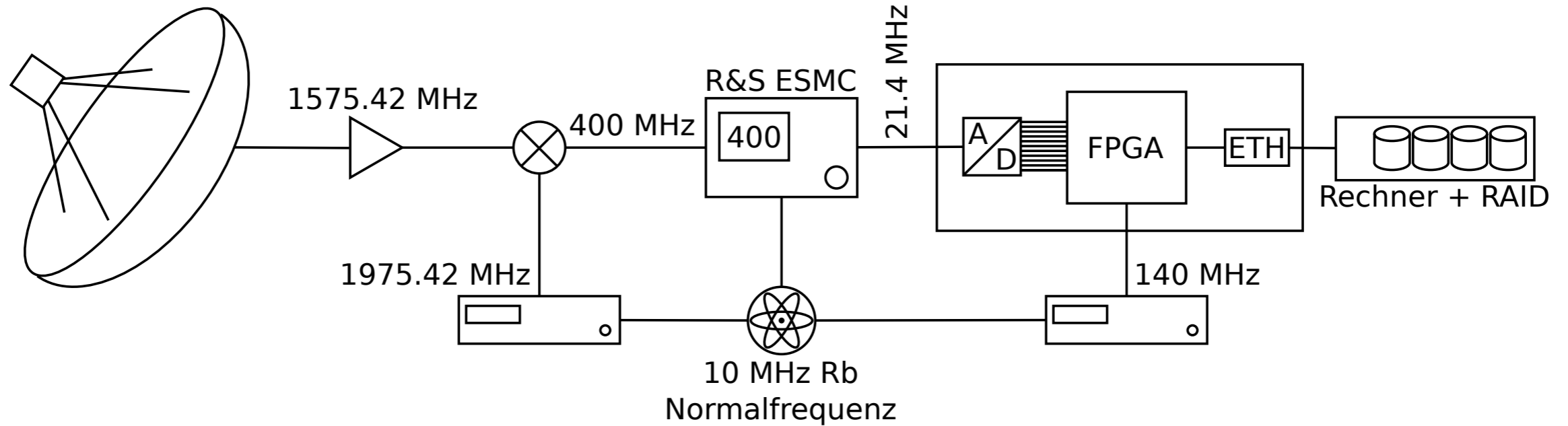
One year of B0329+54



Galactic plane in H_I



Full BW recording (700Mb/s)



Astéris

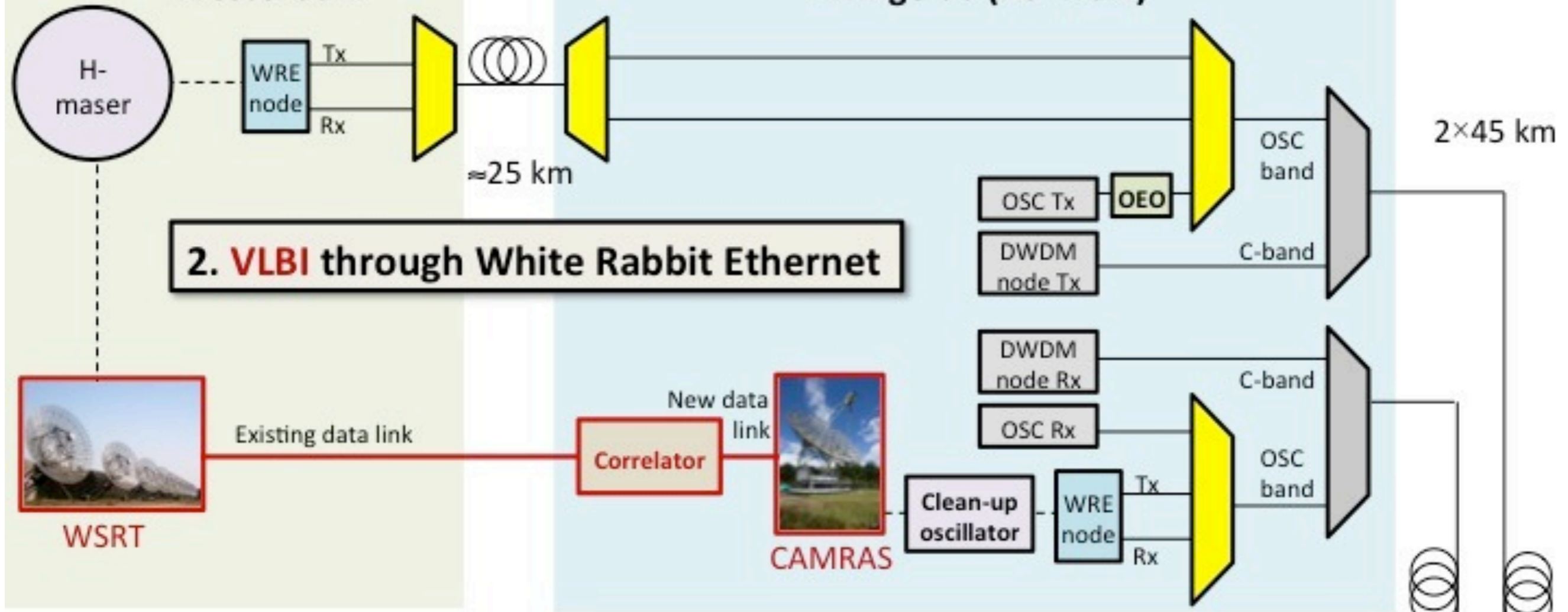
Astronomy ESFRI & Research Infrastructure Cluster

- Proposal submitted September 2014
- Address problems common to large or distributed astronomical facilities
- Includes research on time & frequency distribution

Westerbork

Dwingeloo (ASTRON)

2. VLBI through White Rabbit Ethernet



Groningen

Assen

