Herschel history
- short update

IAU#280: The Molecular Universe

Göran Pilbratt, Herschel Project Scientist

Hi-GAL – mapping the Galactic plane

Merry Christmas and a Happy New Year from the IFSI IR Team

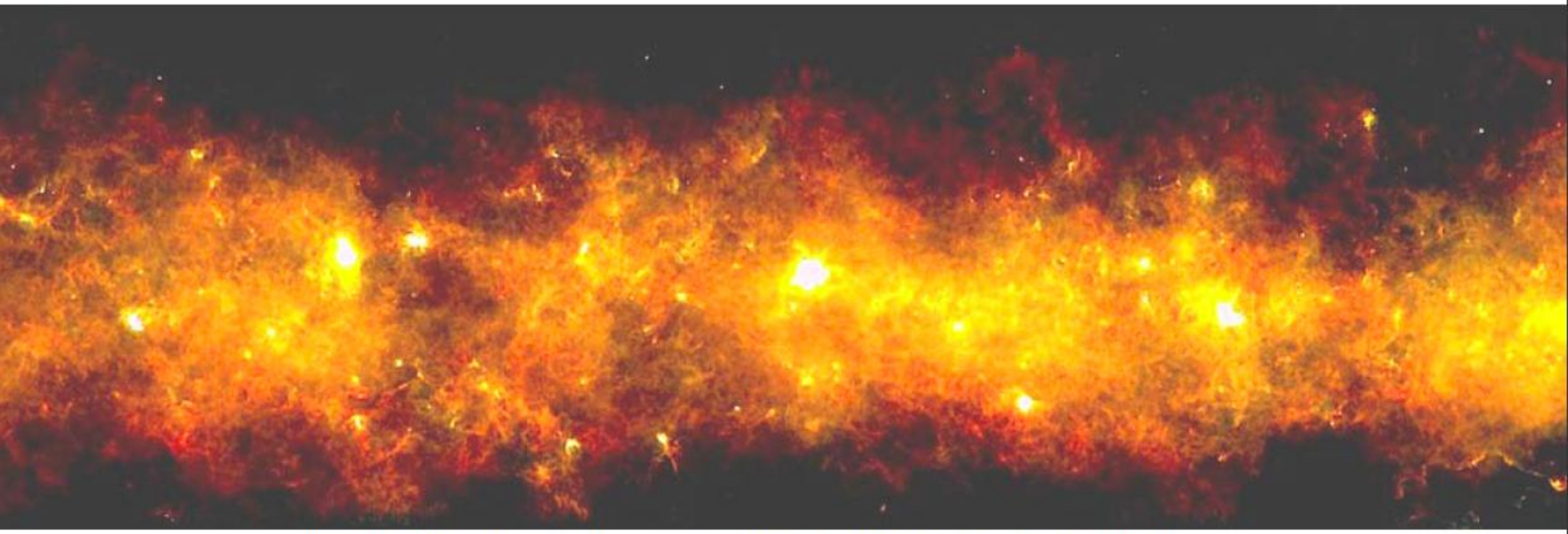
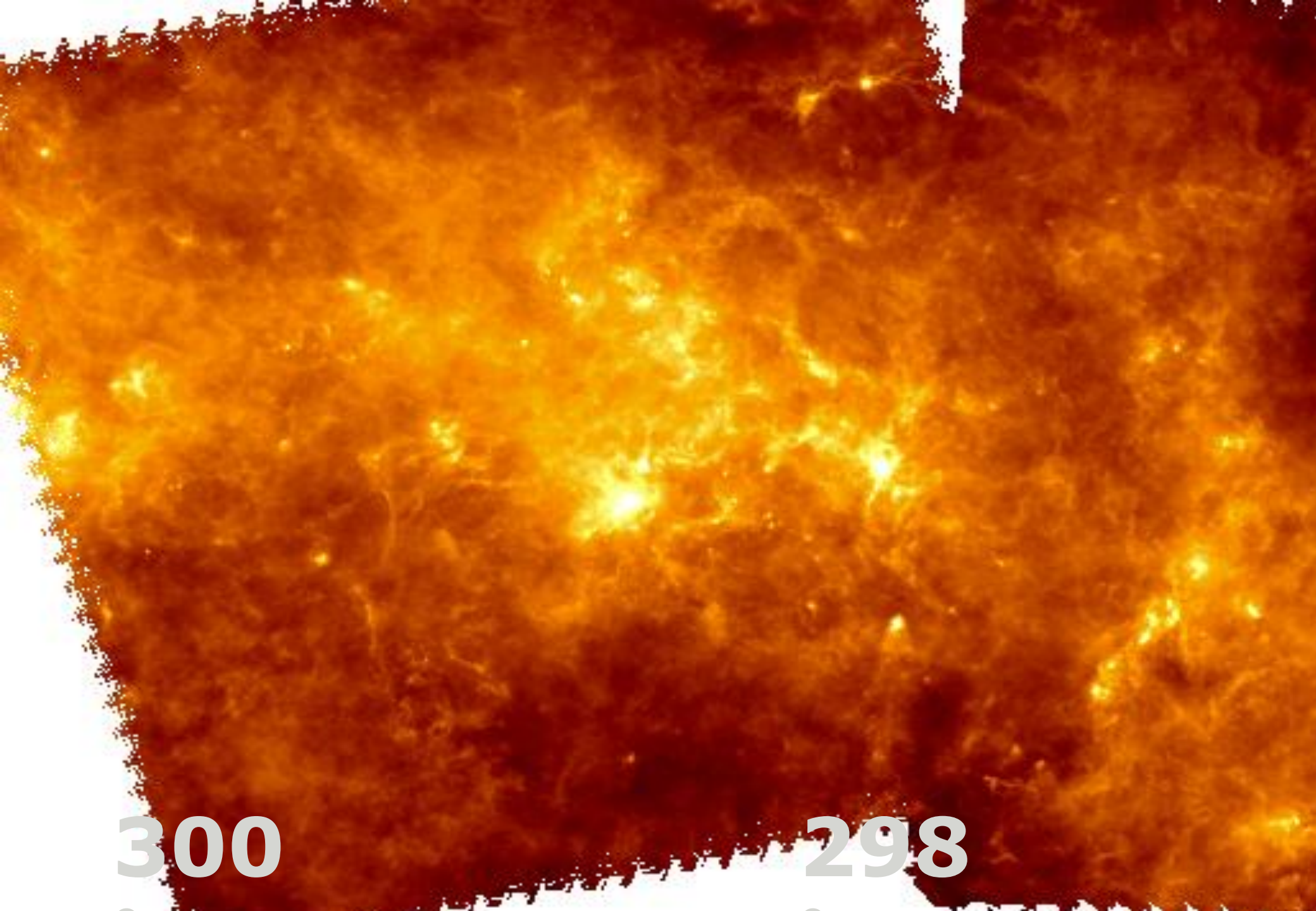


Image of the dust emission in a portion of the Galactic Plane obtained by combining Herschel data at 70, 160 and 350 microns.
The region spans some 10 degrees in galactic longitude and 2 in galactic latitude in the first quadrant (between l=36 and l=47) .


300
298

Communications

HERSCHEL SPACE OBSERVATORY

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Outreach Resources

9-May-2011 13:58:38 UT

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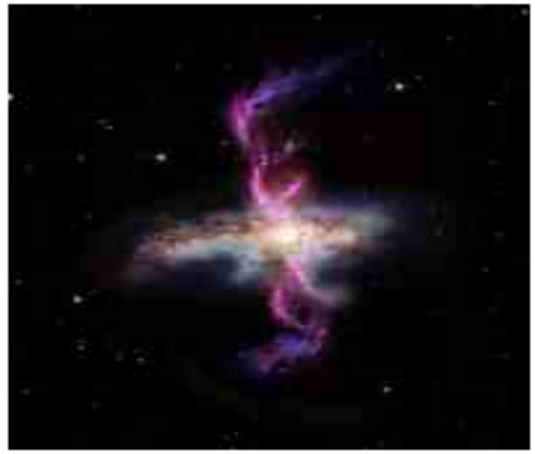
Caught in the act by Herschel: galactic storms sweep away the gas

09 May 2011

ESA's Herschel Space Observatory has detected massive amounts of molecular gas gusting at high velocities - in some cases in excess of 1000 kilometres per second - from the centres of a set of merging galaxies. Driven by star formation and central black holes, these powerful storms are strong enough to sweep away billions of solar masses of molecular gas and to interfere with global galactic processes. These observations indicate that, in the galaxies hosting the brightest Active Galactic Nuclei, outflows can clear the entire supply for creating stars and feeding the black hole. This finding provides long-sought-after evidence of highly energetic feedback processes taking place in galaxies as they evolve.



Massive outflows of gas from galactic centres are tell-tale signs that powerful, storm-like processes affecting the global galactic balance of mass and energy are underway. Within a galaxy, these storms can be generated in the regions of active star formation, stirred by stellar winds and shock waves from supernova explosions. They can also be triggered close to the central black hole, where radiation pressure from the accretion disc drives the surrounding gas away. When powerful enough, outflows can sweep

IMAGES AND VIDEOS

Artist's impression of galactic outflows

Detecting molecular gas outflows in galaxies with Herschel

MORE

SEE ALSO
- Raging storms sweep away galactic gas

RELATED LINKS
- The SHINING Key Programme
- More about Herschel Key Programmes
- Simulation movie of galaxy mergers

RELATED PUBLICATIONS
- Sturm et al. [2011]
- Fischer et al. [2010]

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HERSCHEL

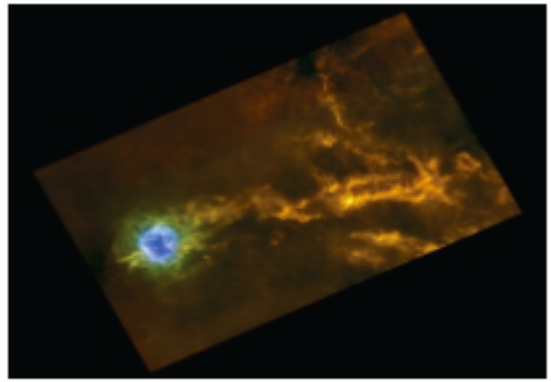
19-Apr-2011 07:53:56 UT

Herschel unravels the thread of star formation in the Gould Belt

13 Apr 2011

An intricate network of filamentary structure, exposed in extraordinary detail by the Herschel Space Observatory, has provided new evidence for how stars form from the diffuse interstellar medium. These filaments, located in giant molecular clouds in the Gould Belt, all exhibit remarkably similar widths – about one third of a light year – but only the densest ones contain pre-stellar cores, the seeds of future stars. These data suggest star formation is a two-step process: first turbulence stirs up the gas, giving rise to a web-like structure, then gravity takes over and governs the further fragmentation of filaments into stars.

Giant molecular clouds are huge complexes of gas and dust characterised by a very low density, even thinner than air. Many of these clouds are the sites of stellar birth, but how this diffuse mixture condenses into compact cores, which later evolve into stars, is still an open question in astrophysics.



The star-forming cloud IC 5146.
Credit: ESA/Herschel/SPIRE/

"Filaments are the first structures to develop in the fragmentation process of molecular clouds, hence they're the objects to

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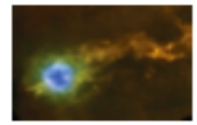
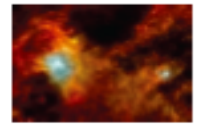
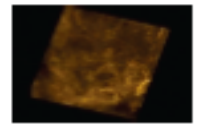
IMAGES AND VIDEOS


Herschel image of IC 5146


Herschel image of Aquila Rift


Herschel image of the Polaris Flare

MORE

SEE ALSO
- Herschel links star formation to sonic booms

RELATED LINKS
- The Gould Belt Survey

RELATED PUBLICATIONS
- Arzoumanian, D., et al. [2011]
- André, Ph., et al. [2010]

PR aka Communications

ESA wants to communicate your results

- Provides expertise/resources – science writers, image making
- Provides the channels – websites, mailing lists, etc
- All material can be used by others
- Wants to create win-win situation

Possibilities

- Web-releases – Portal and/or SciTech
- Exceptionally fully fledged press release
  - Press reps invited in person
  - Done in connection with 'First Results Symp' in May 2010

Project Scientist is your contact point

- PS will initiate process – applying for resources
- Web-page providing information to come…

Observing oppportunities

HERSCHEL SPACE OBSERVATORY

AO-2 overall schedule

GT2

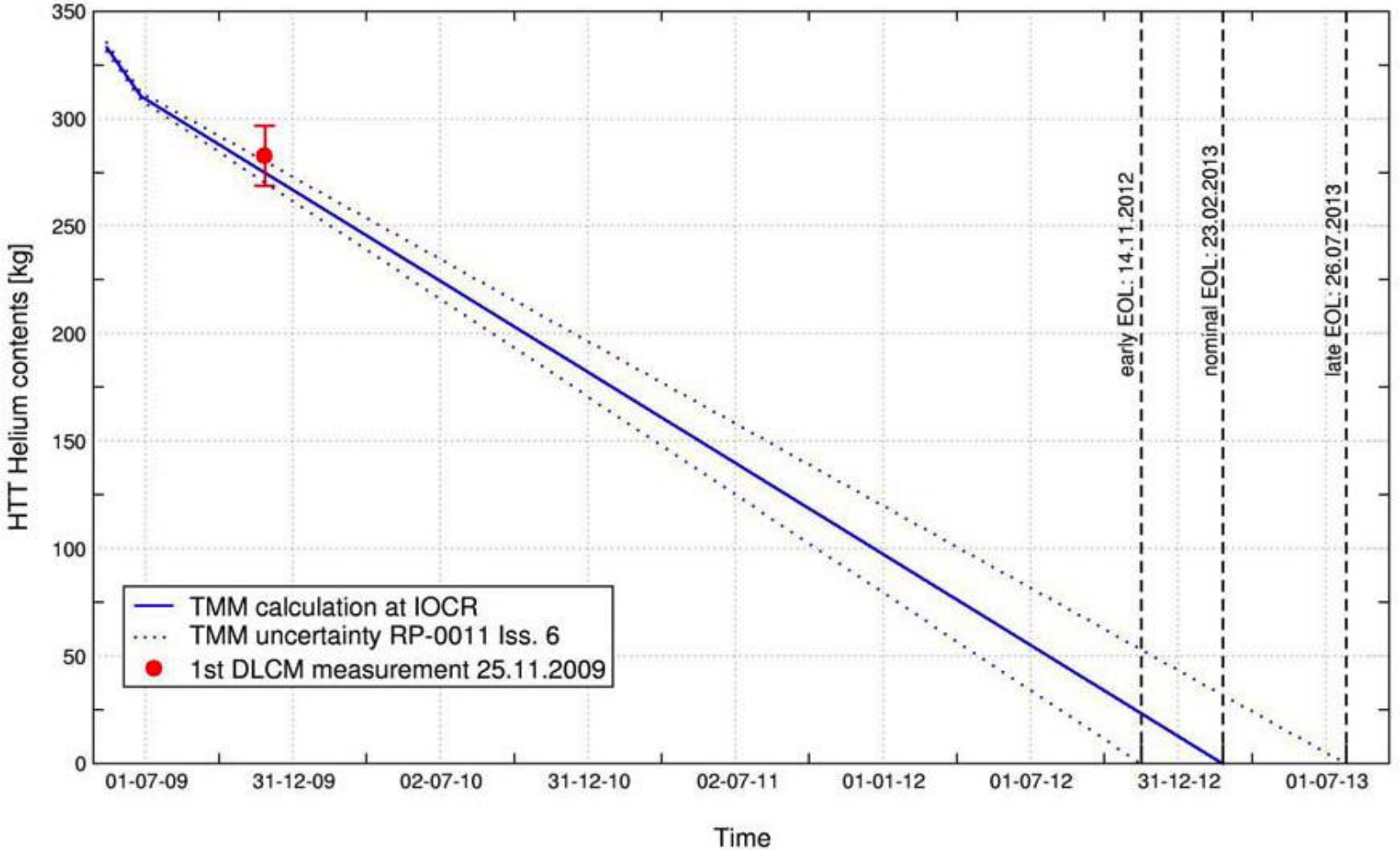
- Opening: 7 April 2011
- Proposal submission deadline: 12 May 2011
- Followed by:
  - D/SRE decision
  - 'phase 2' AOR consolidation
  - HROST update for OT phase

OT2

- Opening: 9 June 2011
- Proposal submission deadline: 15 September 2011
- HOTAC meeting: 8-11 November 2011
- Followed by:
  - D/SRE decision
  - 'phase 2' AOR consolidation
  - HROST update

Mission (cryostat) lifetime

(i) Thermal modelling, and (ii) He mass measurements



HERSCHEL SPACE OBSERVATORY

Mission (cryostat) lifetime

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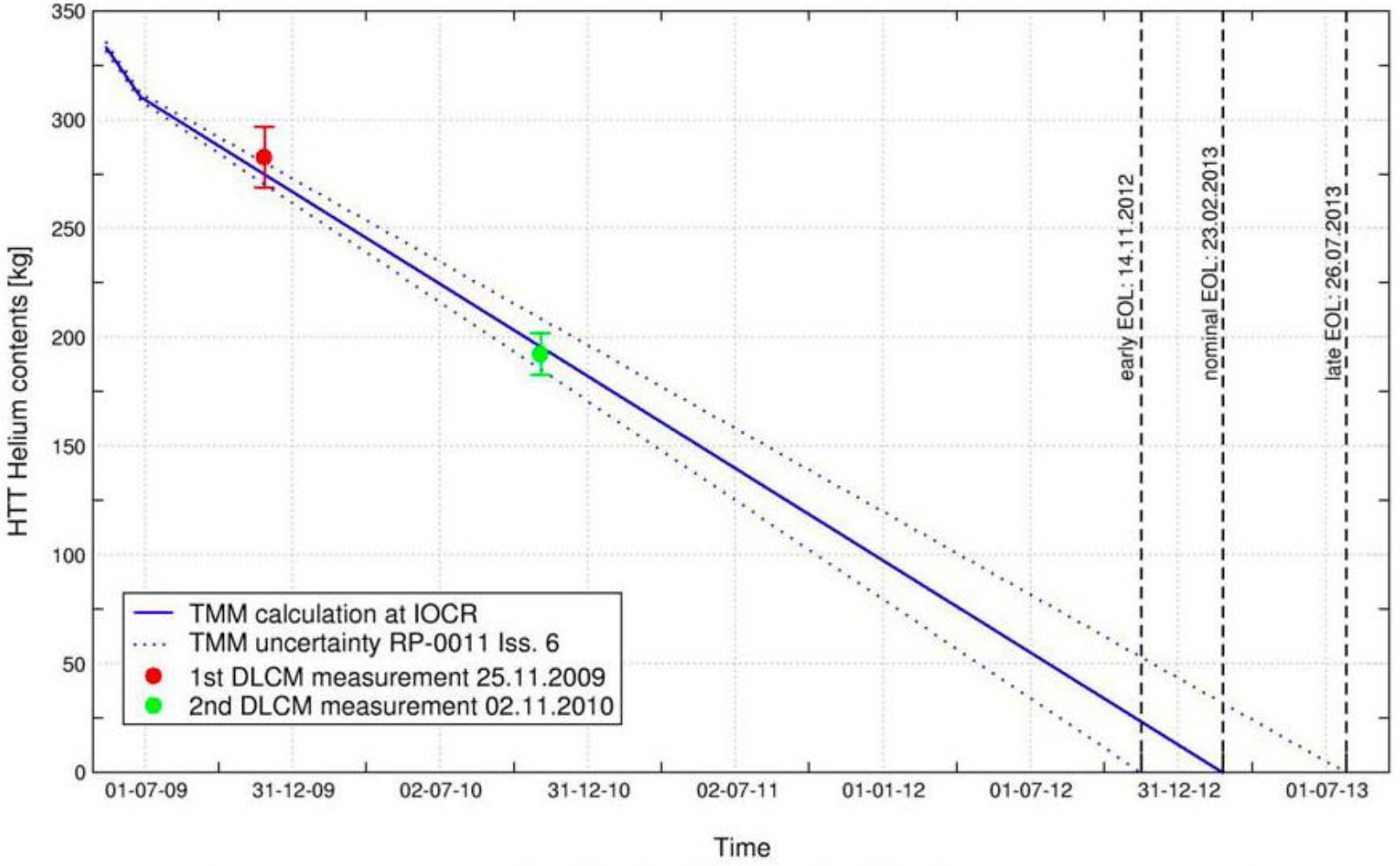
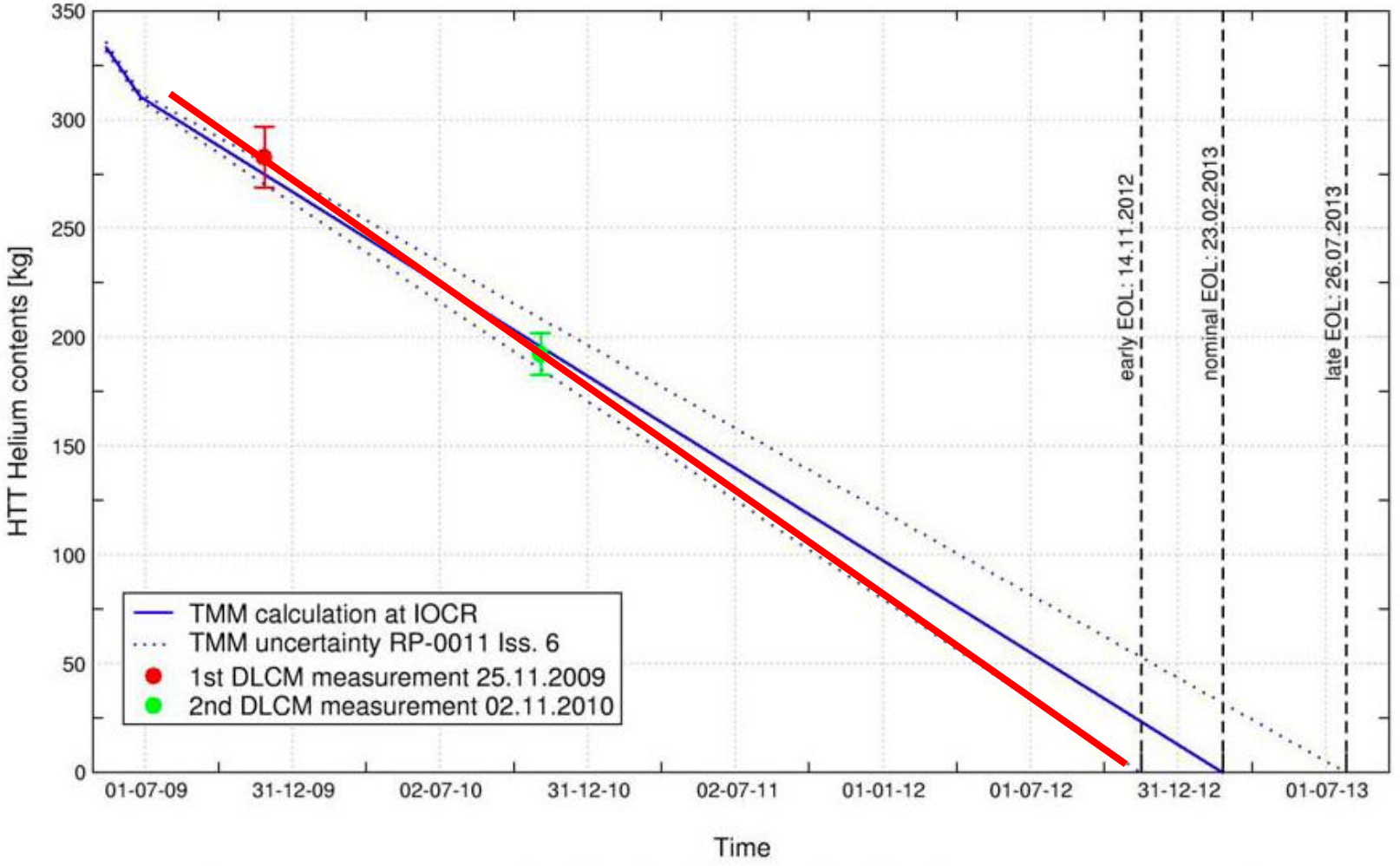


HERSCHEL SPACE OBSERVATORY

Mission (cryostat) lifetime

One prediction …



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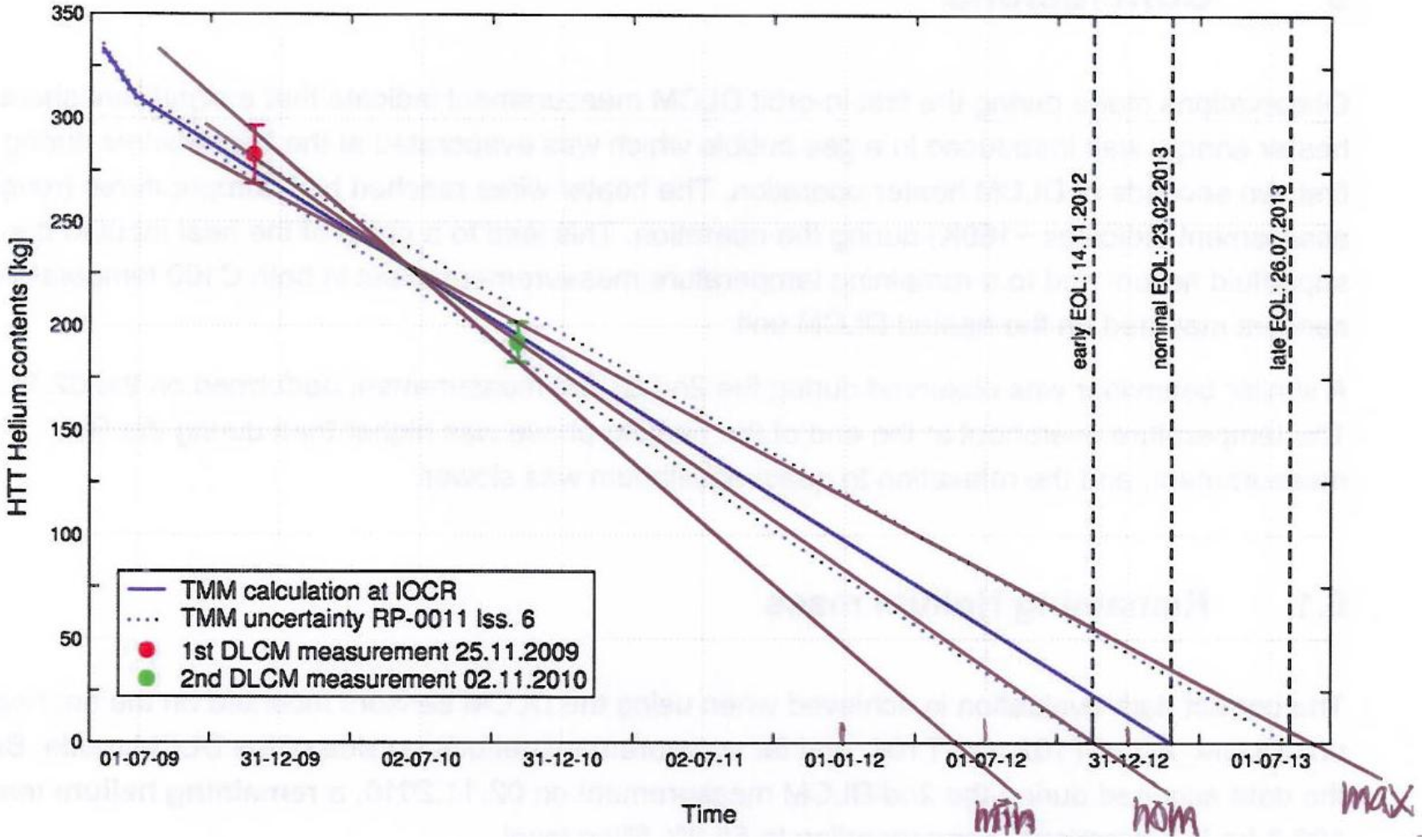
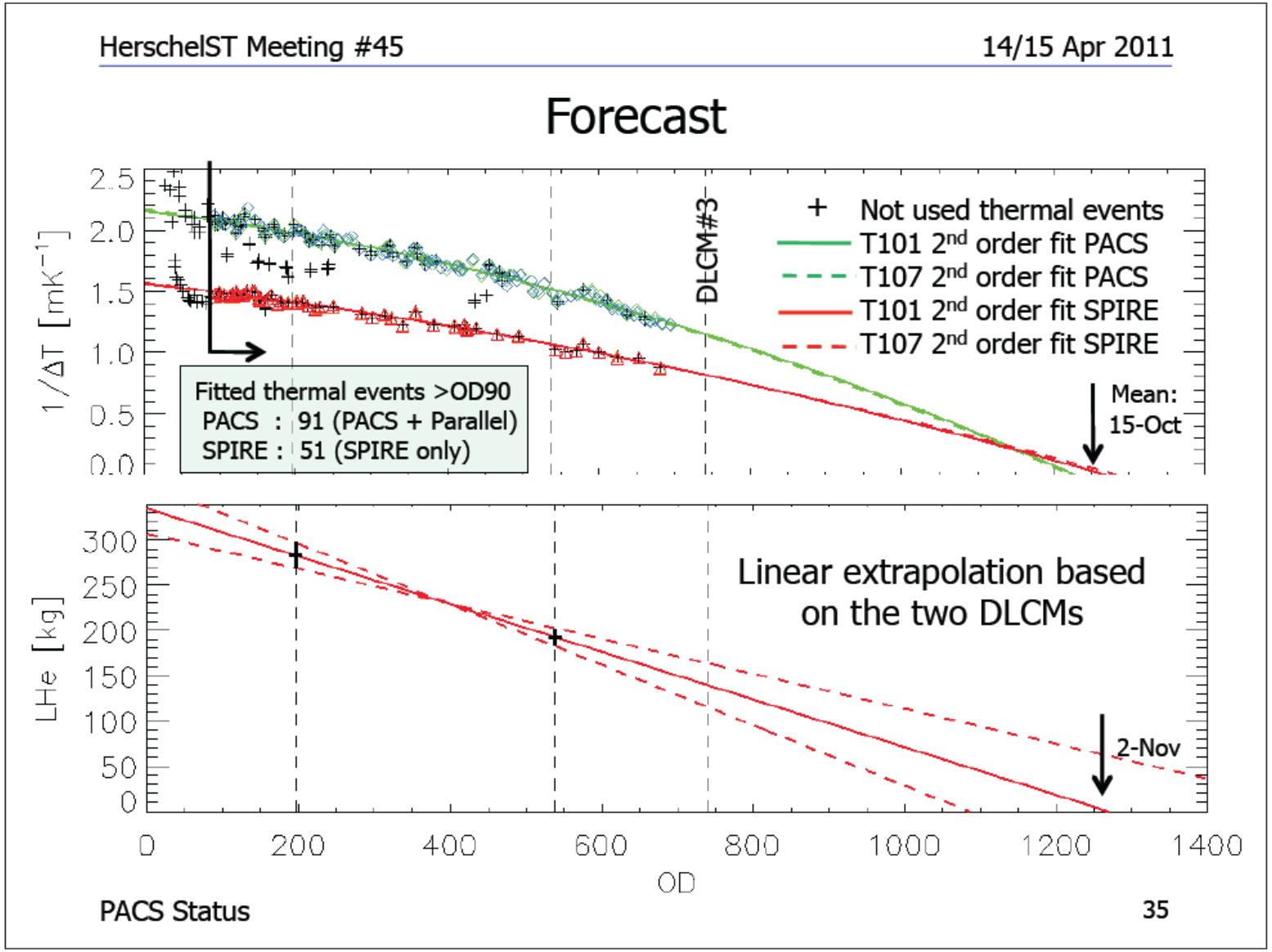
Mission (cryostat) lifetime

… but large uncertainties (and neglecting TMM)



HERSCHEL SPACE OBSERVATORY

'PACS method' – use cooler recyclings



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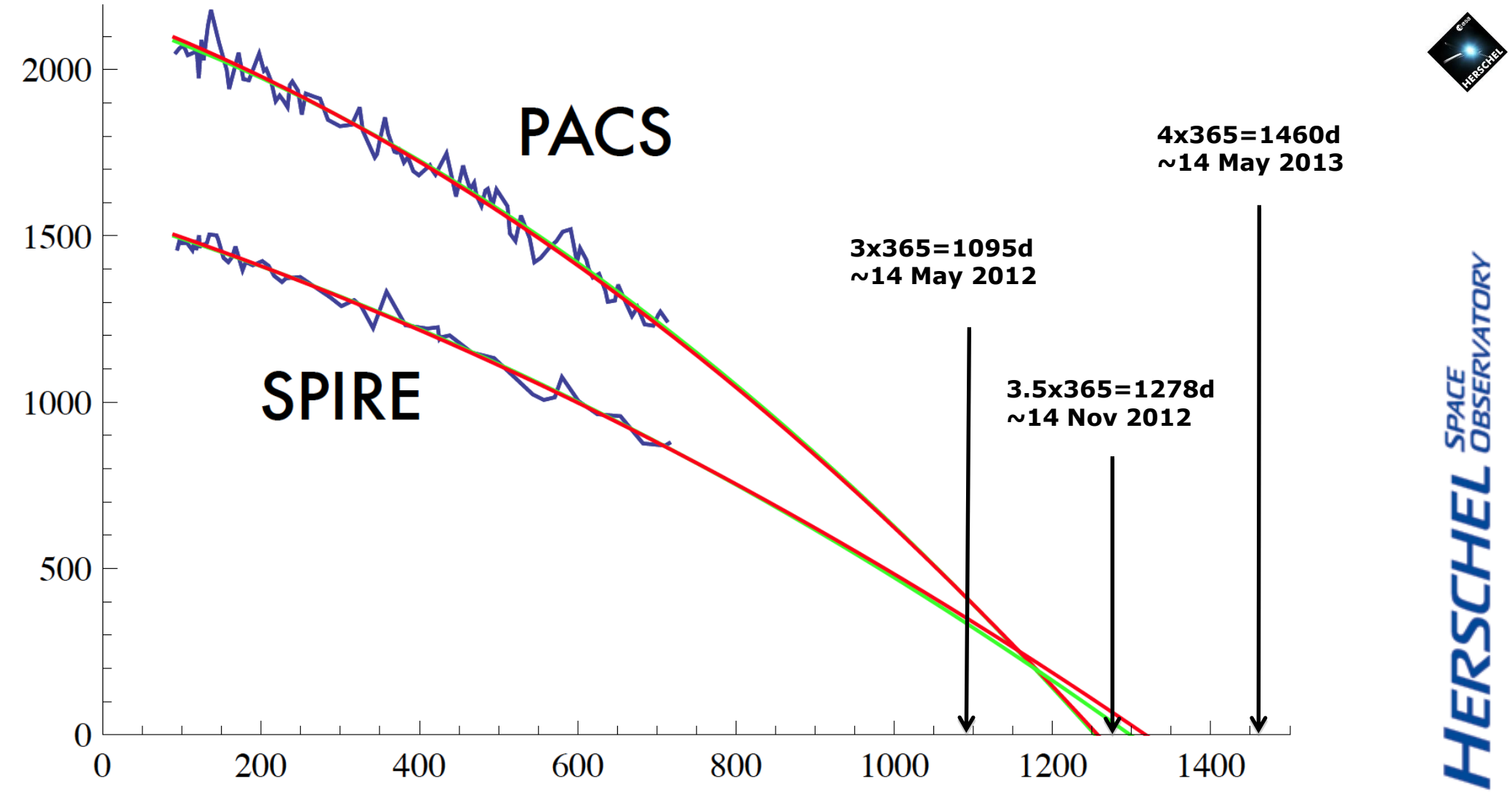
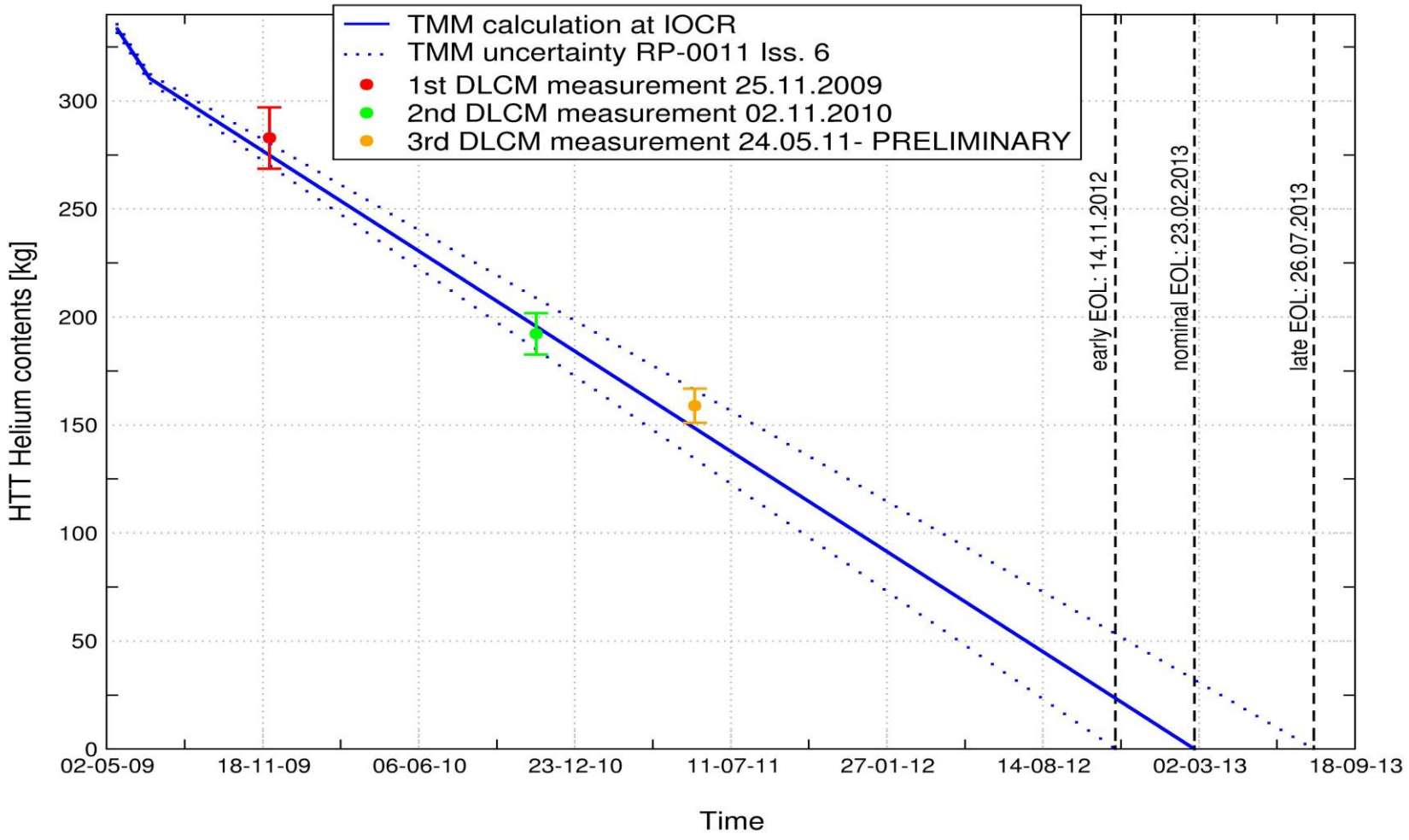


Mission (cryostat) lifetime

(i) Thermal modelling, and (ii) He mass measurements



HERSCHEL SPACE OBSERVATORY

Mission (cryostat) lifetime

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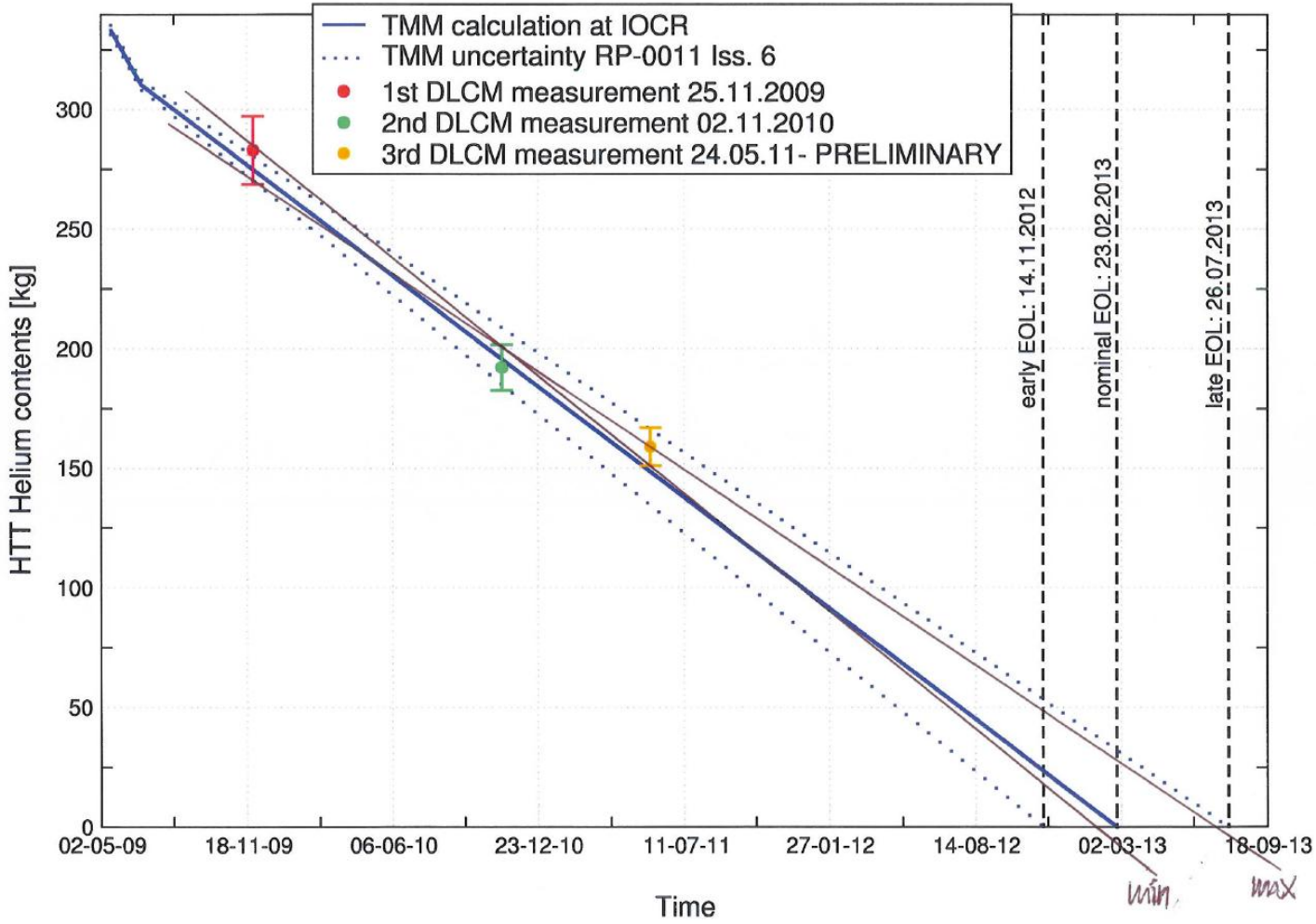
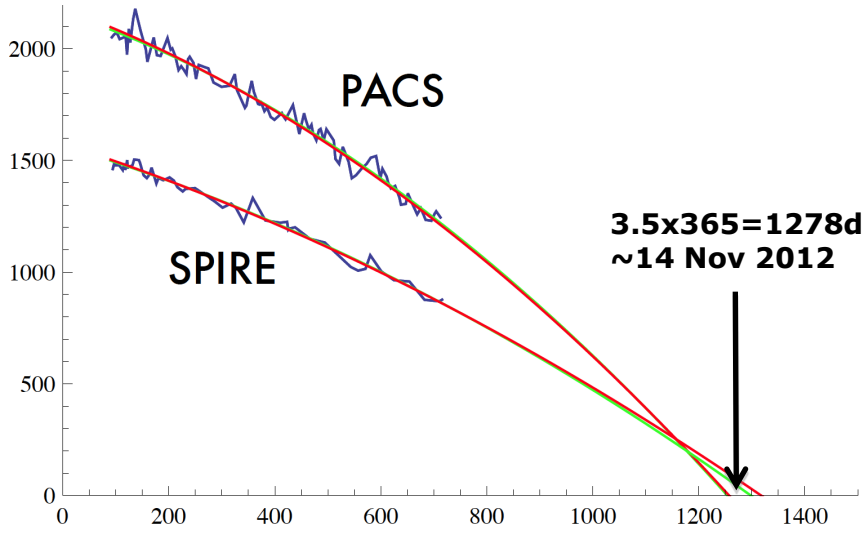
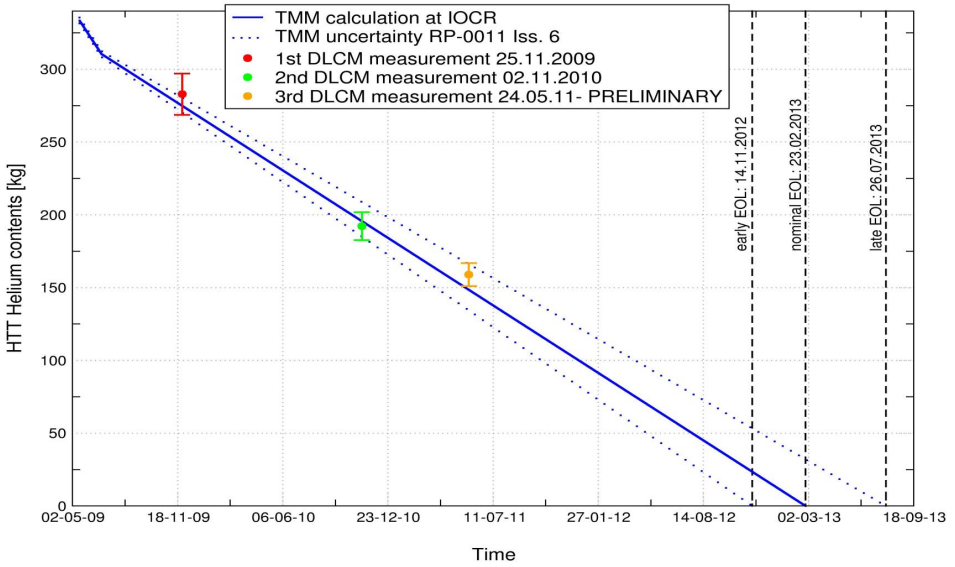


Mission lifetime – 'Hubble situation'?

Two different estimates(?)





'Hubble situation':

- Two measurements - use the 'best' one … without understanding why the results were different…
- Do *we* understand why we get different estimates?
- Which one do *we* believe?

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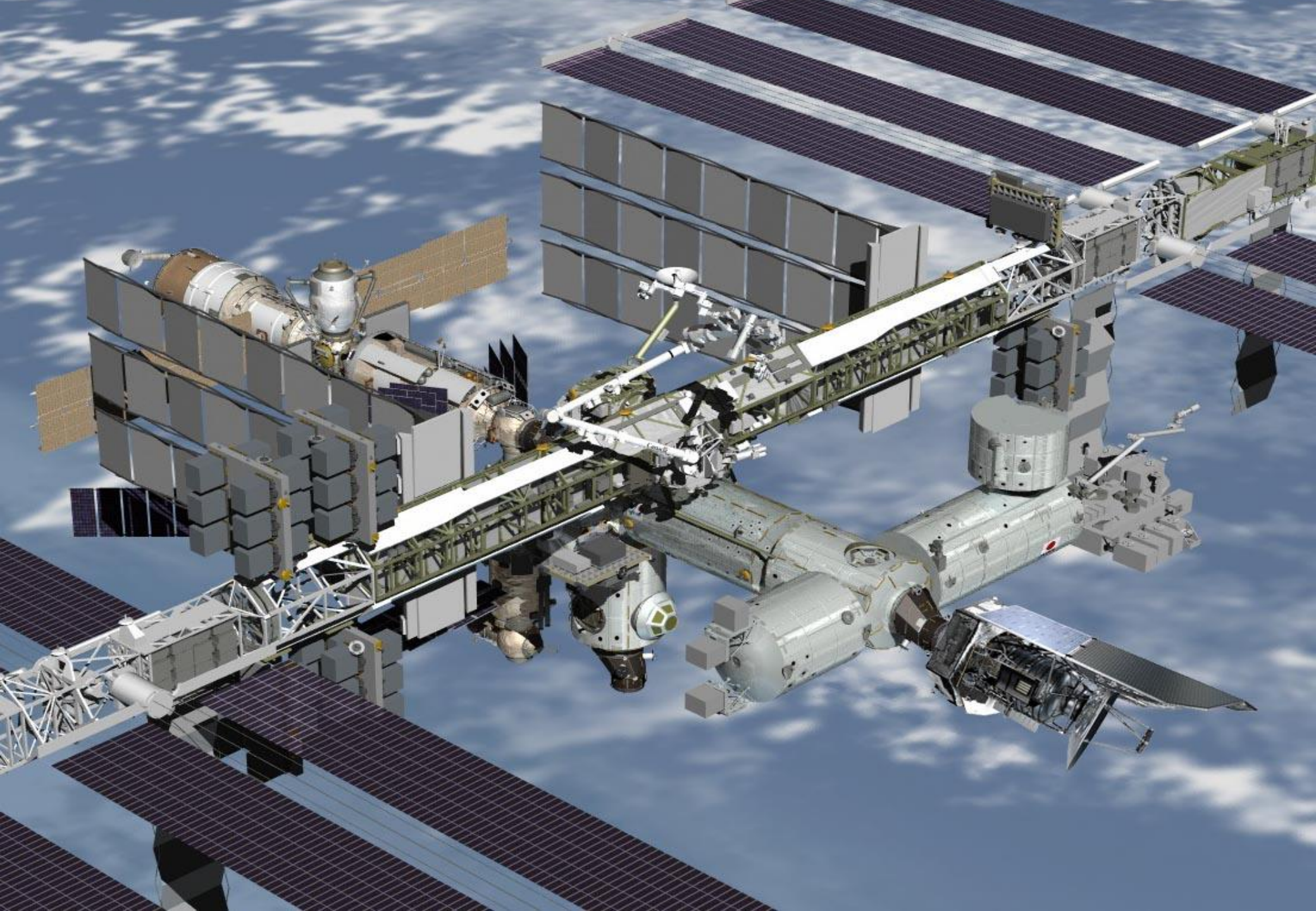

THANK YOU!

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