Update on the state of GEO hosted payloads

Doreen Neil

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Why does hosting matter to the GEO-CAPE community?

1. TEMPO

And also, MAIA (LEO) and GEO-CARB (GEO).

And also, EVI-5.

And also, NASA's approach to future missions.

Quick Status of NASA commercially hosted payloads

- **TEMPO**: host solicitation release May 2018 with host selection by February 2019.
- **MAIA**: host solicitation release May 2018 with host selection by January, 2019.
- **GEO-CARB**: Study contract with host; targeting actual hosting contract near CDR (mid 2019).
- **GOLD**: Launched on January 25, 2018; Science operations start ~ mid-October, 2018.
- **Atomic Clock**: integrated on a Surrey satellite; launch on the Falcon Heavy, June 2018.

NASA: hosted payload innovator

	TEMPO	MAIA	GEO CARB	GOLD	Atomic Clock
Orbit	GEO	LEO	GEO	GEO	LEO
Payload Sponsor	Earth	Earth	Earth	Heliophysics	Space Tech
Host contract held by:	U.S. Air Force (HoPS)	Program office (ESSP)	PI	PI	Program office (STP)
Project stage at host acquisition	Instrument complete (2018)	Before CDR	Before CDR (mid 2019)	At project start	After CDR
Current state of host acquisition	Waiting for project milestone	Waiting for project milestone	Study contract	On orbit (launched 1/25/2018)	Integrated for launch; launch planned for June 2018

GAO Study: Hosted Satellite Payloads (102187)

- US Government Accountability Office (GAO) has been conducting an analysis of hosted payload use by DoD.
  - Discussions with NASA about NASA's experience with commercial hosting.
  - GAO report likely to be released FY18.

- Draft findings largely in line with GEO-CAPE experience:
  - Benefits of increased affordability, increased resilience from disaggregation, continuous technology upgrades and industrial base stability
  - Concerns for DOD's ability to mitigate logistical challenges (matching payloads with hosts), maintain payload control and security, and accurately estimate the benefits of using a hosted payload approach.

- Draft Appendix includes this statement:
  "NASA officials said that for these missions, hosting the payload on a commercial satellite allowed them to meet their objectives for science at a better cost than if they had provided the satellites themselves."

NASA's approach to future missions

Types of Missions Solicited Under EVC

- ESAS envisioned EVC to be similar to the EVM strand, including full mission implementation costs whether for instruments, spacecraft, and launch vehicles OR hosted payloads with hosting services included.

- While the ESAS references EVM, ESD will exercise flexibility to implement any of the following arrangements for EVC:
  - Full mission implementation – like CYGNSS
  - PI arranged instrument hosting – like GeoCarb
  - NASA provided hosting for a MOO – like TEMPO or MAIA

- ESD may solicit ALL of these implementations in a single AO, as follows:
  - $ xxxx M for full mission or PI arranged hosting
  - $ xxxx M-$ xxxx M for MOO; with $xxxx M-$xxxx M for accommodations

Thank you.

How we got here

- 2013 NASA funds **accommodation feasibility studies** for TEMPO using US Air Force HoPS contract.
- 2013 **Changed National Space Transportation Policy**

  "United States Government payloads shall be launched on vehicles manufactured in the United States unless an exemption is coordinated by the Assistant to the President and National Security Advisor and the Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy through an interagency process…**such an exemption is not required** for United States Government use of foreign launch vehicles to support:

  Hosted payload arrangements on spacecraft not owned by the United States Government."
- 2010 Changed **National Space Policy of the United States**

  "Departments and agencies shall:

  Work jointly to acquire space launch services and **hosted payload arrangements** that are reliable, responsive to United States Government needs, and cost-effective."
- 2006 **Air Quality Remote Sensing From Space Meeting** prepared first Decadal Survey input. (doi: 10.1029/2006EO330005)
- 1997 Jack Fishman's "**GEOstationary TROpospheric Pollution SATellite**" selected for Step 2 (doi: 10.1117/12.298116); team discusses hosting at LM Satellite User's Conference.

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