VO Visibility/Planning Protocols

ObsLocTap v0.5 — http://www.ivoa.net/documents/ObsLocTAP/20190909/index.html
ObsVisSAP v0.5 — http://www.ivoa.net/documents/ObjVisSAP/20190319/index.html
3 important definitions

1) Service (Observatories implement)
2) Client (Users of services … tool does something with service)
3) Use case

Visibility Service:

How useful is the pure geometrical visibility if it does not guarantee schedulability?

- Perhaps useful to include **fidelity** as an optional parameter
- However, service must be reliable, otherwise not used
- Public visibility tools less accurate than internal ones

Chandra: Access to internal constraint checkers not trivial, need to work with schedulers who are very busy

Combine ObsVisSAP, ObsLocTAP
Also information about when **not** possible can be of value
Human intervention still needed but can be made much more efficient

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Some Use Cases:

Long-term Scheduling: Coordinated observations (see talk by JU Ness)

Short term Scheduling:

1) Coordinated **TOO**
   Find out who does what and adapt own strategies (simultaneous, complementary)
   Need to define roles (Lead, follow), not only by scientific importance but but degree of constraints
2) Maximize scientific use of observatories time by exposing plans to the community:
   Followup observations, e.g., small, flexible telescopes jump on schedules of larger ones
   Spontaneously fill gaps in coordinated campaigns (like observations in filters not done by anyone else)
   Individuals with complementary data can contribute to larger collaborations

Although advantages are seen:

- For many Ground-based observatories: policy of **proprietary Schedules**
- No advance schedules, only pool of observations for a night with ad-hoc scheduling
  Reason: avoid being scooped by other observers => No ObsLocTAP but ObsTAP (past)

But visibility service would be useful for ground-based observatories

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Implementation

ESA missions have **developed**, **implemented** and **documented** to best knowledge
Chandra has implemented **independently**

=> Now need to exchange experiences and get more on board

To consolidate guidelines, need Guinea pigs: Try whether following guidelines lead to success
Fix weaknesses (expected feedback from XMM, HST)

First ObsLocTAP guideline at:
https://www.cosmos.esa.int/web/vovisobs_protocols/obsloctapimplguide

Visibility protocol guideline ongoing
Not much to say, though, because biggest part is the computation of visibility and decision on structure (e.g. ad-hoc calculation, tabulation)

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Misc:

Does the standard work for both pointed and survey missions ?
=> They are designed so

Might it be useful to collect statistics to measure the use/science achieved.
How do we measure success? - Measure of how it is used & report back to observatories
- What is the benefit of keeping the services up to date;
- May be good to be considered up front.

Question outside the meet up?? How are the services discoverable?? — Thru the VO Registry??

Answer: A section on ObsLocTAP v0.5 describes how to publish the services on the VO Registry (written by registry experts). A similar one will appear on the visibility protocol so clients will discover the services dynamically

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HST:

. Visibility for HST is limited due to Low Earth Orbit
  - The user of the service would know which day an object is visible but not which orbit of which day

. => A creation date of ephemeris as output parameters allows clients to Estimate precision of longer-term information

. JWST will be better - high Earth

. Visibility check between HST & XMM may be - What cannot be done??

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Chandra

. Mission planning for Chandra very complicated.
. Chandra prototype - implemented a proposal planning tool for visibility
with a one year predictive ephemeris
. Science Mission planning for Chandra includes many additional complexities
(like pitch angle constraints, thermal constraints, off nominal roll constraints)
. Thermal constraints in particular depend on the immediate past time-history of
spacecraft pitch and can only be determined when the week is being scheduled

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Optical telescopes

. Noted that lasers play a role at some observatories
. Schedule stay proprietary until performed
. The PI owns a block of time that may change due to weather or instrument downtime
. Long-term plans don’t really exist, observations are performed from a pool depending on sky conditions