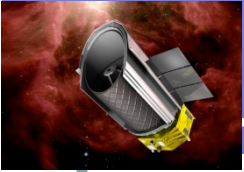


FPI International Review & Decision Procedure

SPiCA Science Workshop
16th – 17th Dec. 2010 @ NAOJ

H. Matsuhara &
JAXA & ESA SPiCA pre-project team



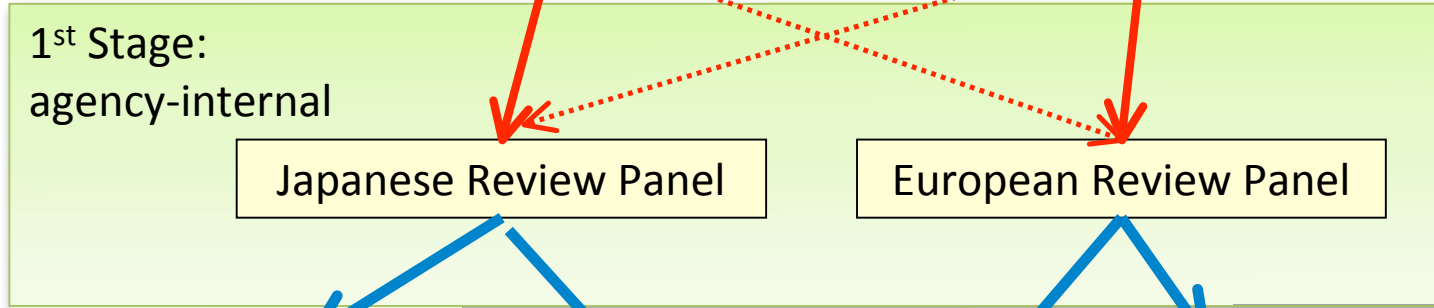
Background & Scope

- SPiCA is an International Mission
 - Japanese-led mission with significant contribution from ESA and a European consortium, and Korea.
 - US participations is also being discussed
 - The composition of SPiCA Focal Plane Instrument (FPI) assembly (hereafter FPIA) shall be determined based on international discussions and the agreement among the participating institutes.
- Aim to go to the next phase from FY2012
 - System Definition Review (SDR) in mid-2011
 - Project Phase-up review in late FY2011
 - **Decision of onboard FPIA before the SDR is mandatory**

Updated 14th
Dec. 2010

Japanese/Korean
Input Data Package

European Input
Data Package

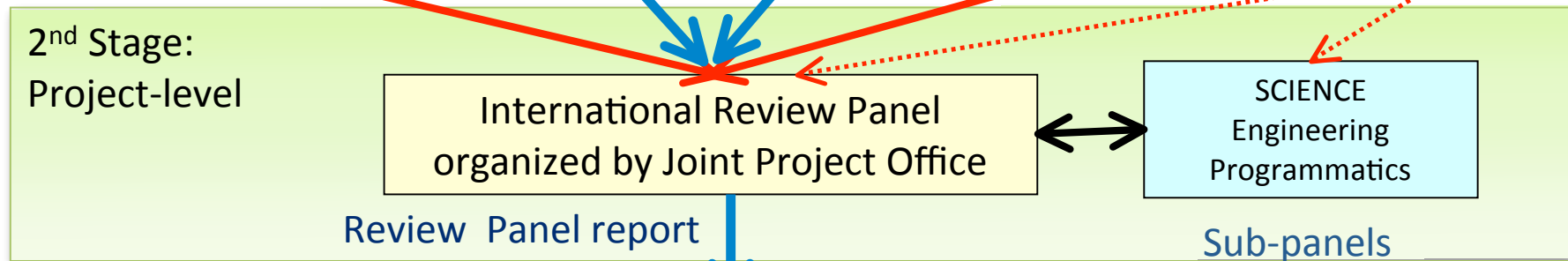


Update Japanese /Korean
Data Package

Review report

Update European
Data Package

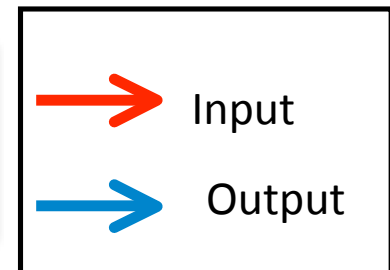
US Input Data
Package (tbc)



Review Panel report

Sub-panels

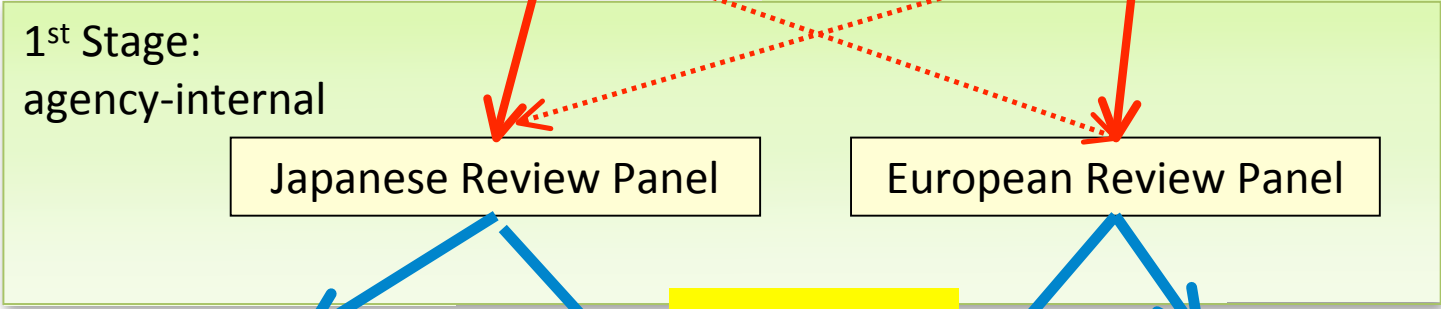
Updated Data Package (incl. review report by JPO)



Updated 14th
Dec. 2010

Japanese/Korean
Input Data Package

European Input
Data Package

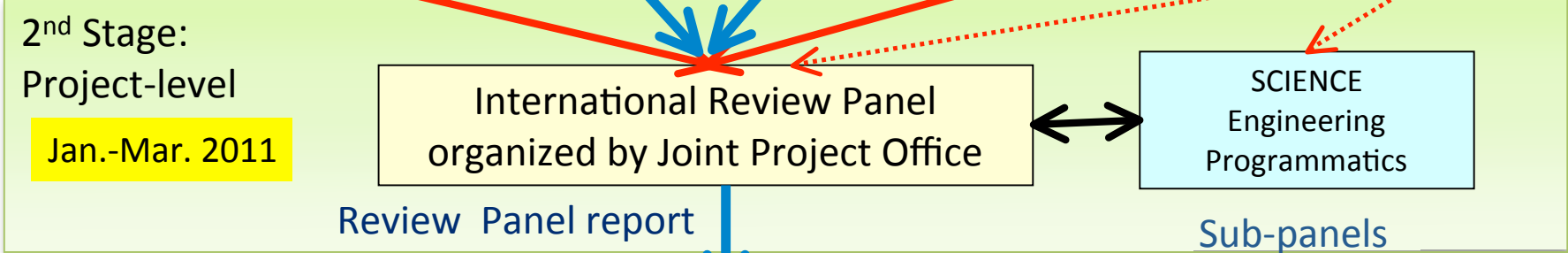


Update Japanese /Korean
Data Package

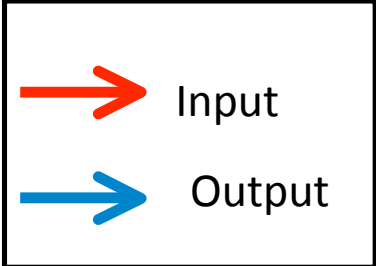
End Dec. 2010
Review report

Update European
Data Package

US Input Data
Package (tbc)



Updated Data Package (incl. review report by JPO)





Issues addressed in the reviews

1. Consistency with scientific objectives
 - Scientific objectives are given in the Mission Requirement Document & ESA Yellow Book
2. Technical feasibility
3. Demonstrated maturity of the design concept
4. Consistency with system-level resources
 - eg. compliance with ICS-FPI
5. Clarity in risk identification and mitigation
6. Validity of design development, Assembly, Integration & Verification (AIV) plans and compatibility with the instrument and system schedule

Mission Requirement Document (JAXA)

Assessment Study Report (ESA Yellow Book)

Sec.2.2 Resolution of Birth and Evolution of Galaxies

#1	Probing the High-Redshift Universe toward the Epoch of Reionization
#2	Origin of Cosmic IR Background
#3	Metallicity Evolution of Evolving Galaxies Revealed with SPICA
#4	Supermassive Black Hole Mass Growth History
#5	Cosmic Star-Formation & Mass Assembly History

1.5 Galaxy evolution

- | |
|---|
| 1.5.1 Major recent discoveries and open problems |
| 1.5.2 MIR/FIR imaging spectroscopy is the key observational technique |

1.6 The role of SPICA-SAFARI

- | |
|--|
| 1.6.1 Spectroscopic cosmological surveys with SAFARI |
| 1.6.2 Deep cosmological surveys with SAFARI |
| 1.8 Discovery Science with SPICA |

Sec.2.3 Life Cycle of Interstellar Dust

#1	Study of Dust-forming Supernovae
#2	Dust and Molecular Shells around Low- and Intermediate-mass Stars
#3	Dust formation and grain growth in Dense Molecular Clouds
#4	Study of Supernovae Remnants
#5	Interstellar Medium in Nearby Galaxies
#6	Imaging and Spectroscopic Survey of Galactic Plane

1.4 The life cycle of gas and dust

Sec.2.4 Studies of Exoplanets and Solar Systems

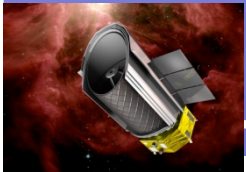
#1	Direct Detection and Characterization of Exoplanets
#2	Dissipation of Gas from Proto-planetary Disks
#3	Debris Disk Surveys
#4	Role of Ice for Planet Formation
#5	Survey of Primordial Objects in the Solar System

1.2 Planetary systems formation and evolution

- | |
|---|
| 1.2.1 Protoplanetary and debris discs |
| 1.2.2 The inner and outer Solar System "our own debris" |

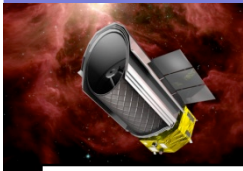
1.3 Exoplanet characterisation in the Infrared

- | |
|---|
| 1.3.1 New frontiers in exoplanet research |
| 1.3.2 Mid-infrared coronagraphy: "Direct" imaging and spectroscopy of EPs |
| 1.3.3 Mid-IR "transit" photometry and spectroscopy of exoplanets |



Issues addressed in the reviews

1. Consistency with scientific objectives
 - Scientific objectives are given in the Mission Requirement Document & ESA Yellow Book
2. Technical feasibility
3. Demonstrated maturity of the design concept
4. Consistency with system-level resources
 - eg. compliance with ICS-FPI
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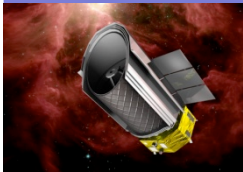
Cold Mass Allocation to FPIA

Plan B is current baseline

Instruments	Cold mass allocation		
	Plan A	Plan B	Plan C
MIRXXXX	65.0	45	65.0
SCI	30.0	20.0	0
FPC-G & -S	12.0	12.0	12.0
SAFARI	50.0	50.0	50.0
US Instrument	0	30.0	30.0
IOB	88.0	88.0	88.0
IOBA(excl. IOB)	17.0	17.0	17.0
Total	262.0	262.0	262.0

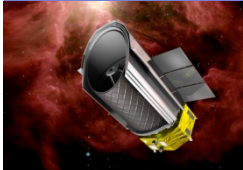
- Cold mass (see left)
 - Mass of the whole FPIs (incl. optional ones) is 157kg max.

Margins are included
20% for FPIs
10% for IOBA



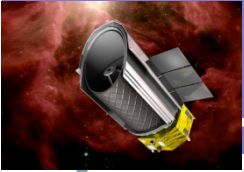
'Agency-Internal' Review (by now..) (1/2)

- European-led instrument (SAFARI)
 - Oct. 2010: Science Verification Review
 - Panels:
 - Chair: Gerald Crone (SPiCA study manager); Co-chair: Kate Isaak (SPiCA study scientist);
 - Secretary: Astrid Heske (SPiCA SAFARI instrument interfaces);
 - ISAS/JAXA: Takao Nakagawa (SPiCA program and schedule); Hideo Matsuhara (FPI suite interfaces and AIV); Mitsunobu Kawada (spacecraft interfaces, bus and data handling)
 - ESA Science: Jean Clavel (Astrophysics mission science program) , Göran Pilbratt (Herschel project scientist);
 - ESA Engineering: Mark Berrill (mechanical system, structures) , Dominic Doyle (optical system and telescope assembly); Massimo Falcolini (product/quality assurance); Luitjens Popken (detector and system engineering); Thierry Tirolien (thermal/cryo system)
 - Final board report : draft prepared, finally released by end. Dec., 2010



'Agency-Internal' Review (by now..) (2/2)

- Japanese-lead & Korean-lead instruments:
 - Panels:
 - Chair: Takashi Ichikawa (Tohoku Univ.)
 - SPiCA task force for Group of Optical and Infrared Astronomers (GOPIRA): Takashi Ichikawa (Tohoku Univ.), Hideyuki Izumiura, Masatoshi Imanishi, Motohide Tamura, Takuya Yamashita, Jun-ichi Watanabe (NAOJ), Kimiaki Kawara, Kotaro Kohno, Tomoki Saito (Univ. Tokyo), Michihiro Takami (ASIAA),
 - Other members:
 - Hiroshi Shibai (Osaka Univ.), Takashi Onaka, Masahiko Hayashi, Satoshi Yamamoto (Univ. Tokyo), Toru Yamada (Tohoku Univ.), Shigeru Ida (Titech), Takao Nakagawa, Hiroshi Murakami (ISAS, JAXA)
 - Timeline:
 - End April, 2010: 1st Instrument Proposals (MIRACLE, MIRMES, MIRHES, SCI, FPC) submitted
 - July 2010: recommendation by a Japanese panels(1st round):
 - Three MIR instruments are merged (to 'MCS')
 - Substantial revisions made for SCI
 - 30th Sep. 2010: 2nd Instrument Proposals (MCS, SCI, FPC) submitted
 - mid- Nov. 2010: 2nd round review report released
 - 29th Nov. 2010: 3rd Instrument Proposals submitted, now available on the Web.

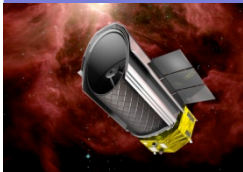


This Workshop

- Purpose of the workshop
 - to discuss the scientific importance of the **proposed instruments**. *Presentation of 'wish list' is not adequate.*
 - Please keep in mind which function(s) of the instrument must be required to achieve the scientific goal.
- Wrap-up of 'the 1st-stage review'
 - Based on the presentations & discussions in this workshop, the 1st stage panel will prepare the final 'panel recommendation report' by the end of December.

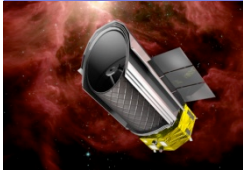


BACKUP SLIDES



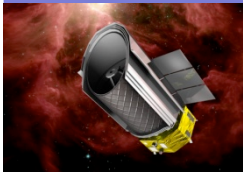
International Review Procedure (1)

- Agency Internal Review(after WS):
 - Japanese domestic workshop on SPiCA science will be held in 16-17th December, 2010
 - Final review board report on their own data package : end of Dec.
 - in the end of December: formal distribution of the whole data packages (incl. review panel reports) to Europe & Japan (and possibly US) panel members.
- US participation:
 - No formal commitment of NASA is foreseen by Feb. 2011 because of the availability of FY 2012 budget of NASA.
 - By the time of decision, the selection process of the US instrument need to be paused.
 - However, it is agreed that some US scientists will contribute as members of the Science sub-panels in the 2nd Stage review in the volunteer manner (to be confirmed soon)



ToC of Japanese 1st Stage Panel Report (preliminary)

- 市川コメント
 - 最終レポートはプリプロジェクトチームの名でまとめるのか、STFとの共著でまとめるのかによって性格がだいぶ異なったものになるかと思います。
 - 共著の場合には、
 - 1. 審査の経緯(1頁)
 - 2. 最終提案書による各装置の概要(各装置1頁程度)
 - 3. 評価(各装置1-2頁程度)
 - 期待されるサイエンス 機能の優先順位 課題
 - 4. 装置の最終提案(1頁)
 - appendix 装置提案書(WSの議論を踏まえて最終改訂)
- を考えています。まずsub委員会でまとめて、STFとプリプロジェクトチームに展開する手順ではいかがでしょうか。国際審査はプリプロジェクトチームがリーダーシップを取る必要があるかと思います。そのために、上記の最終レポートをベースに国際審査に展開するための形に整理してもよいかもしれません。



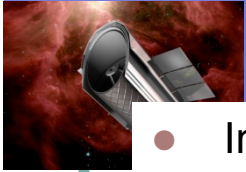
International Review Procedure (2)

- inter-agency project-level review
 - International Review Panels are organized by Joint-Project Office(JPO)
 - JPO will organize the review meeting and the members of sub-panels.
 - sub-panel meetings will be held in Jan - Feb.
 - the wrap-up panel meeting (including presentations) in March
 - review panel report : end of March 2011
- inter-agency executive committee
 - Briefing the interagency executive committee in April
 - April - May 2011 → formal decision of the FPI composition



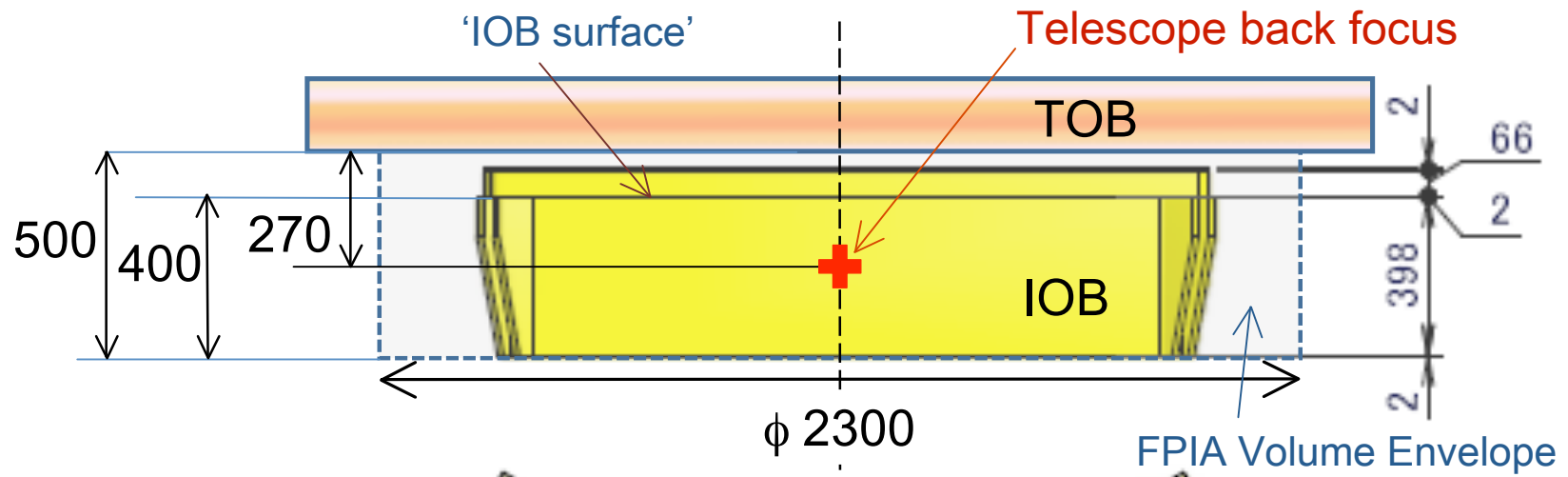
2nd Stage: input data packages (proposed)

- Japanese/Korean
 - A. Science Targets
 - **Mission Requirement Document [AD-1]**
 - B. Resource Allocation
 - **ICS-FPI [AD-4] and ICS-FPC [AD-6]**
 - C. Instrument Proposal
 - D. Design Maturity:
 - **Assessment in the Japanese 1st stage review panel report**
- European
 - A. Science Targets
 - **SRON-SAFARI-SP-2010-007 0.3 (Science Requirements Document)**
 - New document containing science case, based on Yellow Book
 - B. Resource Allocation
 - **(currently contained in:) JAXA-SPiCA-SYS-ICS-0003 0.2 (ICS-SAFARI)**
 - C. Instrument Proposal: (numbering correspond to that shown above)
 - 1. (see SRD)
 - 2. **SRON-SAFARI-SP-2009-001 0.6 (Instrument Specification)**
 - 3. **SAF-RAL-REP-0038 1.1 (Phase A Study Report)**
 - 4. (see ICS SAFARI)
 - 5. **TopLevelPlan-V3 + SRON-G/AIV/PL/2010-03 draft 1 (AIV Plan)**
 - 6. **SRON-SAFARI-PL-2010- d1 (Science Implementation Plan)**
 - 7. **TopLevelPlan-V3**
 - D. Design Maturity:
 - Assessment in the **SAFARI SVR/IRR Board Report**



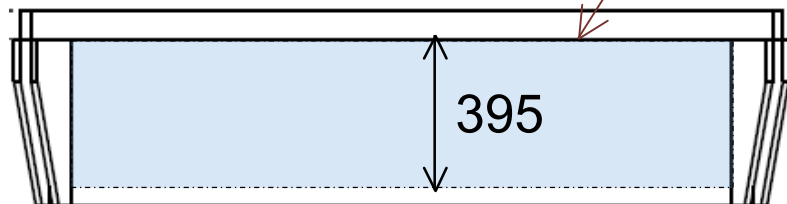
Toc of 2nd Stage Panel Report (preliminary, by Gerry Crone)

- Introduction
 - Including recall of review steps and executive summary of the outcome from stage-1 reviews (not technical, but when held, duration, etc.)
- Review Objectives
- Review Panel composition
- Proceedings of the Review
 - 5.1) Summary of documents reviewed
 - 5.2) Summary or Panel meeting proceedings, Record of meetings held etc.
 - 5.3) Summary of Board Meeting Proceedings
- Board Findings
 - 6.1) Overview
 - 6.2) Science, Including Compliance with Science Objectives, Science Observing Plan
 - 6.3) Instrument design (Overall design, Detector systems, Optics, etc.)
 - 6.4) Interfaces (Spacecraft resources versus instrument requirements)
 - 6.5) AIT/AIV 6.6) Development and verification plans
 - 6.7) On Board Software ? 6.8) Management, PA ?
- 7. Assessment against Objectives
- 8. Board Recommendations
- 9. Board Conclusions
- ANNEX 1
 - Report from Sub-panels



Note: the Height of the envelope is now 395mm (neither 398 nor 400) to make a gap between FPIs and the top cover

Allowed Height for FPIs: 'IOB surface'



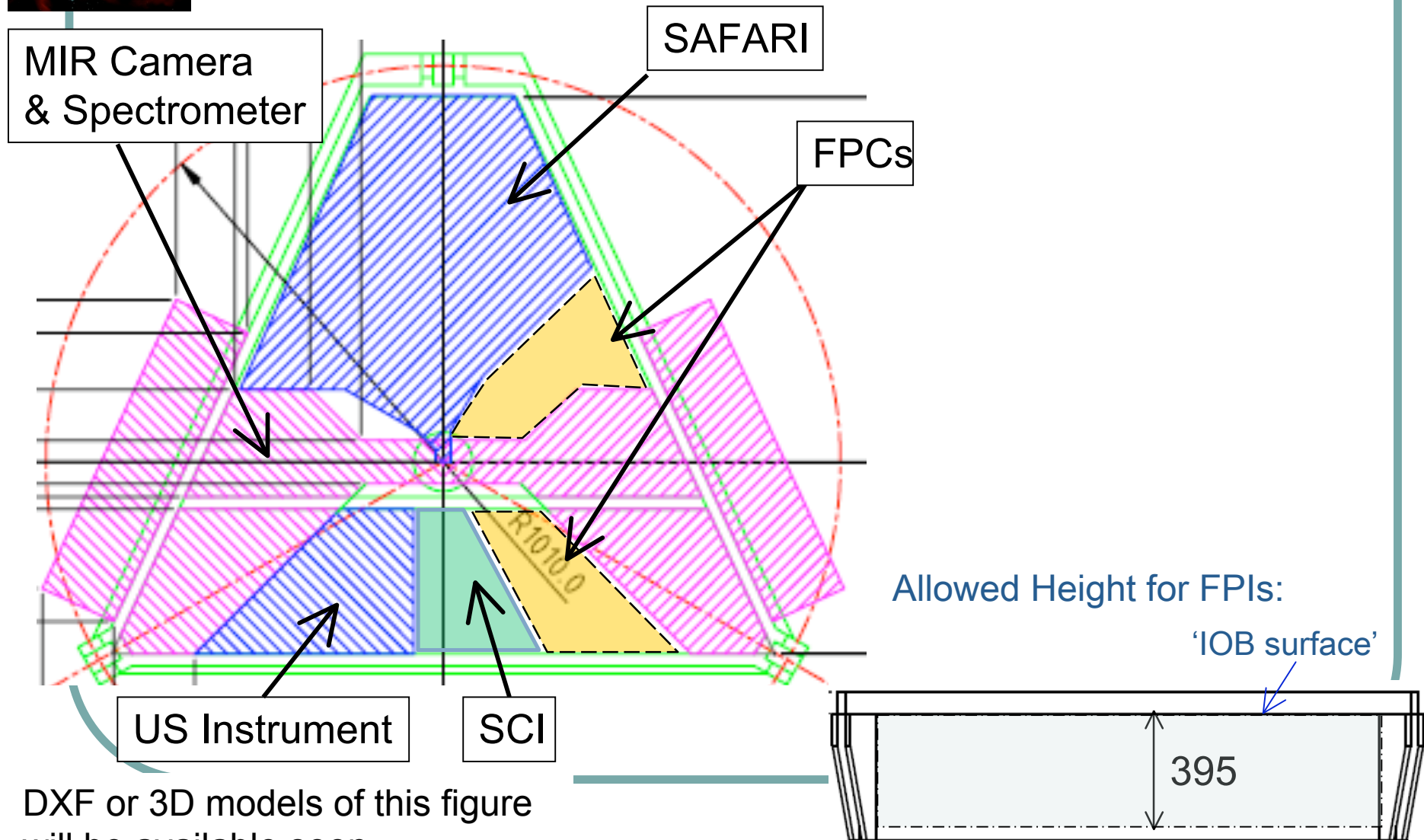
Definition of FPIA Volume

Unit: mm
Updated 25th Nov. 2010



(c) cold volume envelope allocation for FPIs

seen from the telescope side



DXF or 3D models of this figure will be available soon