Bandi ESA Intended Invitation To Tender (ITT): disamina di un caso.

AREMBES: ATHENA **R**adiation **E**nvironment **M**odels and x-ray **B**ackground **E**ffects **S**imulators

INAF Sede Centrale, 6-Aprile-2017

Claudio Macculi

Outline

- How ESA programmes are divided: CTP vs TRL
- Request for a TDA
- EMITS website:
  - How is it structured?
  - Docs to be downloaded
  - Timing
- Info on the AREMBES proposal/project
  - scientific context
  - management/planning
  - products

ESA Programmes: how they work?

https://indico.esa.int/indico/event/81/material/slides/16.pdf

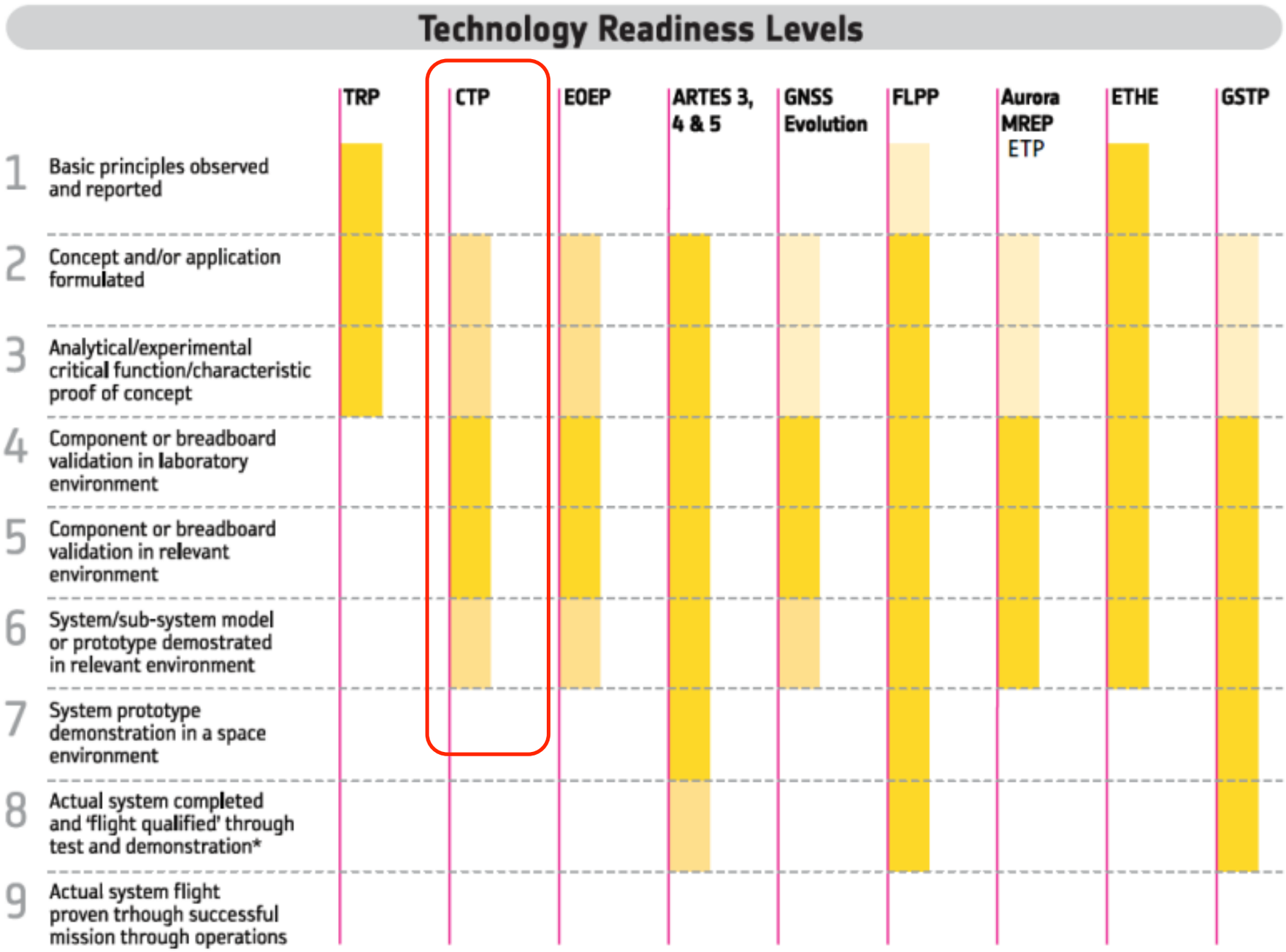
Mandatory Programmes:

- Science Core Technology Programme (CTP)
- Basic Technology Research Programme (TRP)
- Etc….

- Generic
- Application specific

Optional Programmes:

- General Support Technology Programme (GSTP)
- Etc…(Future Launchers Preparatory Programme, Mars Robotic Exploration)



http://www.esa.int/Our_Activities/Space_Engineering_Technology/Science_Core_Technology_Programme_CTP

Whilst the initial stages of new technology development, leading up to experimental verification, are pursued through ESA's Basic Technological Research Programme (TRP), the CTP exists to take these new technologies and apply them to the specific technical requirements of future science missions. CTP funded activity carries them to higher stages of technological maturity, up to full-scale engineering models fully tested in relevant environmental conditions, ready for inclusion in the definition stage of the mission – which is the design phase which guides the actual spacecraft construction.

CTP: science Core Technology Programme

How to participate:

CTP proposals are issued continuously throughout the year on **ESA's EMITS website**, available to all European firms on a 100 percent funding basis. In some cases small to medium sized enterprises (SMEs) are favoured as subcontractors to primes → **OPEN COMPETITION**

How to «request» for a Technological Development Activity (TDA that ESA will insert in the TDP): one of the possible option…

As we have seen, ESA put in place the CTP to be sure that a mission will fly compliant with its requirements (e.g., for ATHENA before the adoption due to an «early» request of TRL5 wrt usual standard) → ESA has the interest in flying satellites that fulfill the requirements, and in the context of the CTP can provide resources for helping this process (understanding of critical issues, to be solved). It is an interest of the consortium to transfer to ESA the message that could be present tech issues (i.e., critical) to be solved:

1) It is fundamental to convince ESA on the **importance of the problem** to be solved in the context of the mission requirements
2) If the **necessary skills** are present in the consortium (inside the team), it is also important to inform ESA that the consortium is able to solve for these issues
3) Provide to ESA from a formal point of view a **brief doc having a description of the problem, expected costs**, etc….
4) IF 1) + 2) +3) are ok, ESA will emit a dedicated tender, not necessarily «tailored» to your scientific issues (in my understanding they try to satisfy also other products they already have)

EUROPEAN SPACE AGENCY - SCIENCE PROGRAMME

TECHNOLOGY DEVELOPMENT PLAN

PROGRAMME OF WORK FOR 2017 AND RELATED PROCUREMENT PLAN

Publication date: 06 December 2016

This document is provided for information only and is subject to future updates.

http://sci.esa.int/science-e/www/object/doc.cfm?fobjectid=47730

EUROPEAN SPACE AGENCY

INDUSTRIAL POLICY COMMITTEE

Science Programme
Technology Development Plan
Programme of Work for 2017 and Related Procurement Plan

SUMMARY

This document presents the activities in the Basic Technology Research Programme (TRP) and in the Science Core Technology Programme (CTP) supporting the implementation of ESA's Science Programme. The national initiatives activities of relevance to the Science programme are provided for information.

REQUIRED ACTION

IPC is invited to approve this CTP/TRP work plan for the year 2017 and the connected procurement proposals and take note of activities envisaged for 2018, included for information.

VOTING RIGHTS AND MAJORITY REQUIRED

Simple majority of member States, present and voting.

EMITS: Electronic Mailing Invitation to Tender System (since mid 1980's). http://emits.sso.esa.int/emits/owa/emits.main

esa emits

ENTITIES | LOGIN | ESA Home Page | Industry Information | Entity Registration | Service Desk | Help

User: Guest

- News
- Procurement Review Board Announce
- Open Invitations to Tender
- Intended Invitations to Tender
- Reference Documentation
- ECOS Resources
- How to do Business with ESA

emits

→ INVITATIONS TO TENDER PUBLISHED

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- Procurement Review Board Announce
- Open Invitations to Tender
  - Ordered by Open Date
  - Ordered by Closing Date
  - By Keyword
  - Global List
- Intended Invitations to Tender
- Reference Documentation
- ECOS Resources
- How to do Business with ESA

ESA Open Invitations To Tender / Global List [FR]

Last Update 27/03/2017,11:49:07 (AO8883: Tender issue)

1	AO8883	CARRIER AGGREGATION IN SATELLITE COMMUNICATION NETWORKS (ARTES AT REF. 3A.076) - EXPRO PLUS (From 27/03/2017 to 12/06/2017 13:00:00, Act.Ref.: 16.1TT.02)
2	AO8854	COPERNICUS DATA AND INFORMATION ACCESS SERVICES OPERATIONS (From 27/01/2017 to 14/04/2017 12:00:00, Act.Ref.: 16.187.05)

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User: Guest

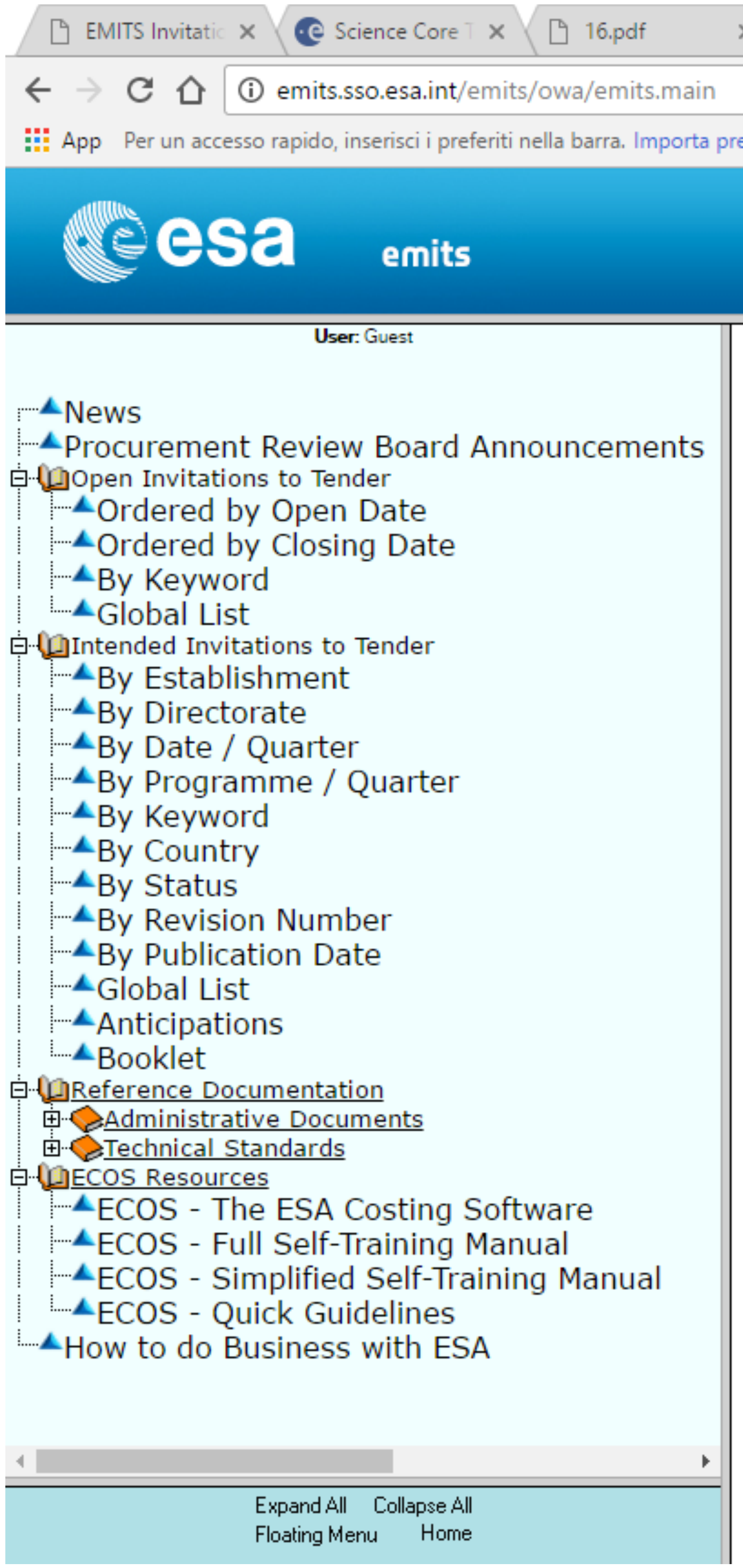
- News
- Procurement Review Board Announce
- Open Invitations to Tender
- Intended Invitations to Tender
  - By Establishment
  - By Directorate
  - By Date / Quarter
  - By Programme / Quarter

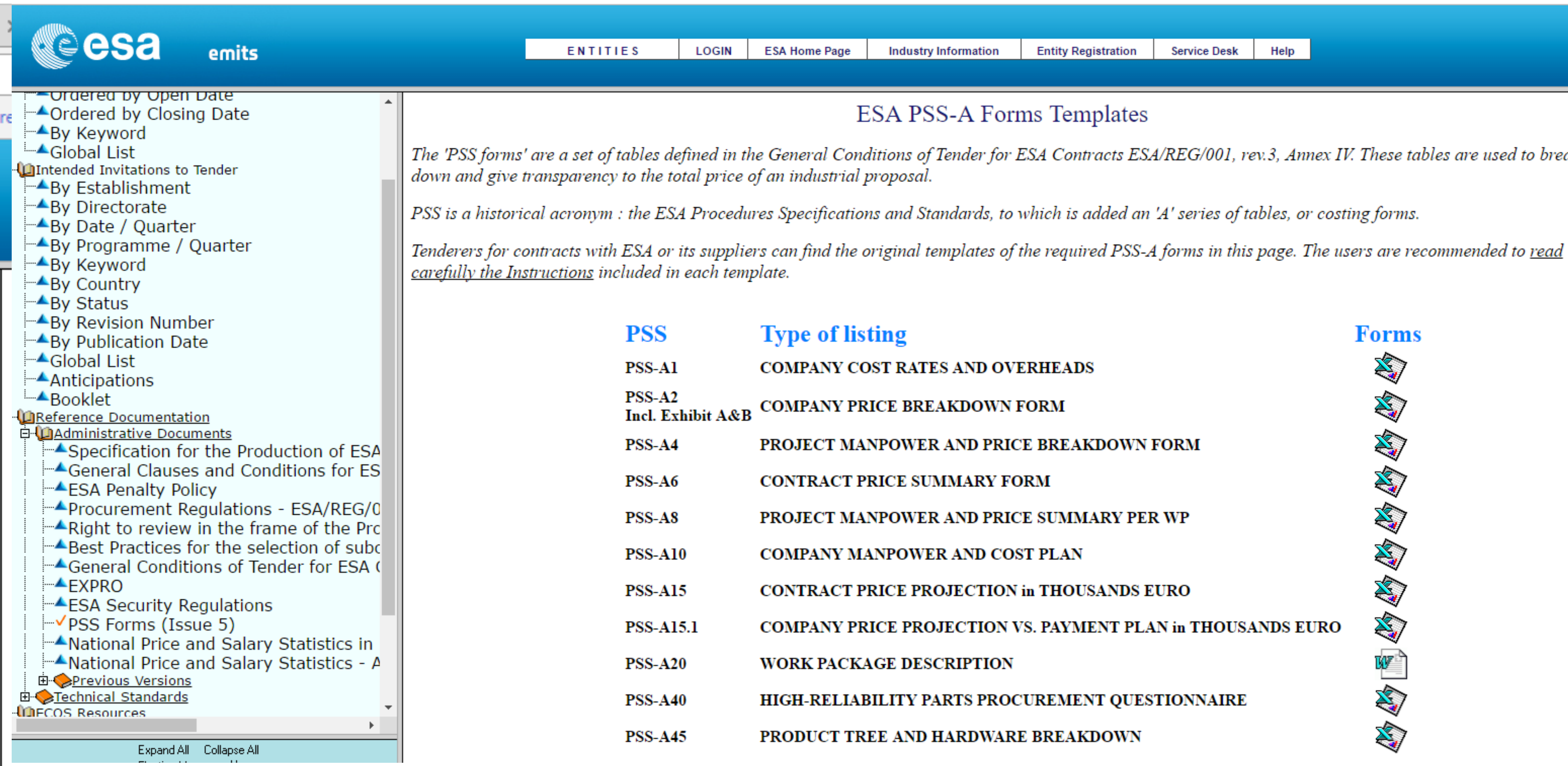
ESA Intended Invitations To Tender / Global List

Total items: 287

1	13.1AA.03	OPEN CALL FOR PROPOSAL FOR ARTES 21 SUB-ELEMENT 2C - SAT-AIS APPLICATIONS & SERVICES INTEGRATED APPLICATIONS PROMOTION PROGRAMME (ISSUED)
2	16.1AA.04	ADS-B FS (AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST) (COMPLETED)

The ESA EMITS website has lot of info….





ESA PSS-A Forms Templates

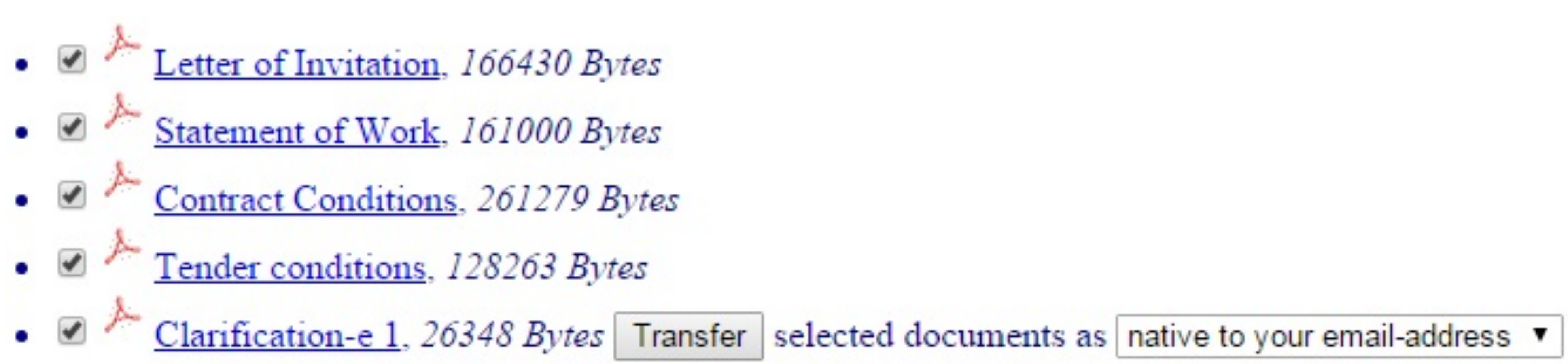
The 'PSS forms' are a set of tables defined in the General Conditions of Tender for ESA Contracts ESA/REG/001, rev.3, Annex IV. These tables are used to break down and give transparency to the total price of an industrial proposal.

PSS is a historical acronym : the ESA Procedures Specifications and Standards, to which is added an 'A' series of tables, or costing forms.

Tenderers for contracts with ESA or its suppliers can find the original templates of the required PSS-A forms in this page. The users are recommended to read carefully the Instructions included in each template.

PSS	Type of listing	Forms
PSS-A1	COMPANY COST RATES AND OVERHEADS	
PSS-A2 Incl. Exhibit A&B	COMPANY PRICE BREAKDOWN FORM	
PSS-A4	PROJECT MANPOWER AND PRICE BREAKDOWN FORM	
PSS-A6	CONTRACT PRICE SUMMARY FORM	
PSS-A8	PROJECT MANPOWER AND PRICE SUMMARY PER WP	
PSS-A10	COMPANY MANPOWER AND COST PLAN	
PSS-A15	CONTRACT PRICE PROJECTION in THOUSANDS EURO	
PSS-A15.1	COMPANY PRICE PROJECTION VS. PAYMENT PLAN in THOUSANDS EURO	
PSS-A20	WORK PACKAGE DESCRIPTION	
PSS-A40	HIGH-RELIABILITY PARTS PROCUREMENT QUESTIONNAIRE	
PSS-A45	PRODUCT TREE AND HARDWARE BREAKDOWN	

Once you are interested in a tender, you have to download the docs by LOGIN → INAF has User Name and Password having in place several contracts. Typically you download 4 docs:



EMITS Invitation To Tende ×

emits.sso.esa.int/emits/owa/emits.mainl

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ENTITIES | ESA Home Page | Industry Information | Your Entity Details | User Preferences | Service Desk | Help | Quit

User: inaf02 - Normal User

- News
- Open Invitations to Tender
- Intended Invitations to Tender
- Reference Documentation
- Software Packages and Links
- Search Invitations to Tender
- Management of Expressions of Interest

Expand All Collapse All
Floating Menu Home

Status: ISSUED
Reference Nr.: 15.164.01
Prog. Ref.: CTP - General
Budget Ref.: E/0401-01B - CTP - General
Special Prov.: BE+DK+FR+DE+IT+NL+ES+SE+CH+GB+IE+AT+NO+FI+PT+GR+LU+CZ+RO+PL
Tender Type: C
Price Range: > 500 KEURO
Establishment: ESTEC
Directorate: Directorate of Science & Robotic Explor.
Department: Future Missions Preparation Office
Contract Officer: Weikert, Beatrice
Last Update Date: 02/06/2015
Update Reason: Loaded a new Clarification(English version)

The radiation background requirements for Athena are demanding and careful analysis will be necessary of background from particles penetrating the pores of the X-ray optics, the action of diverters, and background from secondary interactions in materials close tothe payload. Electrons and low-energy protons propagate via low-angle processes (e.g. Firsov scattering) along the mirror surfaces to the focal plane. Such processes are still today not fully understood. This is combined with the more usual background induced by penetrating incident primary radiation environment and a broad range of secondary particles from the rest of the spacecraft. PreviousX-ray missions (XMM-Newton and Chandra), experienced significant background and those experiences will be analysed in detail, including background sources, environments, exploitation of the XMM EPIC Radition Monitor (ERM) and material & detector (EPIC, RGS) interactions, taking as a starting point the analyses already performed. Based on these experiences, physics models within Geant4 will beimproved and a comprehensive particle and X-ray simulator developed, based where possible on existing prototypes. The tool will bestand-alone, user-friendly and will allow detailed analysis of all of the relevant radiation processes leading to instrument background for the full range of possible environmental scenarios. In addition to the usual radiation sources (solar particle events, galactic cosmic rays), of particular importance for Athena is the interplanetary (L2) low-energy (100s of KeV to few MeV) proton and electron environment. This population is poorly understood and includes electrons emitted from the Jovian magnetosphere. This activity will therefore also analyse data from the L2 SREM radiation monitors on Herschel and Planck and combine these with proton and electronmeasurements from other relevant near-Earth interplanetary spacecraft (including SOHO, ACE, ISEE-3 and Geotail), together with necessary extra- and interpolations over the energy range of interest and other analytical considerations. The local effect of the Earth's magnetotail and its temporal variations will be taken into account. The new model will be implemented in the ESA Space Environments Information System (Spenvis). Procurement Policy: C(3) = Activity restricted to SMEs & R&D Entities. For additional informationplease go to EMITS news "Industrial Policy measures for non-primes, SMEs and R&D entities in ESA programmes".

- Letter of Invitation, *166430 Bytes*
- Statement of Work, *161000 Bytes*
- Contract Conditions, *261279 Bytes*
- Tender conditions, *128263 Bytes*
- Clarification-e 1, *26348 Bytes* Transfer selected documents as native to your email-address

- Letter of Invitation, I
- Statement of Work, I
- Contract Conditions,
- Tender conditions, I

→ Budget, deadline for questions, deadline for proposal submission (CD, hardcopy now on-line submission)

→ How to write the proposal; how it is allocated the budget (% on different Parts); if preliminary work must be presented; BIPR; various tables (Bidding Team and Price Breakdown Information, **Geographical distribution**, Declarations on Compliances, **Evaluation Criteria and Weighting Factors**)

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Appendix 1 to
AO/1-8243/15/NL/BW

DOCUMENT

Science - Cosmic Vision Programme

Athena Radiation Environment Models and X-Ray Background Effects Simulators – Statement of Work

Programme Reference: C204-110EE

Prepared by
Reference ESA-SRE-F-ESTEC-SOW-2015-002
Issue 1
Revision 0
Date of Issue 26/03/2015
Status
Document Type SOW
Distribution

European Space Agency
Agence spatiale européenne

Table of contents:

Contents

Potential bidders are encouraged to post an expression of interest on EMITS (see Expression of interest) in a particular ITT:

1) to be informed of any developments that take place

2) other companies can take these expressions of interest into account when establishing their strategy in replying to an Invitation To Tender.

ENTITIES | ESA Home Page | Industry Information | Your Entity Details | User Preferences | Service Desk | Help | Quit

Preferred role (Prime/Sub)	Entity name	Type of entity	Specialisation Area	Contact Person Telephone Fax Email Address	Address	WEB Site Address	Interest Expressed on IITT	Interest Expressed / Confirmed on AO
Sub	GEANT4 ASSOCIATES INTERNATIONAL LTD (Visibility: Public)	R&D	Yes	JOHN ALLISON Tel:(+44) 871 6627073 Fax:(+44) 7006 0208078 John.Allison@g4ai.org	Registered Office 9 Royd Terrace HX7 7BT Hebden Bridge	http://g4ai.org		28-05-2015
Sub	VIRTUAL ANGLE BV (Visibility: Public)	SME	Yes	Pedro Branco Tel:(+31) -91 8232931 Fax:(+31) -261 471226 pbranco@virtual-angle.net	Dr. Nolenslaan 157, Unit 20 6136 GM 6136 GM Sittard	http://www.virtualangle.com		19-05-2015
Sub	NATIONAL OBSERVATORY OF ATHENS (Visibility: Public) Institute for Space Applications and Remote Sensing	R&D	Yes	Anastasios Anastasiadis Tel:(+30) 210 8109194 Fax:(+30) 210 6138343 anastasi@space.noa.gr	P.O. BOX 20048 - THISSIO GR - 11810 ATHENS	http://www.noa.gr		20-05-2015
Sub	ETAMAX SPACE GMBH (Visibility: Public)	SME	Yes	Karl Dietrich Bunte Tel:(+49-(0)) 531 86668830 Fax:(+49-(0)) 531 86668899 k.bunte@etamax.de	Frankfurter Straße 3 d 38122 Braunschweig	http://www.etamax.de		23-06-2015
Sub	INSTITUTO NACIONAL DE TÉCNICA AEROESPACIAL. INTA (Visibility: Public) Space Programmes& Space Sciences	R&D	Yes	Sergio IBARMIA HUETE Tel:(+34) 91 5206551 Fax:(+34) 91 5202043 ibarmiahsa@inta.es	CRTA DE AJALVIR, KM 4 28850 E 28850 TORREJON DE ARDOZ	http://www.inta.es		16-07-2015
Prime	INAF - NATIONAL INSTITUTE FOR ASTROPHYSICS (Visibility: Public) (*EMITS user:inaf02*) Direzione Scientifica	R&D	Yes	Roberto Della Ceca Tel:(+39) 335 1587514 Fax:(+39) 06 35533359 dellaceca@inaf.it	VIALE DEL PARCO MELLINI 84 00136 ROMA	http://www.inaf.it		16-07-2015
Sub	DH CONSULTANCY BVBA (Visibility: Public)	SME	Yes	Daniel Heynderickx Tel:(+32) 016 225860 Fax:(+32) 0 0 DHConsultancy@skynet.be	Bondgenotenlaan 148/0401 3000 Leuven	http://www.dhconsultancy.net		26-05-2015

Print including Specialisation Area details

Depending on the tender, usually about 2,5 months for submitting the proposal → **AT LEAST 1 month full time for editing**, + understanding of the proposal, setting up the team, funds negotation inside the team, signatures…

For AREMBES ESA has also provided «evaluation criteria»

NO PANIC if you think you are not able to comply with the deadline: you can request for a new one, IF JUSTIFIED!

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Clarification no. 3 to

Invitation to Tender (ITT): **AO/1-8243 /15/NL/BW**
ATHENA Radiation Environment Models and X-ray Background Effects Simulators

10th July 2015

Potential bidders are informed that the deadline for submission of proposals for the above ITT has been extended from 21st August 2015 to:

25th September 2015 at 13.00 hrs.

Appendix 3 to
AO/1-8243/15/NL/BW
Page 23

ANNEX 3 : Evaluation Criteria and Weighting Factors

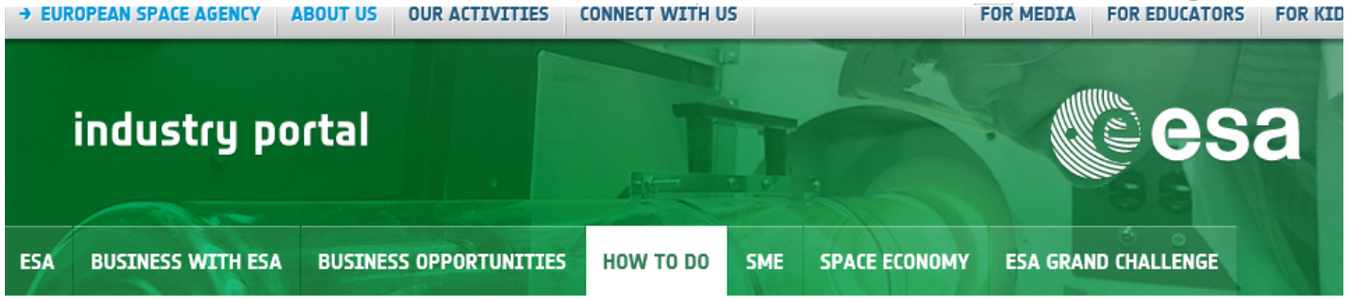
In evaluating the tender(s) ESA will use the following criteria:

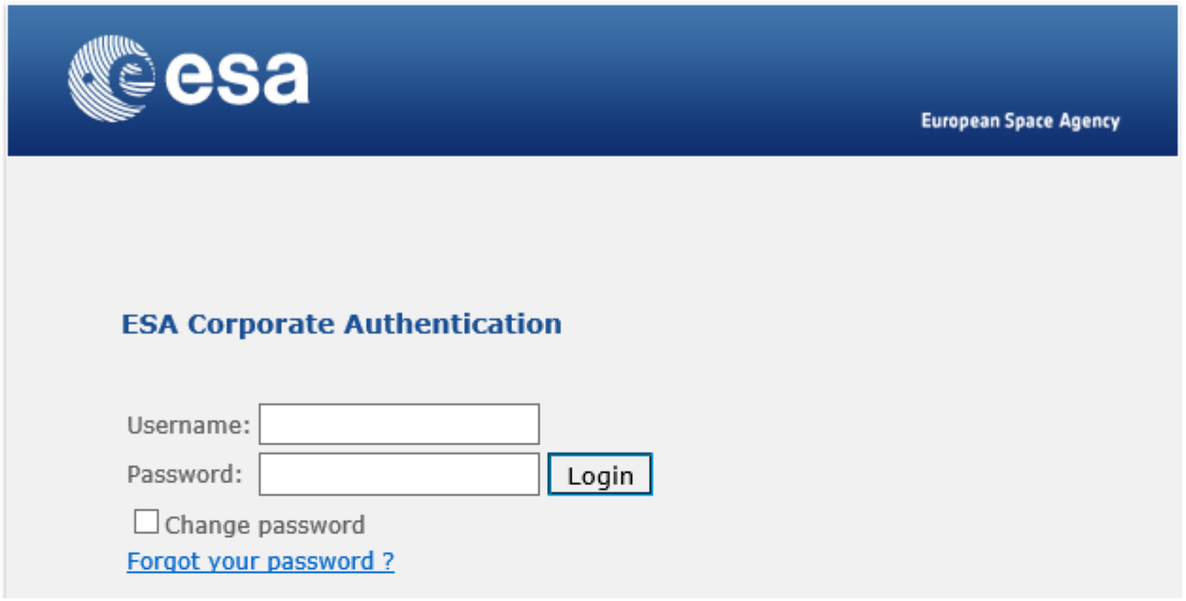
No.	Evaluation Criterion	Weighting Factor
1.	Background and experience (general and related to the particular field concerned) of the company (ies) and staff (including adequacy of proposed facilities)	30%
2.	Understanding of the requirements and objectives and discussion of problem areas	25%
3.	Quality and suitability of proposed programme of work; adequacy of engineering approach	25%
4.	Adequacy of management, costing and planning for the execution of the work	10%
5.	Compliance with administrative tender conditions and acceptance of contract conditions	10%

The cover letter is a brief summary of the full proposal, where it is reported KEY ITEM of:

1) **Technical** → here you also state no/partly/fully compliance wrt the SoW
2) Management
3) Implementation
4) **Financial** → here you report for a Advance Payment (max 15%), if any
5) Contractual
6) **Conclusion** → here you state that you want to discuss with ESA issues, if any, arisen
7) Eligibilty requirements
8) No benefits requirement
9) Bidding team and price breakdown information
10) **Geographical distribution** within the bidding consortium
11) Contact details, Representatives (Tech and Contractual management of each bidder)
12) **Key acceptance factors** → i.e., each is eligible; the bid contains C3 measure (R&D, SME)
13) **Declaration of Compliance** → from the tech, managerial, financial point of view, etc…

Proposal selected → **Negotiation meeting** → now is put in writing the contract→ the PM is invited to register at the ESA-P





ESA > About Us > Business with ESA > How to do

Search here

esa-p suppliers area

Help on esa-p for Suppliers

ESA-P: ESA PORTAL FOR SUPPLIERS

esa-p is the supplier portal for ESA's contractual partners, with the following main features:

- controlled access and visibility on ESA contracts (contractual, invoicing and payment information) to Prime- and Sub-contractors directly paid by ESA;
- submission and approval of electronic invoices and Milestone Achievement Certificates.

Access esa-p

The esa-p system can be accessed via the following link: https://esa-p.sso.esa.int.

Help with esa-p

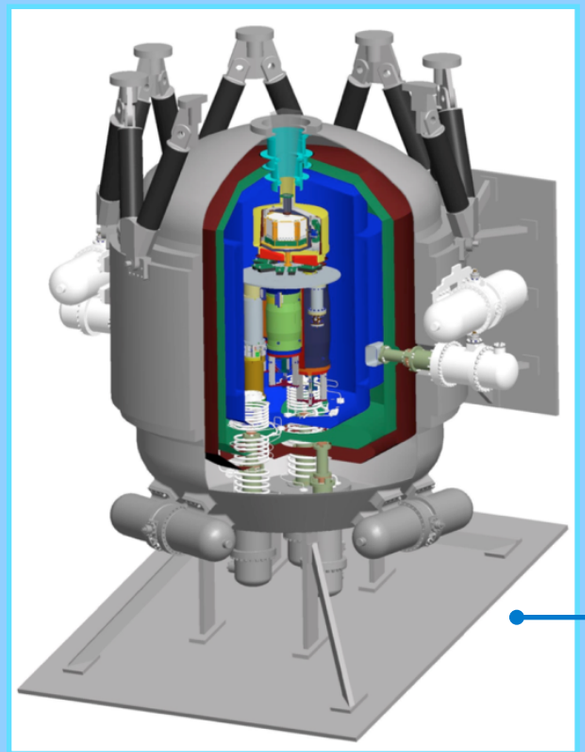
Learn more about esa-p in the online video below.

Payment in 30 days upon received the invoice!

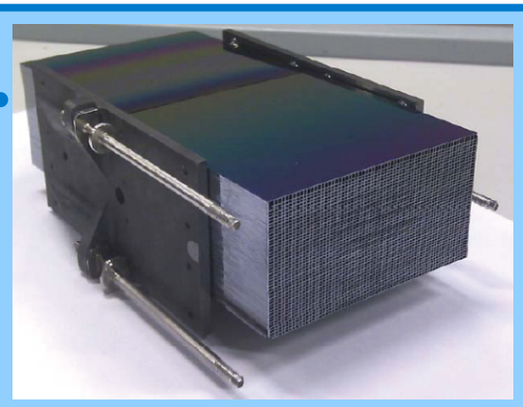
AREMBES in more details…

THE ATHENA OBSERVATORY: 1 TELESCOPE FOR 2 INSTRUMENTS!

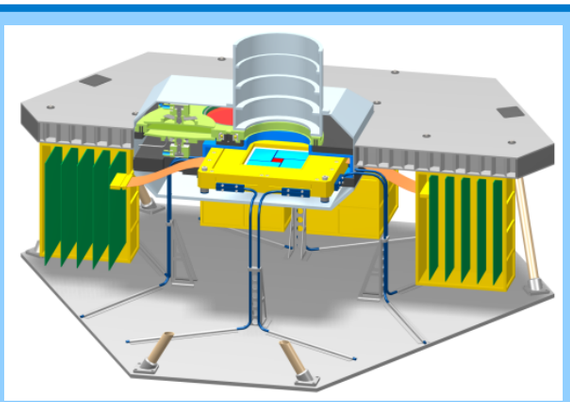
Ariane V (VI ?) class launcher
Satellite mass ~ 5500 kg
Power ~5600 W
Focal length: 12 m
Lifetime: 5 years (10 years)
Nandra et al. 2013 arXiv1306.2307



X-ray Integral Field Unit:
ΔE: 2.5 eV
Field of view: 5 arcmin
Large array of TES cooled at 50 mK
Barret et al. 2013 arXiv:1308.6784



Silicon Pore Optics:
Effective area: 2m^2 @ 1 keV
PSF (HEW): 5''
Willingale et al. 2013 arXiv1308.6785



Wide Field Imager:
ΔE: 125 eV
Field of view: 40' x 40'
Rau et al. 2013 arXiv1307.1709

ATHENA X-IFU:

→ High quality X-ray optics

→ TES camera (thousand's pixels)

At the same time:

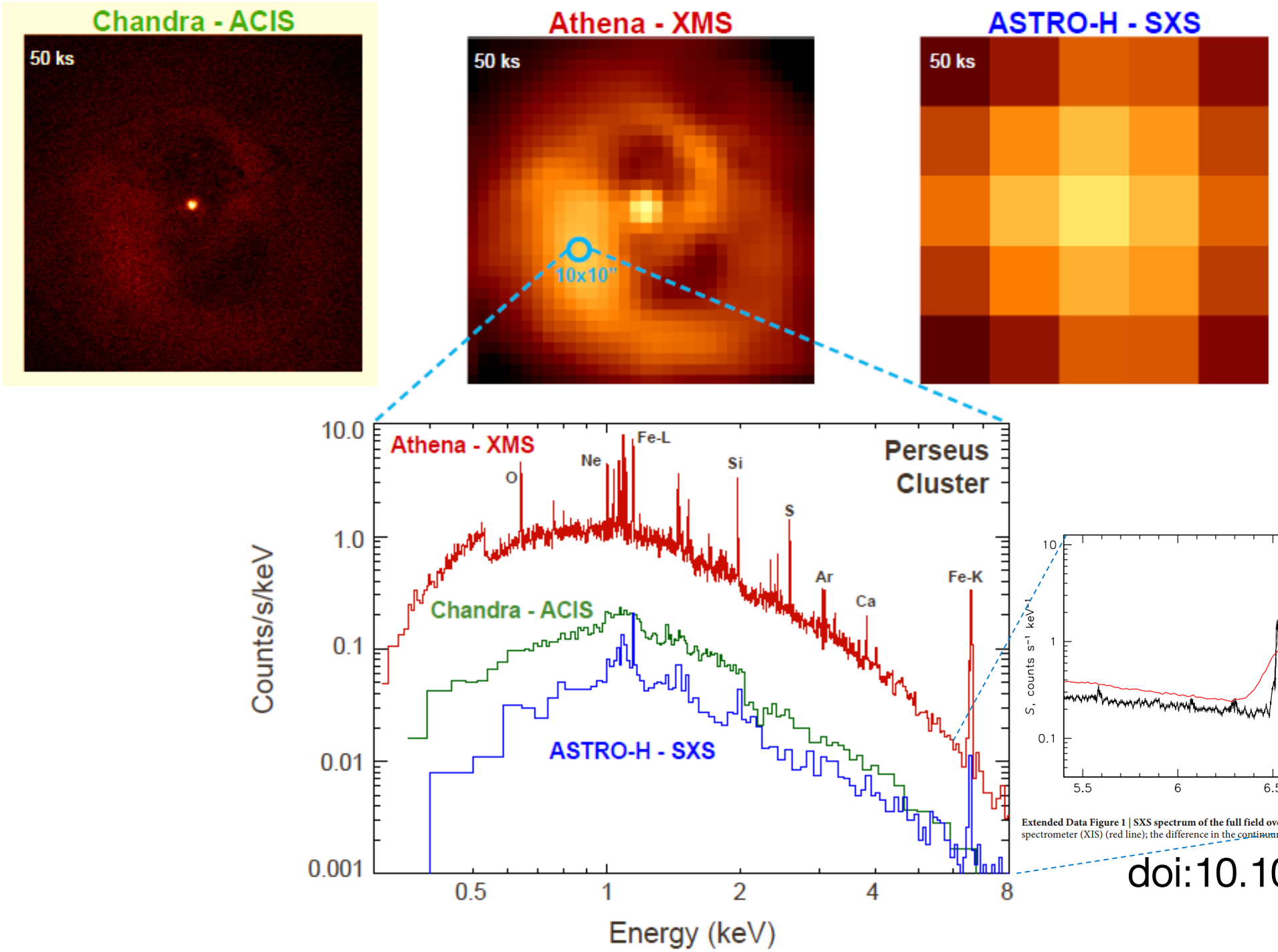
→ Photon focusing

→ High energy resolution spectra

} As the optical CCD

The X-ray Integral Field Unit:
the X-ray astronomy enters in a new era!

THE ATHENA X-IFU

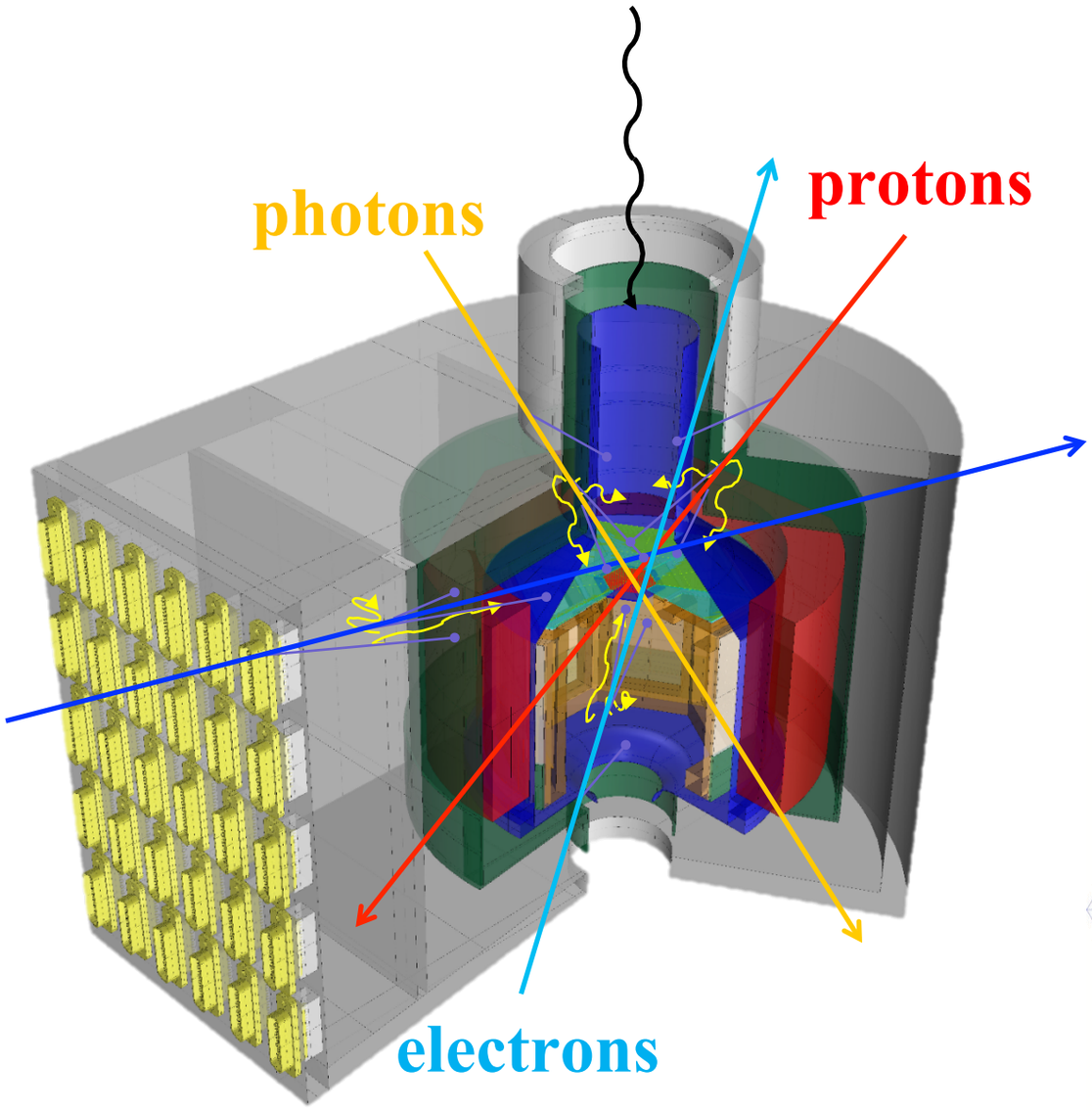


Extended Data Figure 1 | SXS spectrum of the full field overlaid with a CCD spectrum of the same region. The CCD is the Suzaku X-ray imaging spectrometer (XIS) (red line); the difference in the continuum slope is due to differences in the effective areas of the instruments.

doi:10.1038/nature18627

The particle background issue: no X-ray mission has ever flown in L2!

The scientific signals come from the top!!

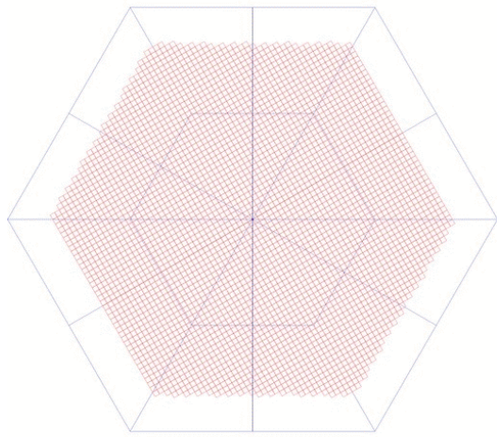


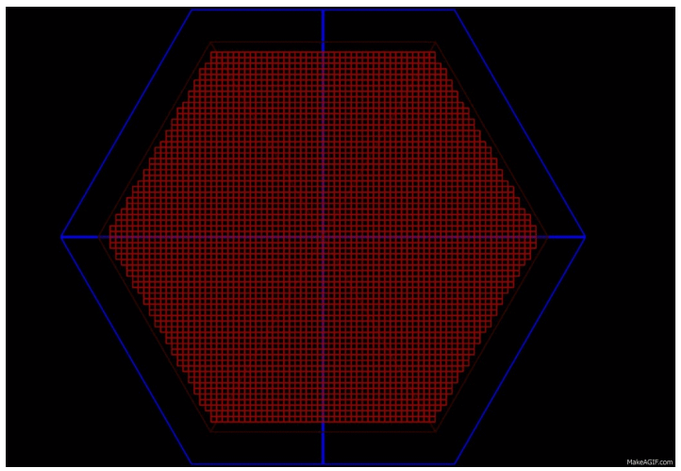
$$F_{\min} = \frac{n_\sigma}{QA_s}\sqrt{\frac{B_i A_d + B_d Q \Omega A_s}{t \Delta E}}$$

CAD

Credits: S. Lotti (IAPS)

Geant4 mass model





In this respect the main issues to be probed requested from the ATHENA team to ESA:

- L2 particle environment (GCR + Soft protons)
- Geant4 physics validation

AREMBES: the Statement of Work.

ESA issued an ITT tender which covered **"part"** of the already planned activities inside the X-IFU bkg workpackage from the L2 environment to the GEANT4 validation (then the residual particle bkg as output). From the scientific point of view this ITT involves the ATHENA satellite: X-IFU + WFI.

The Statement of Work consists of 3 Parts, to be framed in 30 Months of work ("%" relates to the allocated resources by ESA **– 600 kEuro**). **Modulus a 10% of the overall budget for the project management,** we have allocated:

- **Part 1 (30%, 9 Month):** Analyses of radiation effects data and experience from previous X-ray missions, consolidation of user requirements, improvement of L2 radiation environment models, and improvement of the relevant basic physics models to treat propagation of charged particles, photons and radiation background in X-ray mirrors and surrounding spacecraft structures

- **Part 2 (60%, 9 Month):** Development of a user-friendly radiation background simulator framework incorporating Part 1 output and considering the specific technologies used in the ATHENA telescope and foreseen instruments, verification of all software elements, construction of a representative ATHENA geometry model, and validation of the simulator performance

- **Part 3 (10%, 12 Month)**: This part covers the maintenance and upgrades of the developed software

10 Institutions/SMEs involved: ~ 599 k requested → 595 k approved
Activity kicked-off on 21st March 2016
Model Development Review (end of Phase 1) on January, 18, 2017

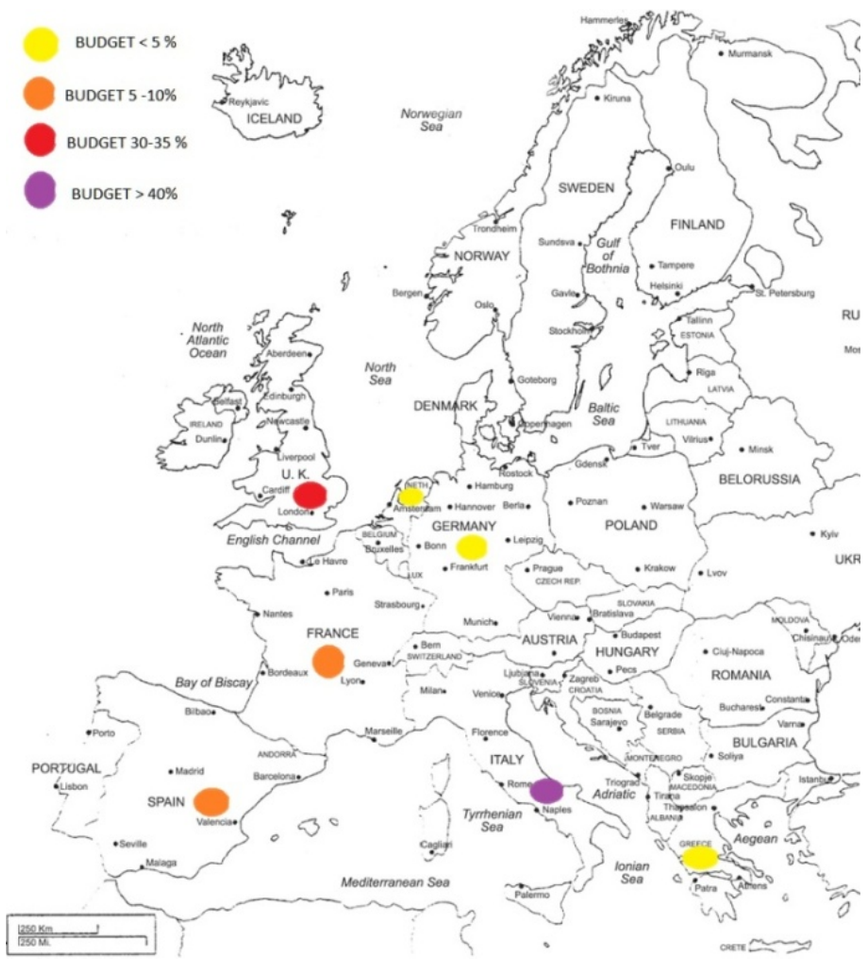
The AREMBES consortium (Key Persons).

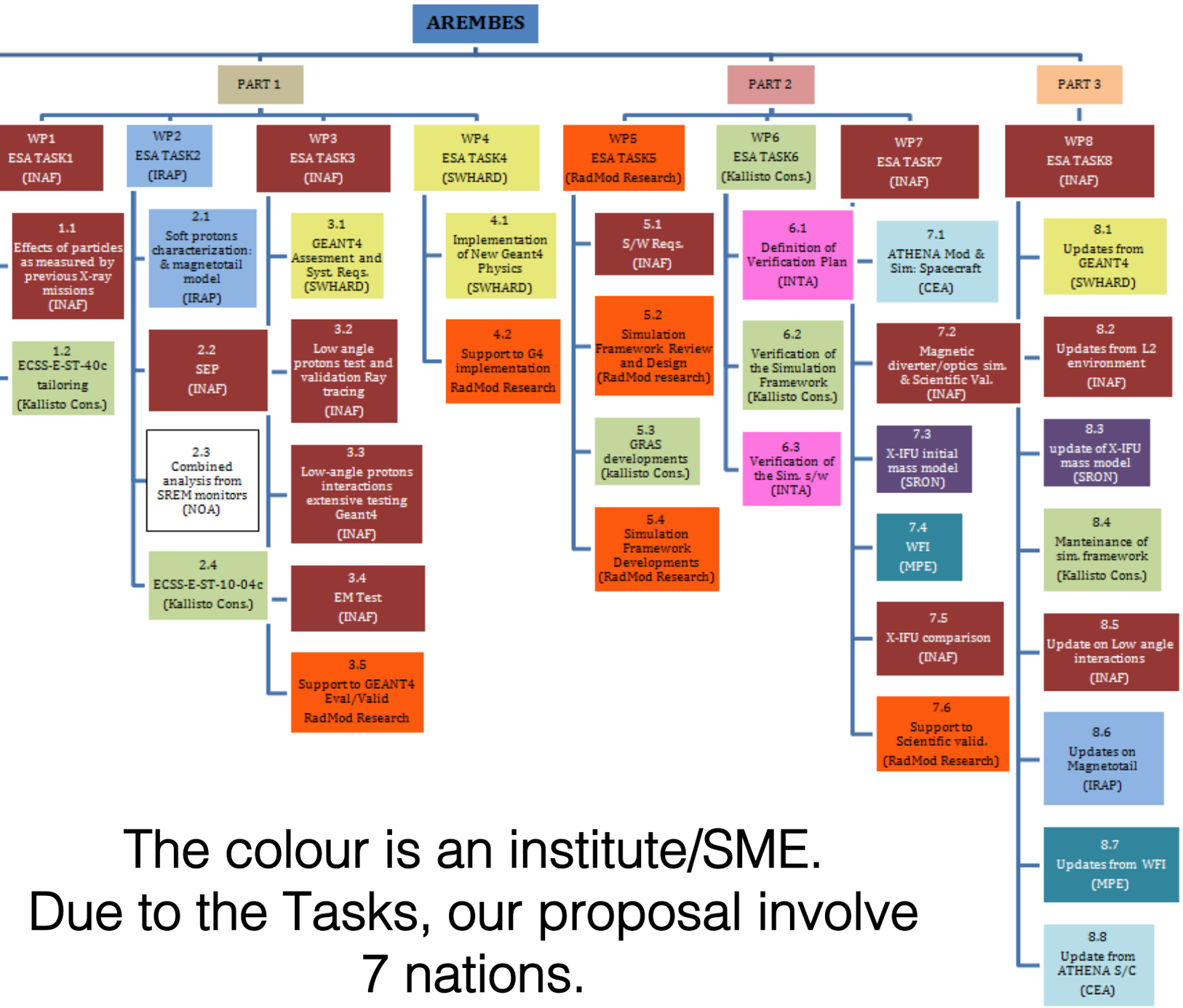
Name	Institute/SME
C. Macculi	INAF
S. Molendi	INAF
S. Lotti	INAF
A. Argan	INAF
M. Laurenza	INAF
M. Rossi	INAF
D. Martella	INAF
T. Mineo	INAF
A. Bulgarelli	INAF
V. Fioretti	INAF
V. Génot	IRAP
F. Pajot	IRAP
C. Jacquey	IRAP
F. Lei	Radmod
V. Ivanchenko	CERN
P. Truscott	Kallisto Consultancy
A. Mantero	SWHARD
P. Dondero	SWHARD
B. Gianesin	SWHARD
S.A. Ibarmia Huete	INTA
P. Laurent	CEA
Tanja Eraerds	MPE
Andreas von Kienlin	MPE
D. Haas	SRON
J. Dercksen	SRON
J.W. den Herder	SRON
A. Anastasiadis	NOA/IAASARS
I. Georgantopoulos	NOA/IAASRAS
I. A. Daglis	NOA/IAASARS

It has been necessary to involve different skills from:

- **X-ray astronomers**
- **Geant4 developers**
- **Plasma physicists**
- **s/w developers**

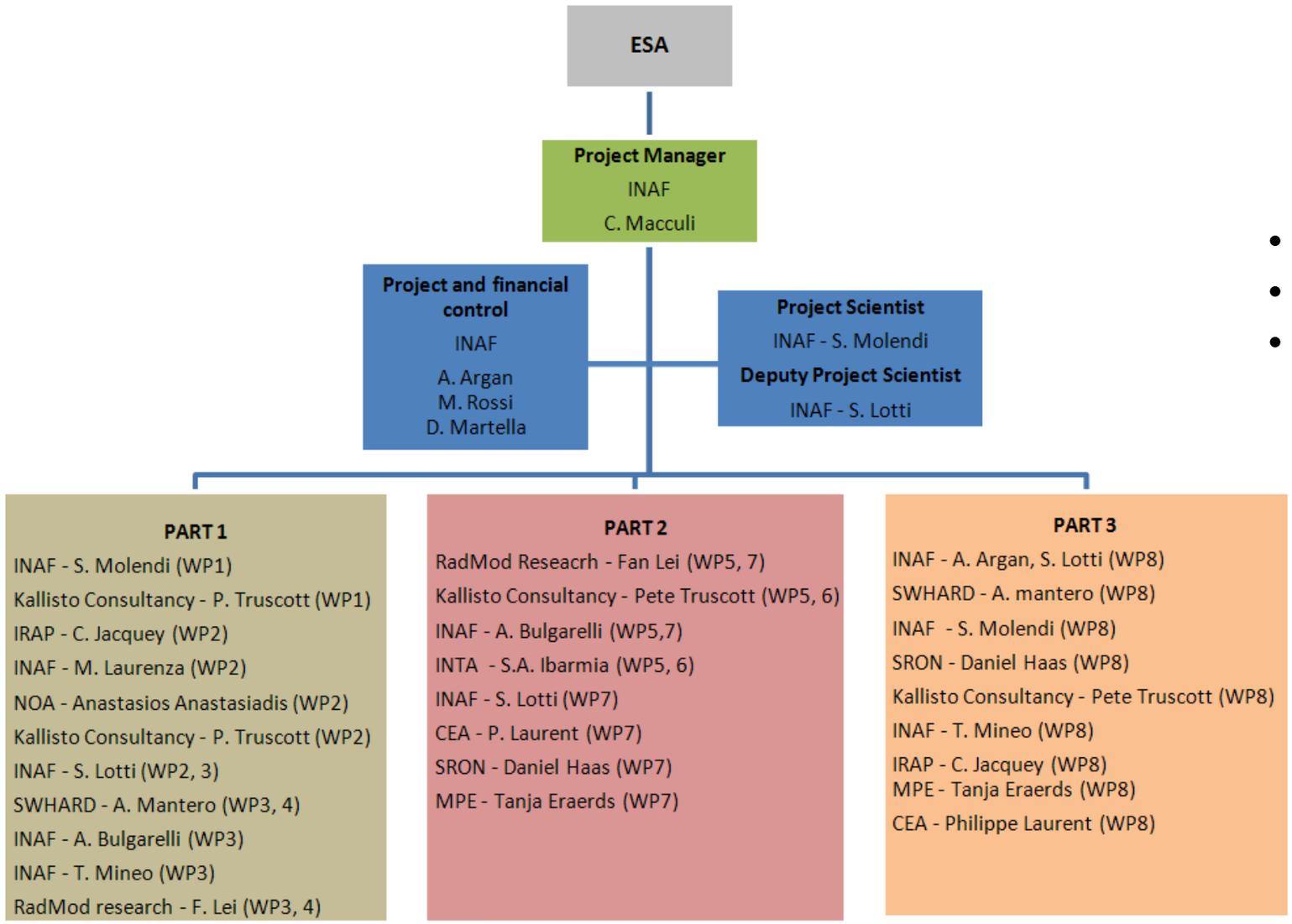
Geographic distribution and WBS





The colour is an institute/SME.
Due to the Tasks, our proposal involve 7 nations.

Organization Breakdown Structure



Modulus 10% of the resources allocated to the Project Management, we have:

- **Part 1 (30% resources, 9 Month)**
- **Part 2 (60% resources, 9 Month)**
- **Part 3 (10% resources, 12 Month)**

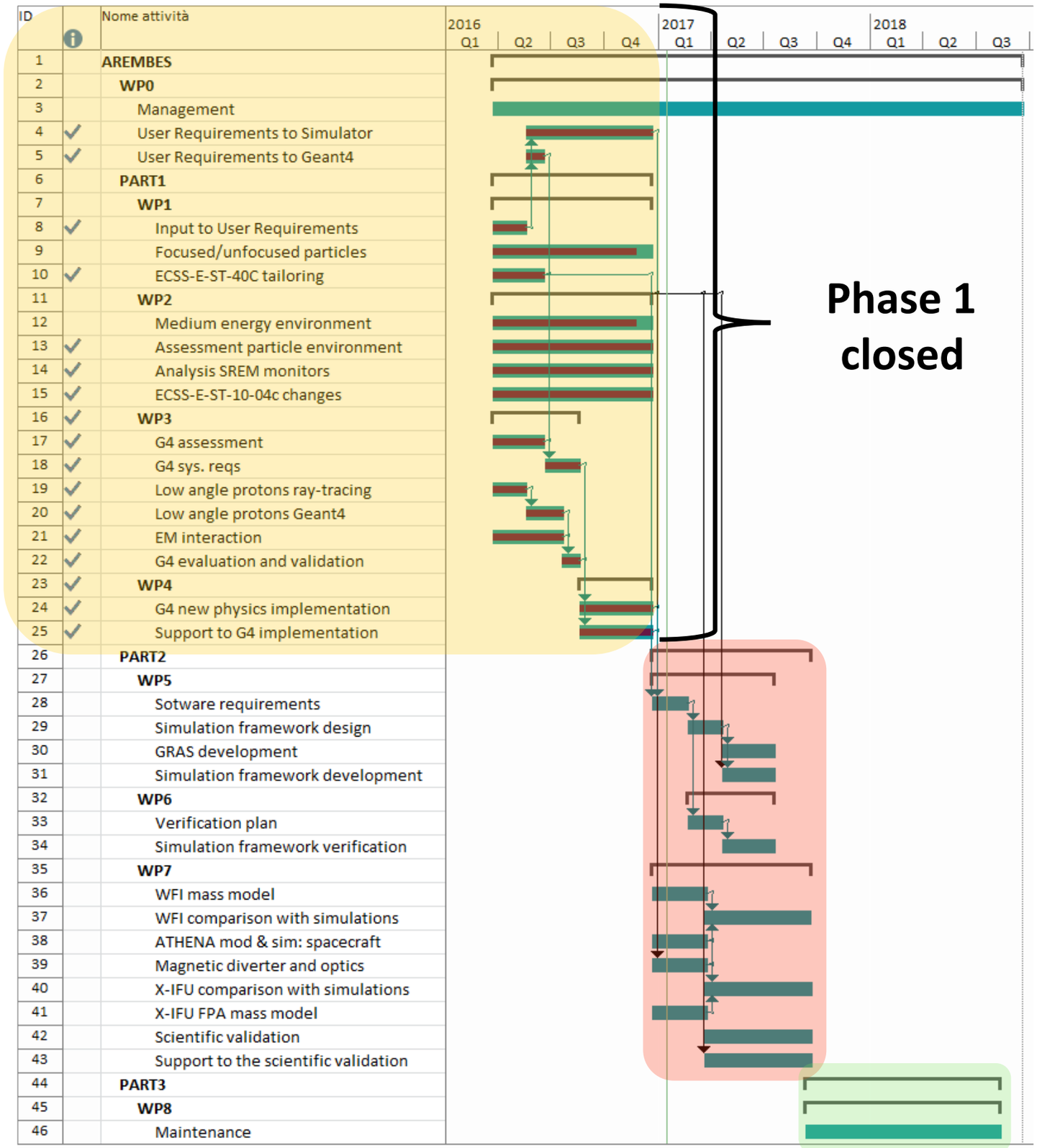
Minimum group of meetings requested by ESA
(+ project meetings)

Meeting	Date	Location	Milestone
Kick-off	T0	ESTEC	T0
PM1	End of Task 3	Italy	T0 + 5M
MDR: Model Development Review	End of Task 4	ESTEC	T0 + 9M
PM2	In the course of Task 5	UK	T0 + 15M
PM3	End of Task 6	Spain	T0 + 16M
SQR: Simulator Qualification Review	End of Task 7	ESTEC	T0 + 18M
PM4	In the course of Task 8	Telecon/WebEx	T0 + 24M
Final Presentation	End of activity	ESTEC	T0 + 30M

Deliverable n.	WP	Delivery	Expected date	Responsibility
Del. 0	0	Progress Reports	Monthly	INAF
Del. 1	0	TN 1.3_a on User Requirements to G4	T0 + 3M	INAF
Del. 2	0	TN 1.3_b on User Requirements to Simulator	T0 + 9M	INAF
Del. 3	0	SW-4	T0 + 30M	INAF
Del. 4	1.1	TN 1.1	T0 + 9M	INAF
Del. 5	1.2	TN 1.2	T0 + 3M	Kallisto Consultancy
Del. 6	2.1	TN 2.1	T0 + 9M	IRAP
Del. 7	2.1	SW-1	T0 + 9M	IRAP
Del. 8	2.4	TN 2.2	T0 + 9M	Kallisto Consultancy
Del. 9	3.1	System Requirements Doc.	T0 + 5M	SWHARD srl
Del. 10	3.1	TN 3.1	T0 + 5M	SWHARD srl
Del. 11	4.1	SW-2	T0 + 9M	SWHARD srl
Del. 12	4.1	TN 4.1	T0 + 9M	SWHARD srl
Del. 13	5.2	DJF of Simulation Framework	T0 + 13M	RadMod Research
Del. 14	5.4	TN 5.1	T0 + 16M	RadMod Research
Del. 15	5.4	SW-3	T0 + 16M	RadMod Research
Del. 16	5.4	SUM	T0 + 16M	RadMod Research
Del. 17	6.1	SVP for DJF (input to TN 6.1)	T0 + 13M	INTA
Del. 18	6.2	TN 6.1	T0 + 16M	Kallisto Consultancy
Del. 19	7.1	Verification rep. on its activity	T0 + 12M	CEA
Del. 20	7.2	TN 7.1	T0 + 18M	INAF
Del. 21	7.2	TN 7.2	T0 + 18M	INAF
Del. 22	8.1	Updates to TN 3.1	T0 + 24M	SWHARD s.r.l.
Del. 23	8.1	Updates to TN 3.1	T0 + 30M	SWHARD s.r.l.
Del. 24	8.1	Updates to TN 4.1	T0 + 24M	SWHARD s.r.l.
Del. 25	8.1	Updates to TN 4.1	T0 + 30M	SWHARD s.r.l.
Del. 26	8.2	Updates to TN 1.1	T0 + 24M	INAF
Del. 27	8.2	Updates to TN 1.1	T0 + 30M	INAF
Del. 28	8.5	Updates to TN 3.1	T0 + 24M	INAF
Del. 29	8.5	Updates to TN 3.1	T0 + 30M	INAF
Del. 30	8.6	Updates to TN 2.1	T0 + 24M	IRAP
Del. 31	8.6	Updates to TN 2.1	T0 + 30M	IRAP
Del. 32	8.6	Updates to TN 2.2	T0 + 24M	IRAP
Del. 33	8.6	Updates to TN 2.2	T0 + 30M	IRAP

Meeting PI

→ **Each month a progress report to be sent to ESA tech. officer**



Need of an upgrade? → CCN: Contract Change Notice

The ATHENA science team requested to also probe the L1 orbit, to provide a comparison betwe en L2 vs L1 → new activity wrt the AREMBES baseline → it needs of a CCN.
Further, during the negotiation meeting topics could be ported in a CCN.

APPENDIX 4: CONTRACT CHANGE NOTICE

For submission of a change as per Clause 13 of the General Conditions, the Contractor shall submit his proposal in the format of a CCN using the cover page included below. The form shall be filled with the following information as a minimum:

The Contractor's name and the Contract number

The title of the area affected by the change (Work Package reference, new work, etc.)

The name of the initiator of the change (Contractor or ESA)

The description of the change (including Work Package Descriptions, WBS, etc.)

The reason for the change

The price breakdown in €, if any (breakdown by company, Phase, etc., including PSS-A2 and PSS-A8 forms)

- The Milestone Payment Plan for the CCN if any

Effect on other Contract provisions

Start of work - end of work (including contractual delivery dates and overall planning, milestones, etc.)

A CCN Form, as per the format below, signed by the Contractor's representatives

The Contractor shall, on request of the Agency, provide additional documentary evidence. At the request of either Party, the proposed change may be discussed at a Change Review Board, consisting of both the Contracts Officer and the Technical Officer of each Party.

esa	DIRECTORATE:	Contractor:
		Contract No.:
CONTRACT CHANGE NOTICE No.		DATE:
TITLE OF AREA AFFECTED (WORK PACKAGE ETC):		WP REF:
		INITIATOR OF CHANGE:
DESCRIPTION OF CHANGE		
REASON FOR CHANGE		
PRICE BREAKDOWN (Currency)/PRICE-LEVEL		
EFFECT ON OTHER CONTRACT PROVISIONS		START OF WORK
		END OF WORK
CONTRACTOR'S PROJECT MANAGER: DATE:	CONTRACTOR'S CONTRACTS OFFICER: DATE:	
[DISPOSITION RECORD OR OTHER AGREED CONDITION RECORDED WITH THE CCN APPROVAL]		
ESA TECHNICAL OFFICER: DATE:	ESA CONTRACTS OFFICER: DATE:	

http://space-env.esa.int/index.php/news-reader/items/AREMBES.html

- 9 refereed paper (8 INAF 1st author)
- 1 conference proceeding (1st INAF)
- 4 talks (2 INAF) at the next Geant4 Space Users' Workshop (next week)

In 9 months activity (Phase 1)

The TN will be papers!

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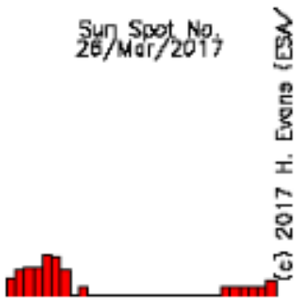
ATHENA Radiation Environment Models and X-Ray Background Effects Simulators

2016-03-22 11:48 by Petteri Nieminen

Development of a simulator for radiation effects on the ESA L-Class ATHENA mission

A new R&D activity has been kicked off on 21 March 2016, which aims to develop a comprehensive software simulator for the radiation background effects seen by the ESA L-Class science mission ATHENA. As part of the study, new models of the L2 low-energy radiation environment will also be developed, and updates to the relevant Geant4 physics treating the propagation of radiation through the ATHENA optics and spacecraft structures will be provided.

X-ray missions such as ATHENA will encounter on top of their scientific observations also an unwanted background caused by the charged particle radiation environment in space. With the specific technologies and instruments used in ATHENA, there are two main sources of such background. On of these is due to low-energy protons and ions propagated in shallow angles through the instrument optics, while the other is caused by high-energy galactic cosmic rays impinging on the spacecraft structures. Both of these posisble sources will be included in the simulator.



The orbit chosen for the ATHENA mission, a halo orbit around the Lagrangian L2 point 1.5 million km from the Earth in the direction away from the Sun, is becoming increasingly popular for various science missions. However the radiation environment of L2 is thus far relatively poorly modelled. One part of the present activity is to analyse available data from earlier interplanetary missions and to develop new models for this environment.

This study is being undertaken by INAF (I) in partnership with IRAP (F), NOA(G), SWHARD (I), RadMod Research (UK), Kallisto Consultancy (UK), CEA (F), INTA (E), SRON (NL) and MPE (D).

This activity is supported by ESA's Science Core Technology Programme (CTP). ESA Contract No. 4000116655/16/NL/BW.

Spotlight

- Space Environments & Effects Final Presentation Days 2017
- Meteoroids/Debris Final Presentation Day 2015
- Space radiation and Plasma Monitoring Workshop 2014
- Radiation Belts Workshop 2013
- ConeXpress space environment
- Radiation model comparison
- Application of radiation effects analysis tool GRAS for ESA space program

At present, INAF has several CTP proposal/contract in place for ATHENA as PI or WP leader

AREMBES - ATHENA Radiation Environment Models and x-ray Background Effects Simulators (C. Macculi, PI, IAPS)

EXACRAD - Experimental Evaluation of ATHENA Charged Particle Background from Secondary Radiation and Scattering in Optics (S. Molendi, PI, IASF-Milano)

ASPHEA - Alignment of Silicon Pore optics for High-Energy Astronomy (D. Spiga, PI, OABrera)

SIMPOSiuM - Silicon pore optics modelling and simulations (D. Spiga, PI, OABrera)

LAOF - Large area high-performance optical filter for X-ray instrumentation (M. Barbera, WP leader, UniPa/INAF Palermo)

TES Detector Development for Athena / X-IFU - Optimization of a European Transition Edge Sensor Array (L.Piro, C. Macculi, WP leader, IAPS)

…but also on other projects: NOT exhaustive list…

CAM - Contamination Assessment Microbalance (E.Palomba, PI, IAPS)