

GAMBLE Kick-Off 21/03/02 — AGENDA

LEGOS Toulouse, Lyot room, - 1400-1830

LEGOS laboratory is part of the “Observatoire Midi-Pyrénées” and is located very close to the CNES (just on the right of the round-circle which is at the main entrance of CNES). You will find more detailed and location map by going at the following web site (english and french version): <http://www.omp.obs-mip.fr/omp/umr5566>, there is a button “to find us” at the right end of the welcome page.

- 1. Welcome - Co-chairs — Yves Menard (CNES) / Tom Allan (SOS)**
- 2. Overview of GAMBLE(Tom Allan, Yves Menard)**
 - Project Main Aims, Timetable.
 - Membership (any suggestions for extending membership?).
 - Steering Group role.
 - How to link with other programmes (including US).
- 3. Contract and Finance Issues (Ellis Ash, YM/Nathalie)**
- 4. Data/information exchange between the Gamble participants and outside (Ellis Ash)**
 - Using the dedicated web site, mailbox, pubs, meetings....
- 5. Review of status of missions post JASON-1, ENVISAT**
 - JASON 2, Altika (Yves/Patrick/Eric)
 - GANDER (Tom Allan)
 - Others: SWIMSAT (D. Hauser), US initiatives (WSOA) (Yves/Patrick/Eric...)
 - Discussion of combinations /scenarios to be studied under GAMBLE

Break at 1530

- 6. Work Packages - the 6 GAMBLE Themes**

For each theme we are asking for a short presentation (~ 5-10 minutes) on the key challenges / important issues, and an identification of relevant recent studies (we could start a bibliography for each theme on the web site?).

We would also ask each work package leader to review the deliverables and timetable (see attached documents), and consider the practical aspects of how these can be achieved. This includes suggestions for provisional dates and locations of workshops.

 - Theme 1 - Sea Surface height (CLS — P.YLe Traon)**
 - Theme 2 - State State (ISDGM — LuigiCavaleri)**
 - Theme 3 - Orbit determination.... (DUT - Eelco Doornbos)**
 - Theme 4 - Marine Operators Requirements (SOS - David Cotton)**
 - Theme 5 - Research Programme (SOC — PeterChallenor)**
 - Theme 6 - Constellation Optimisation (CNES - Yves, Patrick)**

- 7. GAMBLE meetings and Deliverables in 2002 (David Cotton)**
- 8. Any other Business**
- 9. Close**

Kick Off Meeting Notes**1. GAMBLE Partners**

UK	CO1	Satellite Observing Systems (SOS)	For GANDER
F	CR2	Centre National des Etudes Spatiales (CNES)	For JASON
NL	CR3	Delft University of Technology (DUT)	Orbit analysis
IT	CR4	Istituto per lo Studio della Dinamica delle Grandi Masse (ISDGM)	Sea-state
UK	MB5	Southampton Oceanography Centre (SOC)	Large scale oceanographic circulation and climate studies
F	MB6	Collecte Localisation Satellites (CLS)	AltiKa, oceanographic circulation studies
UK	MB8	Univ. Newcastle (UNEW)	Satellite Tracking, JASON PI
F	MB9	ALCATEL	Altimeter Instrumentation
F	MB10	Centre d'Etudes des Environnements Terrestre et Planetaires (CETP)	Leader of SWIMSAT proposal
F	MB11	Service Hydrographique et Oceanographique de la Marine (SHOM)	AltiKa. Responsible for French Navy and global Mercator ocean forecasting systems, JASON PI
F	MB12	Universite Joseph Fourier	Principal Investigator of AltiKa. Multi-satellite studies, JASON PI
F	MB13	Laboratoires d'Etudes en Geophysique et Oceanographie Spatiale (LEGOS)	Tidal modelling, JASON PI
UK	MB14	Proudman Oceanographic Laboratory (POL)	Tidal Modelling, Coastal Studies, JASON PI
UK	MB15	Surrey Satellite Technology Ltd. (SSTL)	Microsat technology.
F	MB16	Universite Versailles St Quentin	Linked to MB10 as joint research unit
F	MB17	Laboratoire des Ecoulements Geophysiques et Industriels	Linked to MB12 as joint research unit
F	MB18	Institut National Polytechnique de Grenoble	Linked to MB12 as joint research unit
DE	MB19	Max Planck Institut	Meteorology, modelling.
UK	MB20	Environmental Systems Science Centre	Assimilation, modelling
NO	MB21	Nansen Environment and Remote Sensing Centre	Climate and Environment studies, operational forecasting, modelling

Steering Committee

OceanRoutes (J Thompson), Shell International Exploration and Production (C. Shaw), BP Amoco Exploration (C. Grant), Dockwise (C Leenaars), EuroGOOS (T. Guymer), CLS (P. Gaspar), MeteoFrance (P. Dandin), ENEA (G. Manzella)

2. Formal GAMBLE Deliverables to EC

WP1 CNES Project Kick off and Project Definition

Deliverables D1 Project Definition April 2002

WP2 CLS Sea Surface Height Error Budgets

Deliverables D2 Interim Report for tracking workshop August 2002

D3 Final SSH Report Feb 2003

WP3 ISDGM Sea State Error Budgets

Deliverables D4 Interim Report for tracking workshop August 2002

D5 Final SSH Report March 2003

WP4 DUT Orbit Determination and Satellite Tracking

Deliverables D6 Orbit and tracking recommendations Oct 2002

WP5 SOS Marine Operators Workshop

Deliverables D7 Report on Operational Requirements Oct 2002

WP6 DUT Mid Term Review

*Deliverables D8 Report on Error budgets and potential solutions
Feb 2003*

WP7 SOC Research Programme

*Deliverables D9 Framework for Recommended Research (1st Milestone)
Jul 2003*

WP8 CNES Constellation Optimisation Workshop

Deliverables D10 Orbit recommendations Sep 2003

D11 Payload recommendations Sep 2003

(D10, D11 Milestone 2 – NB ESA altimeter studies due to be complete by end 2002)

WP9 CNES Final Workshop

Deliverables D12 Workshop Report Nov 2003

WP10 SOS Management and Reporting

Deliverables D13-18 regular reports to EC (6 monthly intervals) Mid term and Final EC Report.

3. Approximate GAMBLE Meeting Dates

21st March 2002 LEGOS TOULOUSE - GAMBLE Kick-off

- ~July 2002** Orbits and tracking workshop
(taking input from error budget studies - how to optimise sampling, crossover corrections)
- ~Sep 2002** Marine operators workshop
(to provide recommendations from an operational perspective)
- ~Oct 2002** Sea surface height error budget and feature detection workshop
(to provide recommendations for multi-satellite measurements)
- ~Nov 2002** Sea state error budget and feature detection workshop
(to provide recommendations for multi-satellite measurements)
- ~Jan 2003** Mid term review workshop
- ~June 2003** Constellation optimisation workshop
(to provide recommendations for orbits and satellite payloads)
- ~Oct 2003** Final workshop

Some Oceanography and Remote Sensing Meetings in 2002-2003

21-26th Apr 2002 Nice EGS (European Geophysical Society)

20-22nd May 2002 Miami 7th Int. Conf. on Remote Sensing for Marine and Coastal Environments

28th May-1st Jun 2002 Washington, USA AGU Spring Meeting

10-15th Jun 2002 Biarritz, France TOPEX/Poseidon-Jason SWT, En route to GODAE

24-28th Jun 2002 Toronto IGARSS 2002

7-11th July 2002 Seattle, USA Remote Sensing and Space Technology (SPIE)

9-12th July 2002 Wellington, New Zealand AGU Western Pacific

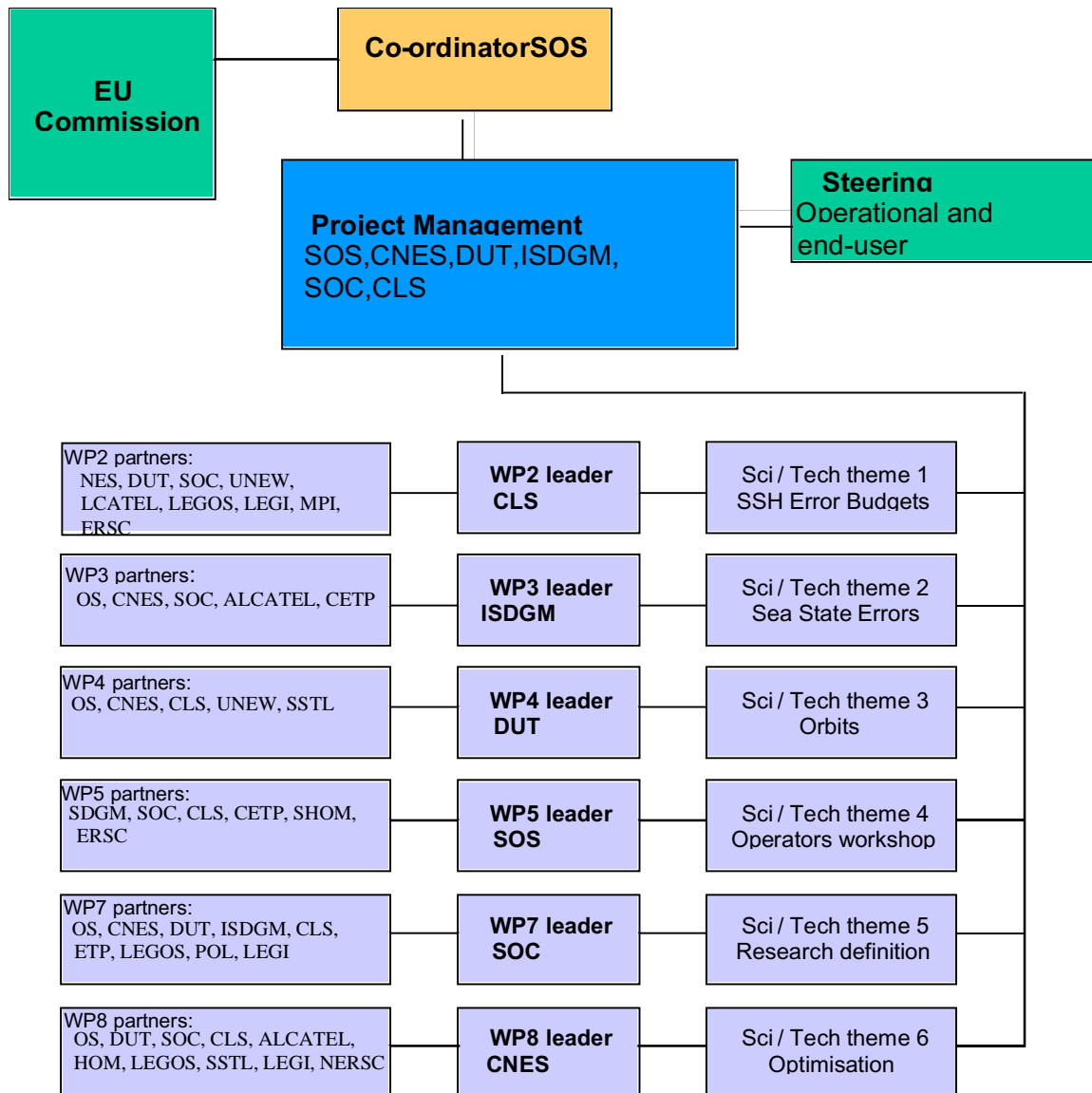
23-27th Sept 2002 Agia Pelagia, Crete SPIE - Remote Sensing of the Ocean and Sea Ice

10-19th Oct 2002 Houston, USA 34th COSPAR (Committee on Space Research) | Earth Observation

6-10th Dec 2002 San Francisco AGU Fall Meeting

6-11th Apr 2003 Nice Joint EGS / AGU / EUG meeting

4. GAMBLE Management Diagram



5. GAMBLE management

- GAMBLE is a thematic network. The activities are workshops and discussion forums which aim to bring to bear new results and existing expertise to help maximise the benefits of independently initiated satellite projects.
- The aim is to establish a wide and inclusive network which engages as wide a community as possible. Most of the deliverables will be publicly accessible through a project web site, and open e-mail discussion forum. A contingency fund is available to support participation from new partners.
- SOS and CNES will be responsible for overall co-ordination and SOS for reporting to the EC. SOS, CNES, DUT, ISDGM, SOC and CLS will form the joint management committee.
- An independent Steering Group will review and oversee progress on behalf of the user community and the EC.
- GAMBLE participants are tasked to co-ordinate with all interested parties in their scientific sphere of interest, to prepare and present the state of the art, and to participate in discussions at workshops or in scientific “expert groups”.
- The work programme is arranged along six themes. Each addresses a specific issue, and will provide recommendations as to the best ways to combine, or modify, proposed missions to maximise the scientific and operational benefit. These various recommendations will then be reviewed together at a final workshop with the aim to reach a consensus on recommendations for future satellite missions.

6. MILESTONES

GAMBLE will work towards the achievement of two milestones:

M1 (July 2003): The definition of a research programme to make best use of data from missions studied under GAMBLE. The main aim of this programme will be to create a methodology for combining these data sets into higher level data products for research and applications.

M2 (September 2003): Recommendations for the optimisation of the future altimeter missions (orbits, tracking, orbit maintenance, payload specifications, scheduling).

7. REPORTING AND COMMUNICATION

Communications will mostly be through email. A GAMBLE Web Site has been established at <http://www.altimetric.net>. Summary reports of the progress made will be made at intervals of at most 3 months. The conclusions of the 3 planned Workshops will be reported in written form. Where possible workshops will be convened to co-ordinate with other meetings, to reduce cost and increase attendance.

8. FORMAL AIMS FOR KICK OFF MEETING

Objectives:

To generate detailed work plan and establish expert groups. Establish GAMBLE Steering Group.

Inputs:

GAMBLE Description of Work

Methodology:

Convene workshop at which the GAMBLE team will:

- Define the best approach to apprehend the whole problem
- Define the best approach to simulate the combined missions of the future
- Identify resources
- Assign responsibilities
- Establish a series of topic specific expert review groups

Deliverable D1 Project Definition April 2002

9. THE SIX GAMBLE THEMES

(NB Refer also to full descriptions in “Description of Work” downloadable from GAMBLE WEB SITE – <http://www.altimetric.net>)

THEME 1°: SEA SURFACE HEIGHT ERROR BUDGETS, FEATURE DETECTIBILITY

<p>Start Date April 2002 Finish Date February 2003 Total Person months 5.5 WP Leader, CLS Participants: CNES, DUT, SOC, CLS, UNEW, ALCATEL, SHOM, LEGOS, POL, LEGI, MPI, NERSC</p>		
<p>Objectives: To generate requirements for accuracy , space-time sampling of altimeter measurement and orbit maintenance/ measurement to provide detectability of target oceanic features.</p>		
<p>Inputs: Conclusions/recommendations from most recent workshops, reports and literature. Jason, GANDER, AltiKa, SWIMSAT mission specifications documents.</p>		
<p>Methodology: Engage expert advice, review and assess state of the art knowledge from most recent workshops and literature. Analyse past and present records, and results from simulations. Funds have been allocated to support a workshop (12 attendees), the workshop date will be set towards the end of the work package in co-ordination with JASON SWT meetings /ENVISAT symposia.</p> <ul style="list-style-type: none"> • Discuss and investigate possible error budget and sampling of GANDER-only measurements of topography • Discuss and investigate possible error budget and sampling of GANDER/Jason/AltiKa/SWIMSAT measurements of ocean topography • Report on offshore features that may be detected including major current boundaries, mesoscale variability, thanks to a GANDER-only constellation and a combined GANDER/Jason/AltiKa/SWIMSAT constellation • Report on coastal features and tide components that may be detected with improved altimeter techniques and sampling capabilities. 		
Deliverables	D2 – Report for Tracking Workshop	August 2002
	D3 – Final Features/ Errors Report	February 2003

THEME 2°: SEA-STATE ERROR BUDGETS, FEATURE DETECTIBILITY

Start Date April 2002 Finish Date April 2003 Total Person months 3.0 WP Leaders, ISDGM Participants: SOS, CNES, ISDGM, SOC, ALCATEL, CETP		
Objectives: To generate requirements for accuracy , space-time sampling of altimeter measurement and orbit maintenance/ measurement to provide detectibility of target sea-states.		
Inputs: <ul style="list-style-type: none"> • Conclusions/recommendations from most recent workshops, reports and literature. • Jason, GANDER, AltiKa, SWIMSAT mission specifications documents. 		
Methodology: Engage expert advice, review and assess state of the art knowledge from most recent workshops and literature. Analyse of past and present records, and results from simulations. Funds have been allocated to support a workshop (9 attendees), the workshop date will be set towards the end of the work package in co-ordination with JASON SWT meetings /ENVISAT symposia. <ul style="list-style-type: none"> • Discuss and investigate possible error budget and time-space coverage to GANDER only measurement of sea-state. • Discuss and investigate possible error budget and time-space coverage to GANDER/Jason/AltiKa/SWIMSAT measurements of sea-state. • Report on the contribution of wave spectral information as provided by SWIMSAT together with a GANDER type constellation (providing high density wave-height and wind speed) towards a better understanding of the physics of ocean waves. • Report on the contribution/assimilation of a GAMBLE constellation, including SWIMSAT spectral observation, into models for sea-state analysis and forecast. 		
Deliverables	<i>D4 – Interim Report for Tracking Workshop</i>	<i>August 2002</i>
	<i>D5–Final Features/ Errors Report Re PU</i>	<i>April 2003</i>

THEME 3^o: ORBIT DETERMINATION AND SATELLITE TRACKING WORKSHOP

Start Date July 2002 Finish Date September 2003 Total Person months 3.0 WP Leader, DUT Participants, SOS, CNES, DUT, CLS, UNEW, SSTL
Objectives: To provide recommendations for optimum orbits, orbit maintenance and satellite tracking and expected orbit error budget for GANDER
Inputs: Themes 1 and 2 interim reports
Methodology: Convene meeting with orbit determination community, which will: <ul style="list-style-type: none">• Ascertain how much tracking of GANDER microsats is needed to sufficiently characterise features as determined in D2, in a GANDER-only constellation• Ascertain how much tracking of GANDER microsats is needed, in a combined GANDER/Jason/AltiKa/SWIMSAT constellation• Estimate overall accuracy of height determination, in a GANDER-only and a combined constellation with and without GANDER laser tracking• Recommend if all or some GANDER microsats require modification to design . Funds have been allocated to support a workshop (7 attendees).
<i>Deliverable D6 Orbit and Tracking recommendations November 2002</i>

THEME 4^o: MARINE OPERATOR S WORKSHOP

<p>Start Date September 2002 Finish Date November 2002 Total person months 3.5 WP Leader, SOS Participants, SOSISDGM, SOC, CLS, CETP, SHOM, NERSC</p>
<p>Objectives: To gain input from operational end-users and determine required provision of near real time seastate and ocean current information.</p>
<p>Inputs: Interim reports from themes 1 and 2 Return from on-going experiments in operational oceanography and marine meteorology (e.g. SOPRANE, MERCATOR programmes and sea-state forecast services)</p>
<p>Methodology: Convene a Workshop of marine/ocean applications operators (possible venue:- Rotterdam). Funds have been allocated for 30 attendees.</p> <ul style="list-style-type: none">• Determine more precisely their requirements for near real-time information on sea state and current regime.• In particular establish with what accuracy currents and severe sea-state information may be detected and delivered to ships at sea within a specified time-frame.
<p><i>Deliverable D7 Report on Operational Requirements November 2002</i></p>

THEME 5°: DEFINE RESEARCH PROGRAMME

Start Date February 2003 Finish Date June 2003 Total Person months 5 WP Leader, SOC Participants, SOS, CNES, DUT, ISDGM, SOC, CLS, CETP, SHOM, LEGOS, POL, LEGI
Objectives: Define a recommended programme of research to be pursued by research centres (outside the terms of the GAMBLE thematic network) during the life of the GANDER, JASON and ENVISAT missions.
Inputs: Reports from Themes 1 and 2, user requirements from operators' workshop (theme 4)
Methodology: <ul style="list-style-type: none">• Establish work to be done to ensure that wave, wind and current data products can be generated and expeditiously delivered for<ol style="list-style-type: none">a) Climate studiesb) Routine marine operations• Investigate potential impact on ground segment system designs, including data processing, distribution etc. No Workshop is supported for this activity.
<i>Deliverable D9 / Milestone M1</i> <i>Framework for Recommended Research June 2003</i>

THEME 6°: CONSTELLATION OPTIMIZATION WORKSHOP

<p>Start Date June 2003 Finish Date August 2003 Total Person months 5.5 WP Leader, CNES Participants, SOS, CNES, DUT, SOC, CLS, ALCATEL, CETP, SHOM, LEGOS, SSTL, LEGI, NERSC</p>				
<p>Objectives: Provide recommendations for orbits, orbit maintenance and tracking, orbit phasing, and satellite / payload specifications. Provide preliminary GAMBLE multi-satellite configurations/scenarios.</p>				
<p>Inputs: Reports from themes 1, 2, 3 and 4.</p>				
<p>Methodology: Convene Workshop. Funds have been allocated for 14 attendees. Bring GANDER, Jason, AltiKa, SWIMSAT project people together with experts in multi-satellite simulations to:</p> <ul style="list-style-type: none"> • Evaluate existing and emerging technologies • Analyse simulation outputs • Issue recommendations for possible microsat constellations with respect to user requirements (from marine/ocean applications and science users) and to the performance/cost ratio. <ul style="list-style-type: none"> (a) Orbit specifications (b) Modifications to satellite and instrument specifications 				
<p>Deliverables</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;"><i>D10 Recommendations for future altimeter Orbits.</i></td> <td style="text-align: right; padding-right: 20px;"><i>August 2003</i></td> </tr> <tr> <td style="padding-left: 20px;"><i>D11 Recommendations for future altimeter payload specifications.</i></td> <td style="text-align: right; padding-right: 20px;"><i>August 2003</i></td> </tr> </table> <p>D10 and D11 together constitute <i>Milestone M2</i></p>	<i>D10 Recommendations for future altimeter Orbits.</i>	<i>August 2003</i>	<i>D11 Recommendations for future altimeter payload specifications.</i>	<i>August 2003</i>
<i>D10 Recommendations for future altimeter Orbits.</i>	<i>August 2003</i>			
<i>D11 Recommendations for future altimeter payload specifications.</i>	<i>August 2003</i>			

10. MANPOWER TABLE (STAFF MONTHS / WORK PACKAGE)

	WP1 Kick- Off	WP2 SSH	WP3 Sea State	WP4 Orbits	WP5 Marine Ops	WP6 Mid Term Rev	WP7 Res. Prog.	WP8 Optim	WP9 Final W'shop	WP10 Manag	WP11 Exploit	Total
CO1- SOS	0.75	0	0.75	0.75	1.0	0.75	0.25	0.75	0.75	2.5	1	9.25
CR2- CNES	0.5	0.5	0.25	0.25	0	0.25	0.25	0.5	0.25	0.25	0	3.0
CR3- DUT	0.5	0.75	0	1	0	0.75	0.75	0.75	0.75	0.75	0.5	6.5
CR4- ISDGM	0.25	0	0.75	0	0.75	0.75	0.75	0	0.75	0.75	0	4.75
MB5- SOC	0.5	0.75	0.5	0	0.5	0.5	1	0.5	0.75	0.5	0.5	6.0
MB6- CLS	0.5	0.5	0	0.25	0.5	0.5	0.25	0.5	0.5	0.5	0	4.0
MB8- UNEW	0	0.5	0	0.5	0	0.5	0	0	0.5	0	0	2.0
MB9- ALCA	0	0.5	0.25	0	0	0	0	0.5	0.5	0	0	1.75
MB10- CETP	0	0	0.5	0	0.25	0	0.5	0.5	0.25	0	0	2.0
MB11- SHOM	0	0.25	0	0	0.25	0	0.25	0.25	0.25	0	0	1.25
MB12- UJF	0	0	0	0	0	0	0	0	0	0	0	0
MB13- LEGOS	0	0.25	0	0	0	0	0.5	0.25	0.25	0	0	1.25
MB14- POL	0	0.25	0	0	0	0	0.25	0	0.25	0	0	0.75
MB15- SSTL	0	0	0	0.25	0	0	0	0.5	0.25	0	0	1.0
MB16- UVSQ	0	0	0	0	0	0	0	0	0	0	0	0
MB17- LEGI	0	0.5	0	0	0	0	0.25	0.25	0.25	0	0	1.25
MB18- INPG	0	0	0	0	0	0	0	0	0	0	0	0
MB19- MPI	0	1.0	0	0	0	0	0	0	0	0	0	1.0
MB20- ESSC	0	0	0	0	0	0	0	0	0	0	0	0
MB21- NERSC	0	0.25	0	0	0.25	0	0	0.25	0	0	0	0.75
TOTAL	3.0	5.5	3.0	3.0	3.5	3.75	5.0	5.5	6.0	5.25	2.0	45.5