ALBiUS

Huib Jan van Langevelde JIVE/Leiden

ALBUS, ALBiUS

- ## Software component in RadioNet
  - RadioNet is an I3 activity in EC 6th Framework Program
  - And will be an "Integrating Activity" in FP7
  - Software development in so-called Joint Research Activities

- ## ALBUS (Advanced Long Baseline User Software)
  - Budget 948k€, 4 partners, 4 year project (became 5)
    - Plus 100% matching at each institute
    - Most partners required to hire new staff on project
  - Started Jan 2004, must finish in 28 days….

- ## ALBiUS (Advanced Long Baseline interoperable User Software)
  - Or: more Advanced Long Baseline User Software
  - Budget 1000k€, 9 partners, 3 year project
    - Plus 75% of local matching after negotiations
    - Can write hours of staff on this program
  - Expected to start Jan 2009, must kick-off in 29 days…
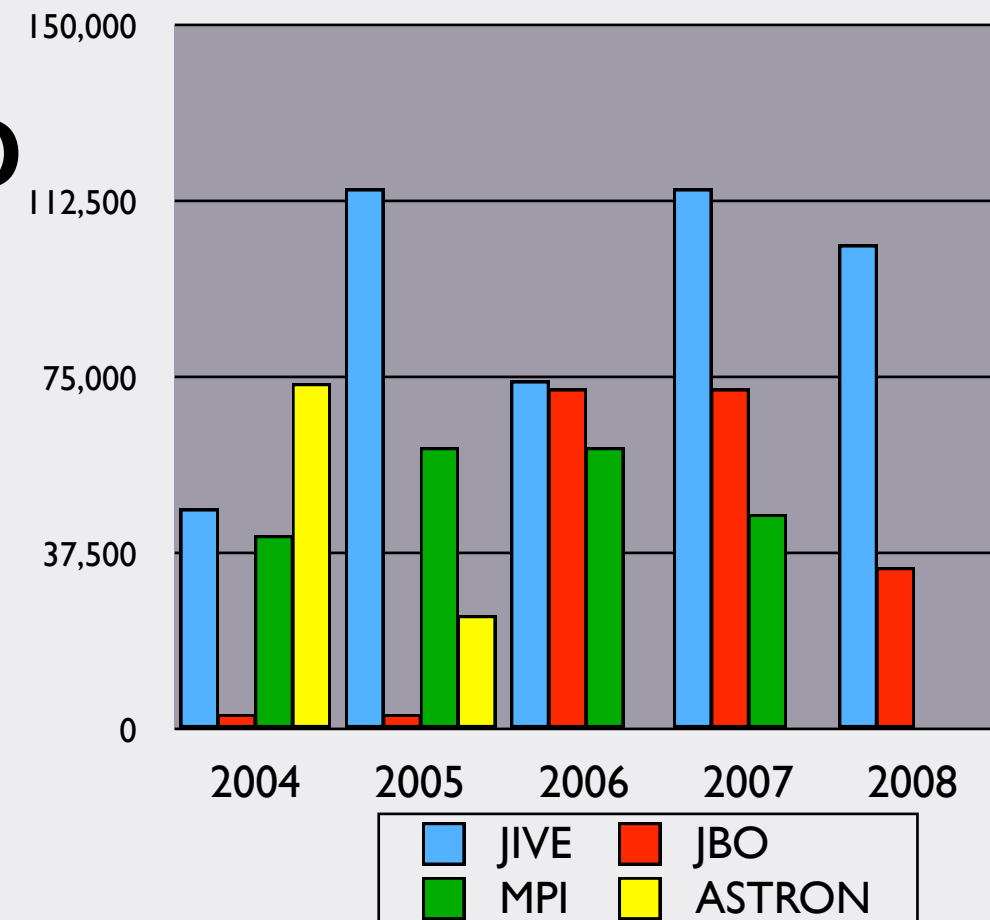
Advanced Long Baseline User Software

- # Joint Research Activity on user domain software
  - ## Dominated by the concerns on data volumes VLBI and MERLIN
  - ## And common calibration problems

- # Efforts at JIVE, ASTRON, MPI, JBO
  - ## Enhance data product
    - calibration info
    - external atmospheric calibration
    - archive selection methods
  - ## Large Data Volumes
    - research parallel processing
    - wide band data processing
    - wide field processing

  - ## Later: ParselTongue: common interface
    - AIPS talking Python
    - For common distribution and user access method

Bar chart of data volumes for 2004–2008 with legend: JIVE (light blue), JBO (red), MPI (green), ASTRON (yellow). Y-axis from 0 to 150,000.

ALBUS overview

JIVE — JOINT INSTITUTE FOR VLBI IN EUROPE

- **Part 1: Enhancing the product**
  - Calibration Transfer (JIVE)
    - Antenna Gains
    - Phase Cal Tones

    95%, documentation

  - Ionospheric calibration (JIVE)
    - Global GPS
    - Global model

    95%, finishing up docs

  - Tropospheric calibration (MPI)
    - Using GPS
    - WVR
    - Frequency

    95%, verifying GPS

  - Post correlator proc (JIVE)
    - PCInt data flow
    - Target selection
    - Web portal

    20%, unlikely to deliver

- **Part 2: Imaging**
  - Parallelization (ASTRON)
    - Bottlenecks
    - MIRIAD & scripting

    D O N E

  - Wide Band Imaging (JBO)
    - Analysis
    - Implement
    - Test

    90%, python version

  - Wide field Imaging (JIVE)
   - Analysis
    - Implement

    80% spectral line vers

- **New 3: Software infrastructure**
  - ParselTongue (JIVE)
    - Scripting
    - Calibration access
    - Distributed computing

    90%, parallelizing

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Achievements

- **Some presented in this meeting**
  - **Wide band imaging Jodrell Bank**
  - **ParselTongue at JIVE**

- **But there is more...**
- **Tropospheric calibration MPI**
  - **Using WVR devices**
  - **Or GPS**
  - **or multifrequency observations**

- **Ionospheric calibration (JIVE, Anderson)**
  - **Using GPS**
  - **And making image plane corrections**
  - **Feeding into the LOFAR calibration strategy**

- **Wide fields imaging VLBI**
  - **Combined with low freq calibration at 327MHz**
  - **Spectral line, searching methanol masers**
  - **parallel processing**
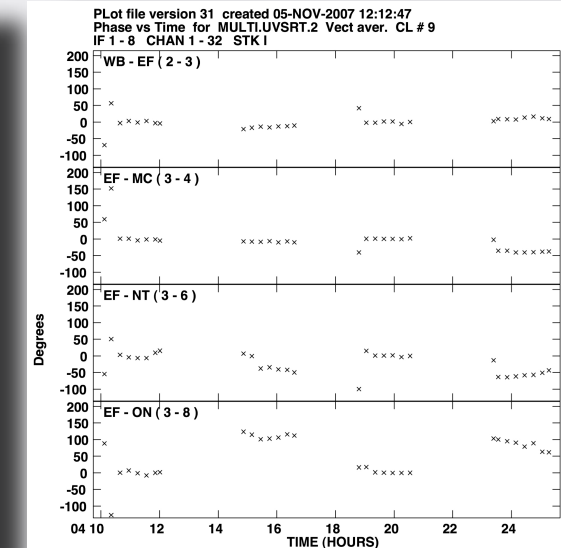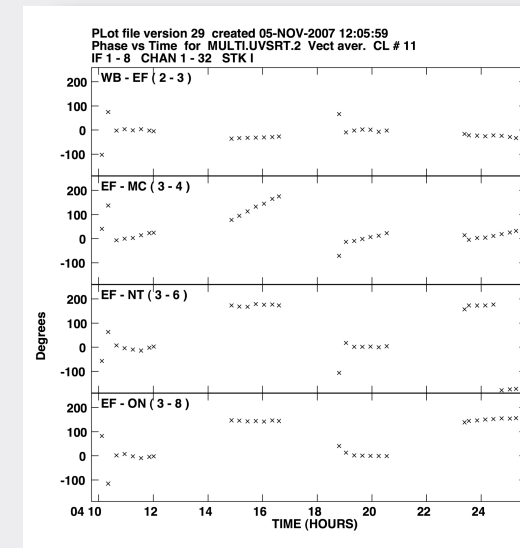
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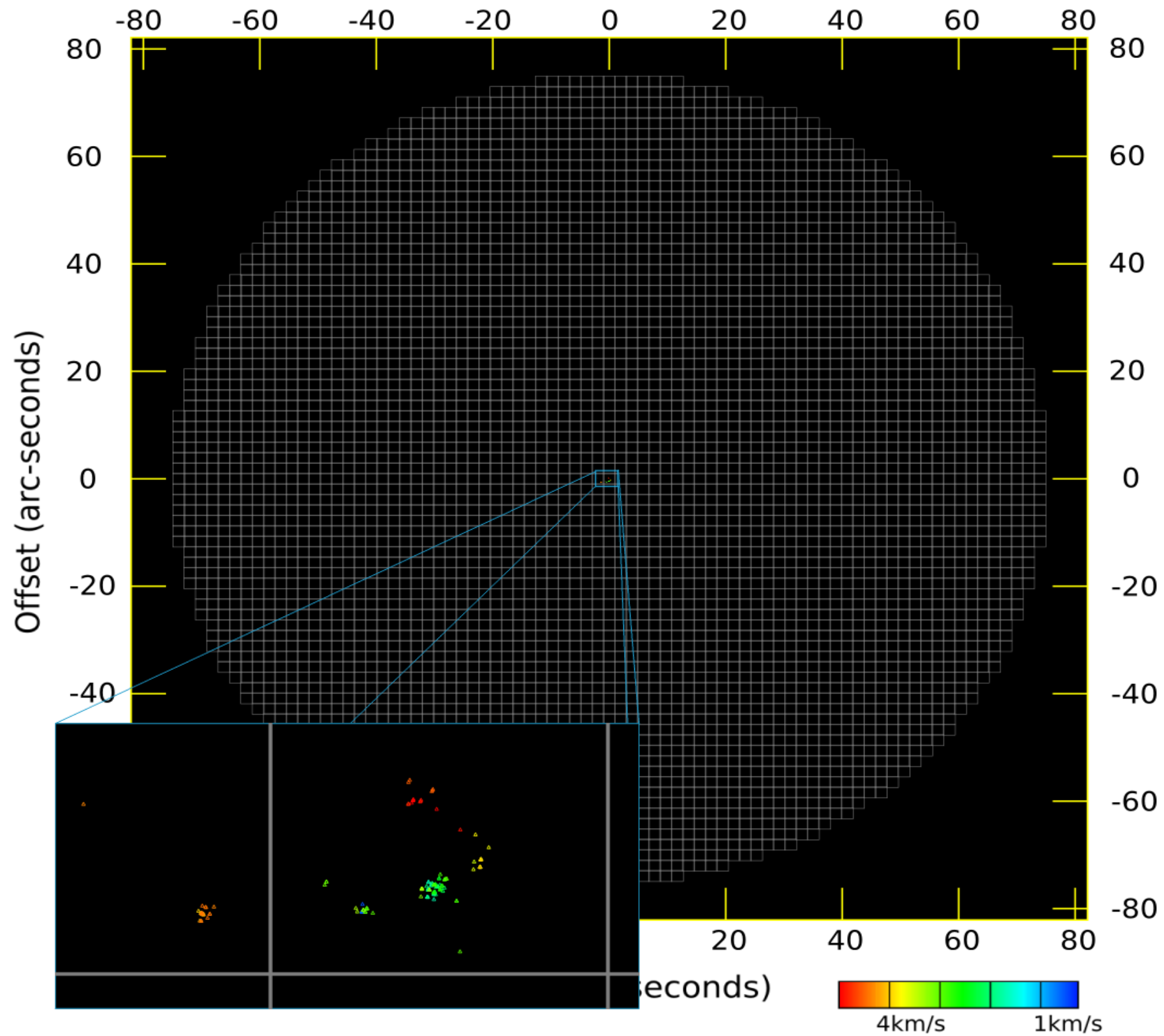
Cellsize: 0.001   Imsize: 2048   Nfields: 4669

4km/s   1km/s

At the close of play...

- ## Success aspects
  - Very interesting R&D which was hardly coordinated before
  - Brought some very good people into our field
  - Delivered reasonable amount of code/documents
  - Some users benefit, certainly from ParselTongue

- ## Could improve
  - Distributed effort needs more communication
    - Interest in wiki faded quite rapidly
  - Timing of hiring/keeping people very hard problem
  - Make users test, run and enjoy the software
    - Could benefit from some students associated with the project

- ## Will this improve in ALBiUS?
  - More partners, less money, less time
  - But rules on spending are relaxed
  - Still no dedicated manager... (to say the least)
    - but we have learned...

ALBiUS

- **Advanced Long Baseline interoperable User Software**

- **Participants: ASTRON, Bordeaux, Cambridge, ESO, JIVE, Manchester, MPIfR, NRAO, Oxford**

Status and history

- **Current RadioNet DoW is almost finished**
  - **Description of Work is a contract with the EC**
  - **Will formally kick-off on January 1 2009**
    - **Means one can start making eligible costst**

- **Ended up as 1M€ contract with 75% (hour) matching**
  - **Quite slim in actual funding**
  - **But also reduced in number and form of milestones**

- **Started as two 1.5 M€ proposals to RadioNet board**
  - **Made cut after merge in internal review**
  - **Was not too highly ranked by EC referees**
    - **Cut to 0.8M€, but reasons not quite clear**
    - **And seemed to ask to do same amount of work for less funding**
  - **Negotiated back to 1M€**
    - **Partners committed to fairly high matching**

- **Partners to continue with up to 50% matching**
  - Some in 50/50 manhours, other in finances
  - Note that there is explicit 25% matching
  - And we encouraged a modest matching on top of that
- **Convergence on 224 manmonth, was 258**

Participant name	JIVE	ASTRON	UCAM	ESO	MPG	NRAO	UOXF	UMAN	BORD	
Person-months:	26+ 18	13+ 13	12+ 10	18+ 12	6+ 0	12+ 9	12+ 9	15+ 12	12+ 9	126+ 92

- **Slicing the now much smaller cake**
  - Keep everybody fractionally happy…
  - So keeping (almost) the same EC allocation share
  - Important and sensible decision at ESO
    - Focus on a few larger assignments in calibration and data structures
  - No formal matching from MPI

Money in DoW

Manpower in DoW

Partner contributed
EC contribution

Partner Contribution
EC Contribution

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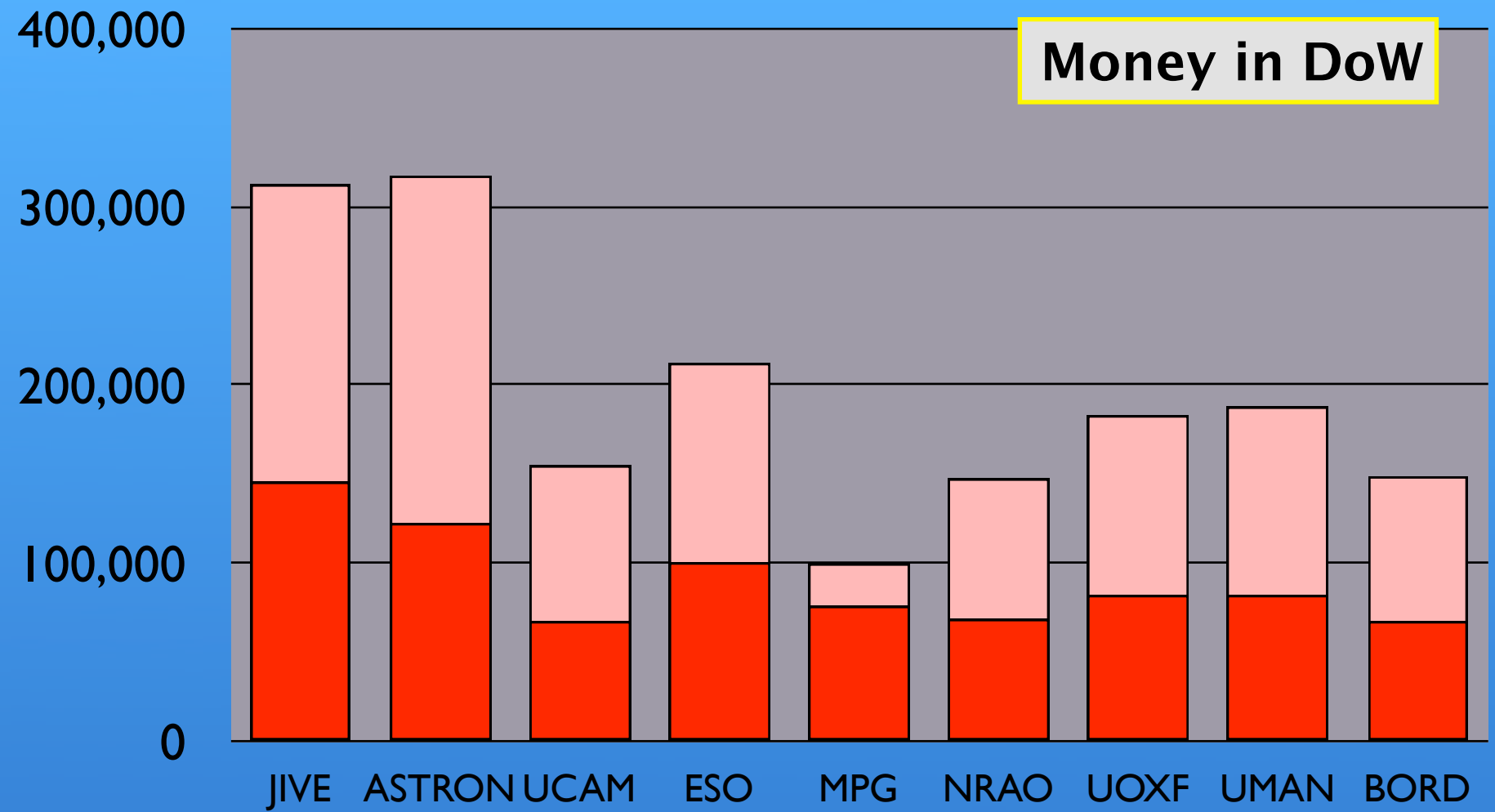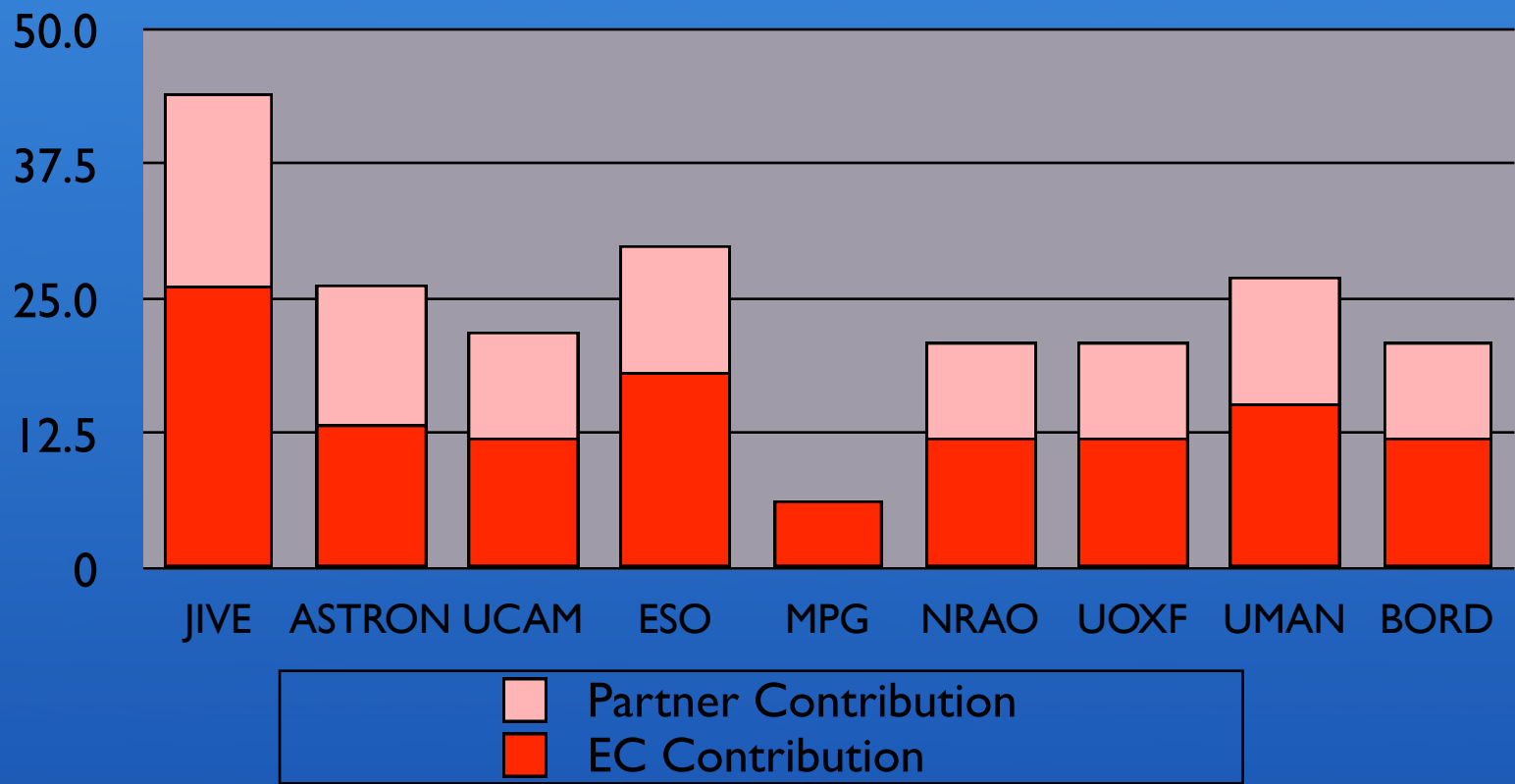
- **How do we salvage the existing algorithms for the era of ALMA, the SKA and its pathfinders?**

<div align="center">

OR

</div>

- **How can we make sure that current RadioNet facilities make optimal use of new software?**

- **WP 1: Interoperability**
  - Exploit the common Python interface of AIPS, CASA, Miriad
    - Data formats, data models, mixing calibration, ParselTongue

- **WP 2: Calibration Algorithms**
  - Fringe Fitting, needed by new instruments, new software environment
  - Image plane calibration, directional dependence and mosaicing
  - Parallel processing for calibration

- **WP 3: Automated Processing**
  - Data Quality Control: identify and correct/excise corrupt data
  - RFI mitigation
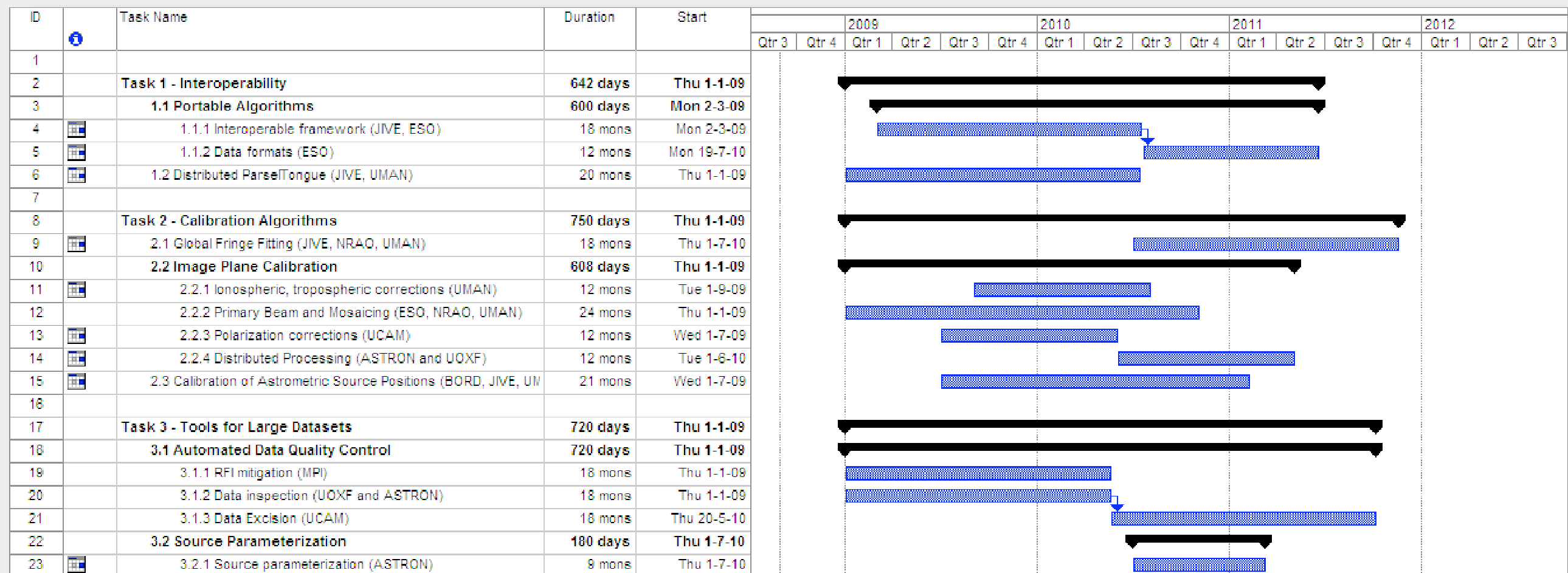 - Source Extraction and Parameterization

Workplan matrix

- ## Guiding principle: make Matrix as empty as possible
  - ### For easiest project management, and clear responsibilities
  - ### Scratch 2 subtasks as a consequence

proposal dow rev5

	task		subtask	4 JIVE	1 ASTRON	18 UCAM	15 ESO	5 MPG	23 NRAO	19 UOXF	6 UMAN	20 BORD		total
1	Interoperability			35	0	0	18	0	0	0	3	0		56
1	Portable Algorithms	1.1	Framework	15	0		6							21
		1.12	Data structures				12							12
		1.2	Distributed ParselTongue	20							3			23
2	Calibration algorithm			9	11	12	12	0	21	6	24	21		116
		2.1	Global Fringe fitting	6					15		3			24
2	Image plane calibra	2.2.1	Ionospheric/tropospheric							12				12
		2.2.2	Primary beam/mocaicing				12		6		6			24
		2.2.3	Polarization			12								12
		2.2.4	Distributed processing		11					6				17
		2.3	Astrometric positions	3							3	21		27
3	Large datasets			0	15	10	0	12	0	15	0	0		52
3	Quality control	3.1.1.	RFI mitigation					12						12
		3.1.2.	Data Inspection		6					9				15
		3.1.3	Data Excision			10				6				16
	Source Parametrisa	3.2.1	Source parametrization		9									9
		3.2.2	Source extraction		0									0
		3.3	Source Modelling		0									0
Total				44	26	22	30	12	21	21	27	21		224
proposal		EC funded		26	13	12	18	6	12	12	15	12	126	218
		partner contributed		18	13	10	12	0	9	9	12	9	92	

In DoW

- **Not much of this division work visible**
  - But reduced the deliverables to 1 per subtask
  - And only 1 or 2 per partner
  - So each partner is primary responsible for 1 deliverable

ID		Task Name	Duration	Start
1				
2		Task 1 - Interoperability	642 days	Thu 1-1-09
3		1.1 Portable Algorithms	600 days	Mon 2-3-09
4		1.1.1 Interoperable framework (JIVE, ESO)	18 mons	Mon 2-3-09
5		1.1.2 Data formats (ESO)	12 mons	Mon 19-7-10
6		1.2 Distributed ParselTongue (JIVE, UMAN)	20 mons	Thu 1-1-09
7				
8		Task 2 - Calibration Algorithms	750 days	Thu 1-1-09
9		2.1 Global Fringe Fitting (JIVE, NRAO, UMAN)	18 mons	Thu 1-7-10
10		2.2 Image Plane Calibration	608 days	Thu 1-1-09
11		2.2.1 Ionospheric, tropospheric corrections (UMAN)	12 mons	Tue 1-9-09
12		2.2.2 Primary Beam and Mosaicing (ESO, NRAO, UMAN)	24 mons	Thu 1-1-09
13		2.2.3 Polarization corrections (UCAM)	12 mons	Wed 1-7-09
14		2.2.4 Distributed Processing (ASTRON and UOXF)	12 mons	Tue 1-6-10
15		2.3 Calibration of Astrometric Source Positions (BORD, JIVE, UM	21 mons	Wed 1-7-09
16				
17		Task 3 - Tools for Large Datasets	720 days	Thu 1-1-09
18		3.1 Automated Data Quality Control	720 days	Thu 1-1-09
19		3.1.1 RFI mitigation (MPI)	18 mons	Thu 1-1-09
20		3.1.2 Data inspection (UOXF and ASTRON)	18 mons	Thu 1-1-09
21		3.1.3 Data Excision (UCAM)	18 mons	Thu 20-5-10
22		3.2 Source Parameterization	180 days	Thu 1-7-10
23		3.2.1 Source parameterization (ASTRON)	9 mons	Thu 1-7-10

Deliverables

Del. no.	Deliverable name	Lead Partner	Deliver date
8.1.1	Final report on calibration of pilot experiment using interoperability framework	JIVE	21
8.1.2	Release of distributed ParselTongue	JIVE	21
8.2.1	New implementation of Global Fringe Fitting algorithm	NRAO	36
8.2.2	Direction dependent ionospheric, tropospheric, calibration to test data set	UMAN	21
8.2.3	Software for mosaic imaging including primary beam correction	ESO	25
8.2.4	Report on image plane polarization calibration effects	UCAM	19
8.2.5	Final report on the implementation of algorithms for image plane calibration in a distributed environment	ASTRON	30
8.2.6	Final report on new algorithms and observing strategies for astrometry	BORD	28
8.3.1	RFI mitigation software	MPI	19
8.3.2	Final report on Data Quality algorithms and excision methods	UOXF	36
8.3.3	Final report on models for extended sources	ASTRON	28

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What does it actually imply?

- **Hopefully what the partners want!**
  - Must develop tasks that are in the interest of participants
    - Don't expect any dictatorship (this time :-)
  - Have quite some room in the description
    - Not explicit about platform

- **Needs some creative thinking**
  - Especially on tasks that have multiple partners
  - Hopefully including all (new) staff

- **Will organise a kick-off meeting**
    - Presumably first week of March
    - Back-to-back with RadioNet kick-off (same week, the Hague?)
  - With ample room for brainstorm session

  - Reserve March 2-3, Dwingeloo in your agenda

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Management issues

- After a short interregnum with Cormac Reynolds

- **Leadership defaulted back to Huib van Langevelde**
  - Will be assisted by Giuseppe Cimo
  - and Aukelien vd Poll for administation

- **Communication is via a personnel e-mail list**
  - Will have to improve shortly
  - Please check that your local people are on
  - Need a separate list for management types
    - To discuss euros and sensitive issues (e.g. personnel info)

- **Partners should start hires as soon as RadioNet DoW is final**
  - Or earlier, I guess
  - And start writing hours, making expenses, travel, code and deliver