

Closing Ruminations on CALIM 2010

Dwingeloo, 22-27 Aug

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Giving a Conference Summary

- Not a reminder of what has been said
 - You either did not listen
 - Or you are not ready
- Should contain a measure of self-congratulation
- Identification of the Great Trends
 - Sketching the landscape
- But: Inevitable personal filter/bias/prejudice
 - Which can be a Good Thing (in small doses)

CALIM History

- I. Dwingeloo (2005)
- II. Cape Town (2007)
- III. Perth (2008)
- IV. Socorro (2009)
- V. Manchester → Dwingeloo (2010)
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- VI. Pune? (rethink format?)

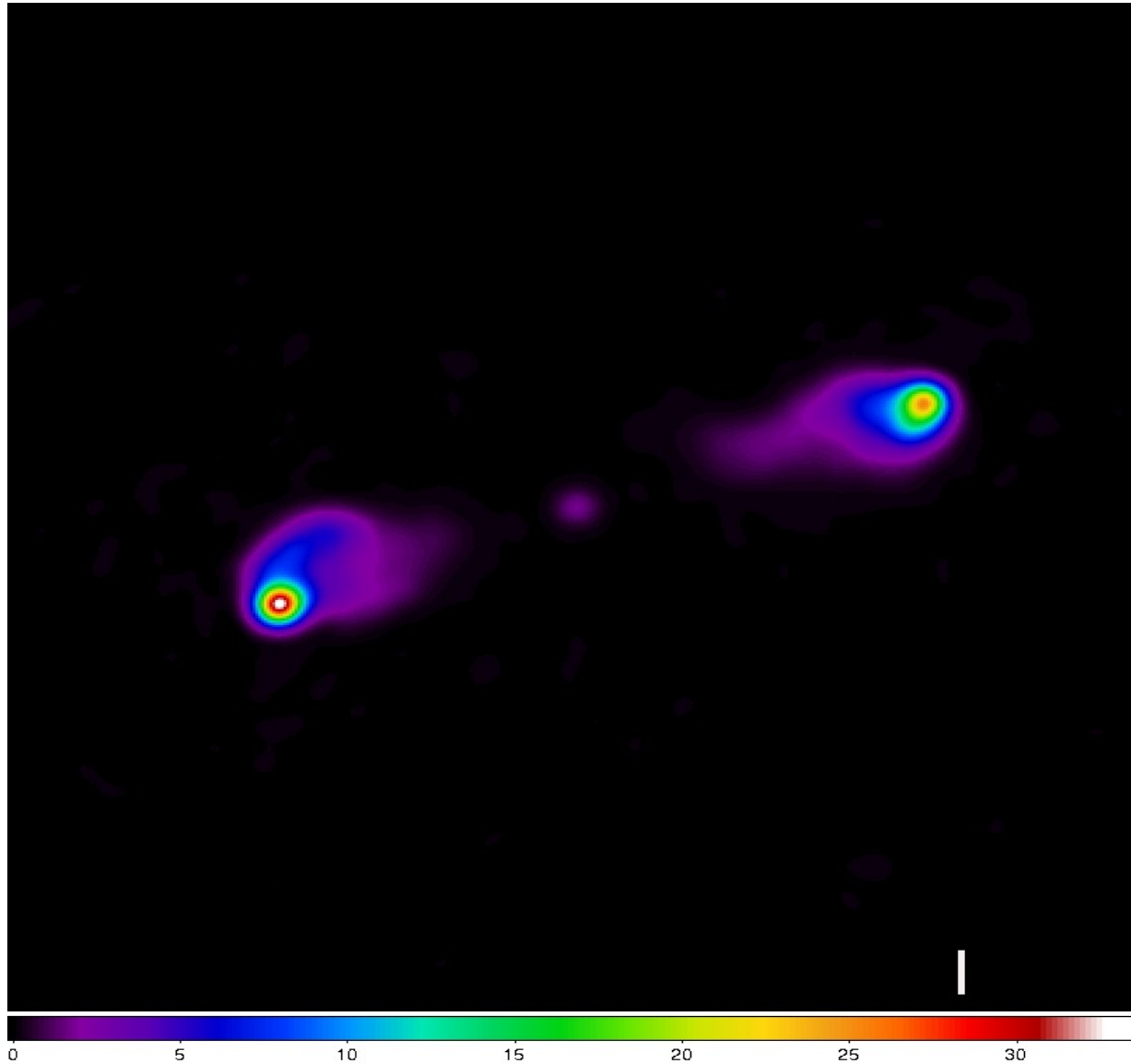
The Goals of CALIM

- Protecting our Leaders against themselves
 - Dynamic Range (60, 70, 80, ... 1000 dB)
 - Array Configurations (figures of merit)
 - Station technology (AAs, dishes, PAFs, derotation)
- Generating solutions as a Community
- Launching the Next Generation
 - Provide direction, tools, jobs, freedom, ...
- **I think that we have done well this CALIM**

CALIM evolution over 6 years

- There is a clear monotonic trend, which started with AIPS++ (1990) and is sustained with CALIM
- Less unsubstantiated hand-waving by dinosaurs
- Increasing use of the Lingua Franca (RIME)
- Increasing focus on shared problems
 - DDE's (estimation and application)
 - Keeping our heads above the data stream
- More collaboration and (friendly) competition
- More looking at data/plots/maps together (tools!)

The CALIM 2010 Image



Cygnus A (EVLA)
DR 17.000:1

Sarod Yatawatta
Rick Perley
Tony Willis

MeqTrees calibration
CASA Imager

ASTRON/JIVE Image of
the Day, 26 aug 2010

The Practical List

- This list was distributed beforehand to all the speakers that “set the scene” on the first day
- They all addressed it (more or less)
- I am NOT going to review it here
- The list should be updated and the exercise be repeated at future CALIMs

The Fundamental List

- Application of DDE's
 - Unitarity of the Jones matrix?
- Complementarity of Yin and Yang (see below)
- The availability of information (beacons etc)
- Equations vs unknowns (minimize the latter!)
- The number of passes through the uv-data (I/O)
- The number of Major Cycles (uv-plane/image)

The Fundamental List (II)

- ..
- ..
- ..
-
- This list should also be updated and discussed at future CALIMs

Sketching the Landscape (I)

The 3 Pillars

- Calibration
 - Complicated and sexy: Benign competition
- Imaging
 - Sexy but 'simple': Actual worldwide collaboration
- uv-data handling (incl tools)
 - Unsexy but crucial: Let's get on with it!

Sketching the Landscape (II)

4 Generations of Calibration

- 1GC (<1980): Instrumental Stability (1:100)
- 2GC (>1980): Selfcal, DIE's (a dizzy ride)
- 3GC (>2010): DDE's (1:1.000.000+)
 - In the process of being implemented
- 4GC: “Statistical Analysis of Residuals”
 - This will be REALLY needed in a few years time

This CALIM: Program Structure (reflects the Issues of the Day)

- Setting the Scene (the practical list)
- Progress in Imaging
- Direction-Dependent Effects (DDE's)
- Phased Arrays
- HPC and uv-data handling
- Simulations
- Miscellaneous (see below)
- Discussion sessions (should be evaluated)

“Miscellaneous”

- Station Calibration
- RFI mitigation
- Visibility Statistics
- Measurement Equation
- Solver accuracy
- ...
- **NB: Such contributions should be encouraged because they may grow into Major Issues**

Everyone has EJones Problems

- Primary beams are not identical
- They are polarizing
- They change in time and freq
- They are asymmetric and rotate on the sky
- Open-loop estimation is fast, but limited
- Closed-loop estimation is expensive
- **The good news: It has been demonstrated by Smirnov that mJy field sources may be used**

The Bottom Line

Show me your beamshape
And I shall tell you who you are

Application of DDE's

- This is one of the most urgent issues
- W-coordinate, E Jones, Z Jones, F Jones
- Bhatnagar et al (AWProjection, both directions)
- Abdalla et al (forward application, UVBrick)
- Only when this is solved can we say that AWP is “50 faster than faceting” (Bhatnagar)

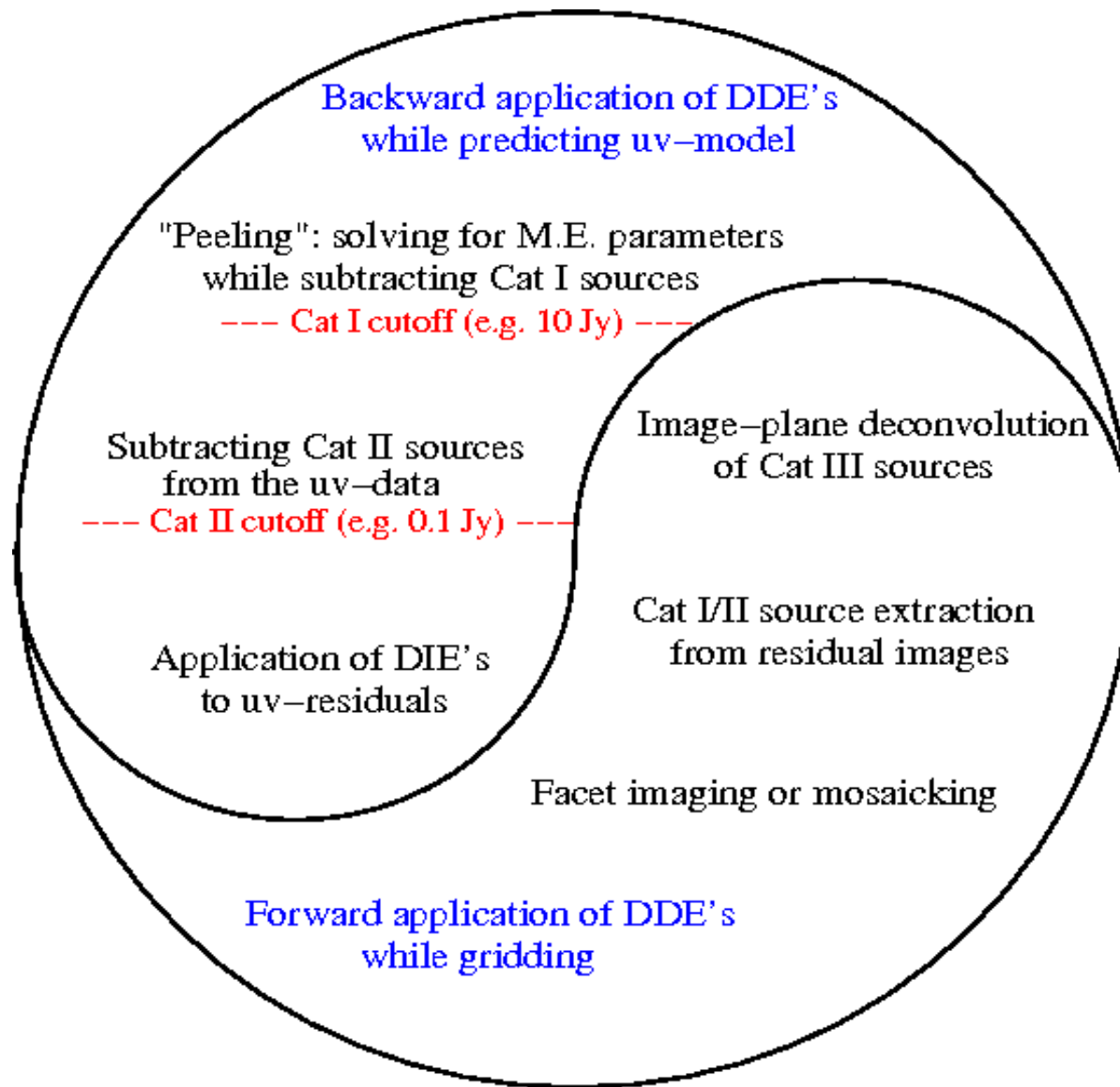


Diagram generated after CALIM 2009 in Socorro, and used as poster for the 3rd Generation Calibration workshop in Nancay (France) in Oct-Nov 2009 (It is not entirely up-to-date, but emphasizes the complementarity)

Yin and Yang (complementarity and trade-offs)

- The “MeqTrees” approach
 - Solving (as much as possible) in the uv-plane
 - Subtracting (as much as possible) in the uv-plane
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- The “CASA” approach
 - Solving (as much as possible) in the image plane
 - Emphasis on gridded operations (efficiency)

Steven Weinberg says (to the New Generation)

- Jump in at the deep end
 - listen to others, but do not take them too seriously
- Look for rough water
 - This is guaranteed for CALIM → SKA
- Don't be afraid to lose time
 - Yeah, right, if your betters give you the room...
- Study the history of your profession
 - Progress does NOT follow the philosophers of science

Fueling Collaboration

- The CALIM-related Colloquium (now):
 - “Mob Calibration”
 - a.k.a. “Feeding Frenzy”
- Presented by some of the most gifted performers in our field
- With Audience Participation
- Drinkies afterwards (for attendees only)

See you all next year