How to organize the global network?
Introduction to a "town meeting"

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GWIC mandate to explore global network issues

At its last meeting (July 2004) GWIC created a committee

> "to propose how to refocus the current set of bilateral arrangements to promote global exchange. The committee should also discuss the coordination of running times."

Members:

- » Masa-Katsu Fujimoto
- » Benoit Mours
- » Giovanni Prodi
- » Bernard Schutz
- » PRS (chair)

Progress wanted before June 2005 Amaldi meeting.

Critique of present system

We should be proud of how far our field has progressed, and also of the collaborative work that has been organized.

However, the system is far from perfect.

- There are so many bilateral agreements that it is hard to keep them all reconciled.

- Should data always be analyzed in pairs?

    In many cases, analysis of all data together would make more sense.

- We are still at the beginning of knowing, even at the technical level, how to use a heterogeneous global network.

Possible actions

There are several things that we might think of doing:

1. Make all bilateral MOUs public and easily available.
2. Organize a full technical study of various possible modes of operation of a network.
3. Set up procedures for checking a detection claim
   that might be put forward by a single project or portion of the global network.
4. Explore how to structure a fully global collaboration.

Technical study

Much work has already been done on network analysis, at the individual project level and within several of the bilateral agreements.

Nevertheless, we are far from a complete understanding of the best way to use a network.

Among the outstanding issues:

1. Understand the optimum way to do coincidences,

   Given a mix of antenna patterns, noise levels, bandwidths, …

2. Explore how to cross-calibrate different instruments.

3. Learn how to extract scientific information from data.

We should make this a priority.

Checking a detection claim

When a detection claim is put forward, we'll want it to have been checked by all relevant detectors.

How to plan for this? Some issues:

- » "Believability threshold" to be crossed before asking for a check
- » Is it obligatory to ask others to check a claim?
- » Confidentiality
- » Authorship:
  - on original paper or separate paper describing the check?
- » How to deal with lack of unanimity of interpretation
- » What sort of statistical threshold should we require?
- » What obligation is there for original authors to take advice from the rest of the network?
- » How much independent work (and time for it) should be allowed or encouraged?

Issues for a global network

- **Who is in the network?**
  - Is it everyone whose detector is operating, or only those with sufficient sensitivity for a particular search, or …?
- **What body would make plans for searches? Who would carry out the work to make them happen?**
- **How would the contributions from individual detectors be checked?**
  - Coordinated "mock data challenges"?
  - What kinds of software tests are required?
- **How would we determine the statistical strategy and standards of a global search? What will be the criteria for claiming a detection? To what extent can they be agreed to in advance?**
- **By what procedure would results be approved?**
  - Do people join the network "up front", and then abide by some decision-making procedure (still to be invented), or does each project make an independent decision to approve individual results?
  - Can data be withdrawn retroactively in the event of disagreement over the results of an analysis?

Where do we go from here?

Straightforward:

- Collect collaborative MOUs on the GWIC web site.

- GWIC should also set up a repository for science run information.

Challenges:

- Organize joint technical studies of network analysis.
  What can we do before the Amaldi meeting?

- Start discussions to plan for global check of a detection claim.

- Can we see our way to a complete global network?

What steps can we take to face these challenges?