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JMMC

JMMC/ESO JOINT PROPOSAL ON CALIBRATORS AND INTERFEROMETRIC DATA CALIBRATION

Gilles DUVERT (gilles.duvert@obs.ujf-grenoble.fr)
Sylvain LAFRASSE (sylvain.lafrasse@obs.ujf-grenoble.fr)

Author : Sylvain LAFRASSE Institute : JMMC	Signature : Date : 06/03/2008 SUBMITTED
Approved by : Gilles DUVERT Institute : JMMC	Signature : Date : 06/03/2008 APPROVED
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1 Introduction

Following the ESO/JMMC Joint Advisory Committee of 26 Oct 2007 it was decided to:

1. Set up a closer collaboration between the JMMC calibrator group and the ESO science staff on the problem of calibrators for the VLTI and its future evolutions. It wass proposed to institute a yearly joint JMMC-ESO workshop, whose first venue will be dedicated to Calibrators (to be held between March and June 2008). M. Wittkowski and D. Bonneau are proposed to chair this workshop. The workshop should permit the sharing of experience among attendees and provide recommendations on the best way to find, certify, use, and handle data calibrated with, calibrators.
2. Work on a preparation tool for calibrator search, fulfilling a list of requirements described during the meeting.

This Document is a report on the current status of both actions proposed.

2 The workshop

The workshop should focus on two topics:

1. Science aspects: what is a calibrator, and what kind of calibrators are needed for each VLTI instrument and/or instrument mode. How to choose the suitable calibrators. How many calibrators for a science observation. What additional observations are eventually needed, and how to get these obervations. What are the recommended observing procedures, depending on the science needs. JMMC contact: Daniel Bonneau, ESO contact: Markus Wittkowski.
2. Software aspects: to review the proposed design for the tool developed in collaboration by ESO and JMMC. JMMC contact Gilles Duvert, ESO contact TBD.

The organising committee (DB and MW) will insure that the number of workshop attendees will be kept small and well-focussed on the outcomes. A possible location could be Nice. The date should be around May 2008, before the SPIE meeting (23-28 June) and VLTI school (12-13 June).

3 The preparation tool

The preparation tool for calibrator search:

The JMMC proposes **to handle all necessary modifications** of its current SearchCal (hereafter SC) tool to make it **fully customizable** for dedicated use by any Interferometric Facility and ***interoperable*** with other VO compliant tools. JMMC is particularly interested in collaborating with ESO on such modifications.

These changes shall permit to add more easily, in a gradual way adapted to the evolution of the instruments, all external functionalities required by the interferometric facility which do not pertain to the core task of SearchCal.

The current architecture of SC is depicted in fig.1.

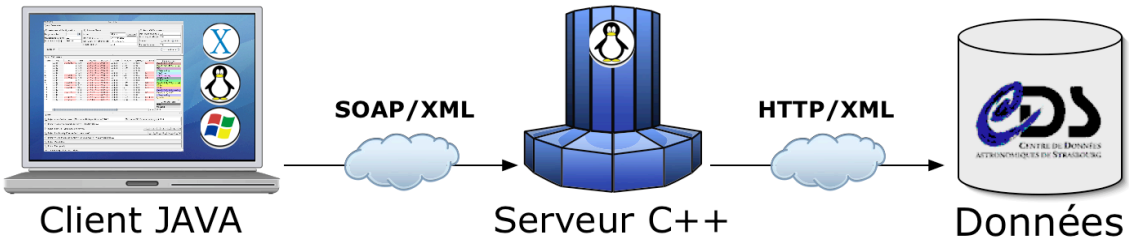

Figure 1: Architecture of SearchCal

The list of requirements and draft or software solutions follows.
Coverage of the requirements by the JMMC tools, proposed evolutions and comments are typed in *italic red* below.

3.1 ESO Data Management Requirements

1. Tool insures sufficient (TBD) spatial density of calibrators for MIDI and AMBER use : *Covered by current implementation of SC server.*
2. Calibrators measurements by ESO instruments serve to augment/update a list of "Bad Calibrators", and a list of 'known" calibrators associated with and ESO 'quality tag'[1]: *need, exact process, shall be discussed in the Workshop*.
3. Tool will use the "bad" and "known" calibrator list in its calibrator finding algorithm. *SC will be augmented with the possibility to retrieve optional list of calibrators (format TBD), remove the objects found in the bad calibrator list (TBC: bad calibrator list definition should permit to avoid identification problems.), and addd or replace 'good' calibrators.*
4. Tool can use local databases, like a local fixed list of calibrators*.: in the first version implemented at ESO, tool will use a fixed list of calibrators (format TBD)*
5. Calibrators submitted by astronomers are completely described (e.g., star diameter) to be checked for OB validity before observation and used effectively for absolute calibration of Science data at Quality Control level.[2]: *SC gives this description. The methods by which Quality Control uses this information are related to req. [8]*
6. Tool works (at least in some mode) withoud need of an internet connexion to web databases. *In a first implementation, SC will be tailored to use a fixed list of calibrators (see [4]). JMMC will provide the required interoperablity enhancements in SC, if any, needed to use local VO databases/services, thus fulfilling this requirement.*
7. Tool is Java-based (Java application, not applet).We note that his is not a user requirement in itself (it is a software specification). *Although SC client[3] is a Java application, the underlying User Requirement should be further discussed with a knowledgeable ESO representative.*
8. Tool output is useable as P2PP input *: A VO-compliant tool will be developed to digest the VOTable produced by SC and populate the P2PP tool. According to the subsidiarity requirement [15], this tool could be developed on the ESO side.*

[1] Functionnally, this is mainly an internal ESO issue, that will benefit from conclusions of the JMMC/ESO workshop on calibrators.
[2] This requirement applies only if the tool is the only origin of calibrators submitted by astronomers at P2PP stage 2.
[3] The server is in C/C++ compliant with JMMC's control system software.

9. Tool can be used in expert mode (e.g.,Paranal use on the spot by AOD – "expert mode" to be defined further): *JMMC's calibrator group believes that "Expert mode" is already present in SC. A precise definition of the envisioned "expert mode" shall be written in common with the ESO correspondent before further action.*
10. Tool presents all additional information (calibrator observability, dependence on baselines, effect of shadowing by telescope enclosures, localisation in time and space (Paranal, specific baselines), limiting magnitudes for selected focal instrument) needed to help user select the calibrator in accordance with observational constraints.: *This list of requirements will be fulfilled by the interoperability and customisation methods to be implemented in SC. The software solutions shall be refined in further discussions at technical level with a knowledgeable ESO representative.*

3.2 Science User Requirements

11. Use of IAU WG's bad calibrator list see [2]
12. Useable outside ESO see [6] and [15]
13. Input can be triggered by P2PP: *fulfilled: SC can already be operated (called, query values entered) externally.*
14. Output Fills P2PP (creates Obs ?) see [8]

3.3 JMMC Requirements

15. tool suitable for all interferometers and focal instruments.: *We propose a 'subsidiarity' approach: functionalities deemed applicable to a large fraction of existing or envisioned interferometers users shall be developed by JMMC, if they are not already available as VO tools developed elsewhere Functionalities specific to a particular interferometer shall be developed separately as a tool interoperable with SC. In the case of equally possible software designs, the design based on the interoperability of dedicated VO tools shall be preferred.*
16. no downgrading of the existing SearchCal tool.
17. Tool architecture permits easy upgrades triggered by science group contiunous R&D. : *fulfilled by subsidiarity approach, see [15]*
18. quality control results on calibrators (especially calibrators found "bad") are communicated to the JMMC science group for study. *To be refined during the Workshop.*

4 Actions

The JMMC asks ESO for naming at least one technical expert who will be part to the SearchCal project, participate to all relevant progress meetings, report to ESO and is able to take decisions about the sharing of the remaining development (following concepts in [15]). Once this/these persons are known, collaboration and work can start immediately.

The agenda for the workshop must be finalized by DB and MW.