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05-04-2005 EGGS videoconference Minutes.

Present: La Silla: J. Alonso, W. Eckert, M. Sterzik, G. Lo Curto
Garching: G. Avila

Agenda:

1 - Fiber splicing and splicing tools status.
2 - Discuss the feasibility studies, tests and inquiries done so far for the fiber head design, tolerancing, manufacturing, assembling and alignment procedures.
3 - Optical Design Document delivery date.
4 - Mechanical Design Document delivery date.
5 - FDR date.
6 - Is it realistic to plan the technical commissioning for July 17, 2005?

Summary:

1) There is no need for the support of the splicing tool.
We need 2 pieces (one per fiber), + 1 for test in Garching
+ spares: 6 pieces.
Splicing tools can be manufactured in the next week
and sent to Garching by April 21st.
We should have very soon from Gerardo Avila the
result of a splicing test with a ceramic ferule
to check on the quality of the cut.
After splicing and for operations, the two pieces
of the fibers can be simply put in contact,
to allow easy disassembly. However not to decrease the
efficiency of the system it should be avoided as much
as possible to re-open the fibers at the splicing point.
The two ends of the spliced fiber can be glued, or
optical gel can be applied (need maintenance).
The efficiency loss in the splicing might be
affected by the inclination of the fiber within
its jacket. This paramter varies slowly along
the fiber, and cutting the fiber until the optimum
fiber-jacket alignment is reached is not possible.
We have no control over this parameter.

2) We have no feedback yet from external companies
about the laser hole drillings in the mirror plate.

Drilling tests were performed in La Silla to verify
the feasibility of clean and accurate 200 microns holes
on a Nichel plate 100 microns thick. The holes were not
drilled perpendicular to the surface of the plate, but
with an angle such to stay parallel to the optical
axis once the fiber will be mounted on the telescope.
This is done to avoid efficiency losses due to
unwanted collimation effect by the plate.
The result of the test was very positive, the holes
are extremely clean and perfectly round in shape.
The plate was not damaged by the operation.
Pending quotations from two companies it was decided
that "in house" drilling of the plate would be
the preferred way to go.

Tolerances:
  fiber - telescope pupil: 10 microns
  rod lens - plate hole: 20 microns
  These tolerances were computed considering
  an efficiency loss of 5% in each case.
  Parallelism: 5'.
  Focus: +-100 microns.
  Actually the rod lens - plate hole tolerance
  should be of the order of 10 microns. Indeed the
  fiber core and the jacket might be decentered by
  5-10 microns and this was not taken in the balance when
  computing the tolerance. Moreover the approximation used
  to compute the 20 microns rod lens - plate hole
  tolerance breaks for seeing below ~ 1.4" and in this case
  the tolerance is overestimated.

Focus:
  due to the focus tolerance and the accuracy of the machining
  it was suggested to avoid the focus adjustement. This might
  reduce alignement and parallelism (between the two fibers, tilt)
  problems. This option should be considered.
  In case focus adjustment is not dropped the full range
  should be less than 350microns semiamplitude.

Alignement:
  the main difficulty seems to be the alignment of the lens with
  respect to the fiber. For this a special tool is needed.
  Some examples of this tool already exist in Garching.
  A dedicated tool for EGGS should be built (drawings
  specifications and mode of use to be included in the
  documentation). The accuracy expected for such alignment is
  of 5 microns, better than the 10 microns tolerance.
  The lens-fiber alignment will be performed by projecting

the light beam form behind the fiber through the lens to a screen one meter apart. The lens will be glued to the fiber. Another tool is needed to align the fiber within the ferule with the plate hole. It should be designed on purpose. This tool should be accurate enough to guarantee the alignment within 10 microns. Such an accuracy is deemed possible to achieve. The fiber - plate hole alignment will be performed after having placed glue on the surfaces. The glue needs two hours to polimerize, and this is enough to complete the procedure.

Parallelism:
technically it is possible to provide a parallelism between the two fibers and between these and the optical axis to better than 5'. This seems sufficient but should be double checked. Like HAM, EGGS will not have tilt adjustment. Parallelism might be affected by the alignement procedure and the fixing glue.

All alignment procedures should be preformed in the laboratory after splicing of the fiber in the dome floor. After alignement, the splices of the fibers will be joined again.
It would be useful to have more spare lenses.

3-4) All documents should be ready by April 30th at the latest. The complete new head design should be sent by W. Eckert to G. Avila by April 15, preferibly on the 14th. Gerardo will comment by April 20th.
Missing documents:
- modified fiber design with alignement proceudres
- optical analysis and tolerances.
- commissioning plan

5) The Final Design Review should be fixed in mid May after availability of the most involved persons has been confirmed.

6) Technical Commissioning: starting July 17th. It was considered realistic, although ambitious, to reach the sky by this date. Gerardo Avila will be in La Silla to help with head alignement: 10 days, arriving ~ July 5th. All components have to be ready by this date.