LGS Diagnostics
Anna Moore
September 25th 2006

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Summary

The LGS diagnostics under design will measure (based on CIN 609 and private note from Ed Kibblewhite):

At Coude:

- Energy per pulse589nm (or HeNe for test during daytime)
- Far field 589nm (or HeNe) image
- Shear plate for collimation (visual + camera)

At LLT:

- Energy per pulse of 589nm (or HeNe for estimating throughout of BTO during daytime?)
- Far field 589nm (or HeNe) image
- Near field 589nm (or HeNe) image
- Sky viewing camera with following modes:
    - Wide field image star infinity (for Hal's alignment)
    - Narrow field image star infinity (a blow up of a star profile)
    - Secondary at infinity (for Hal's alignment)
- 10 by 10 Shack-Hartmann wavefront map of 589nm (or HeNe)

Note: system will be tuned for 589nm response for this run (if HeNe response is detected within range for all the devices then it's a bonus). Schott RG630 filters will be used throughout.

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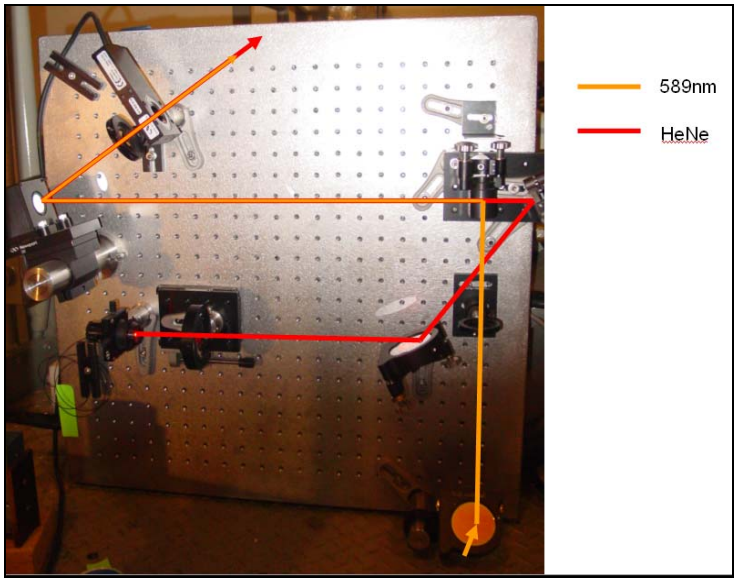
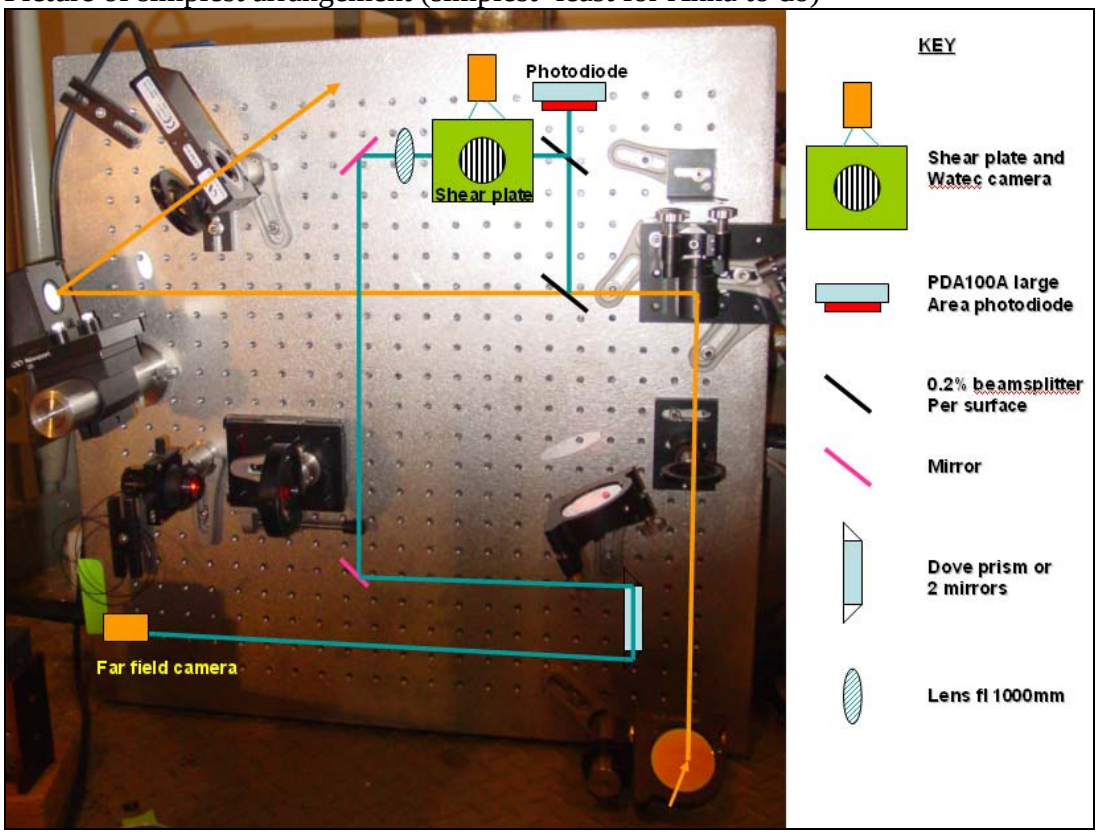
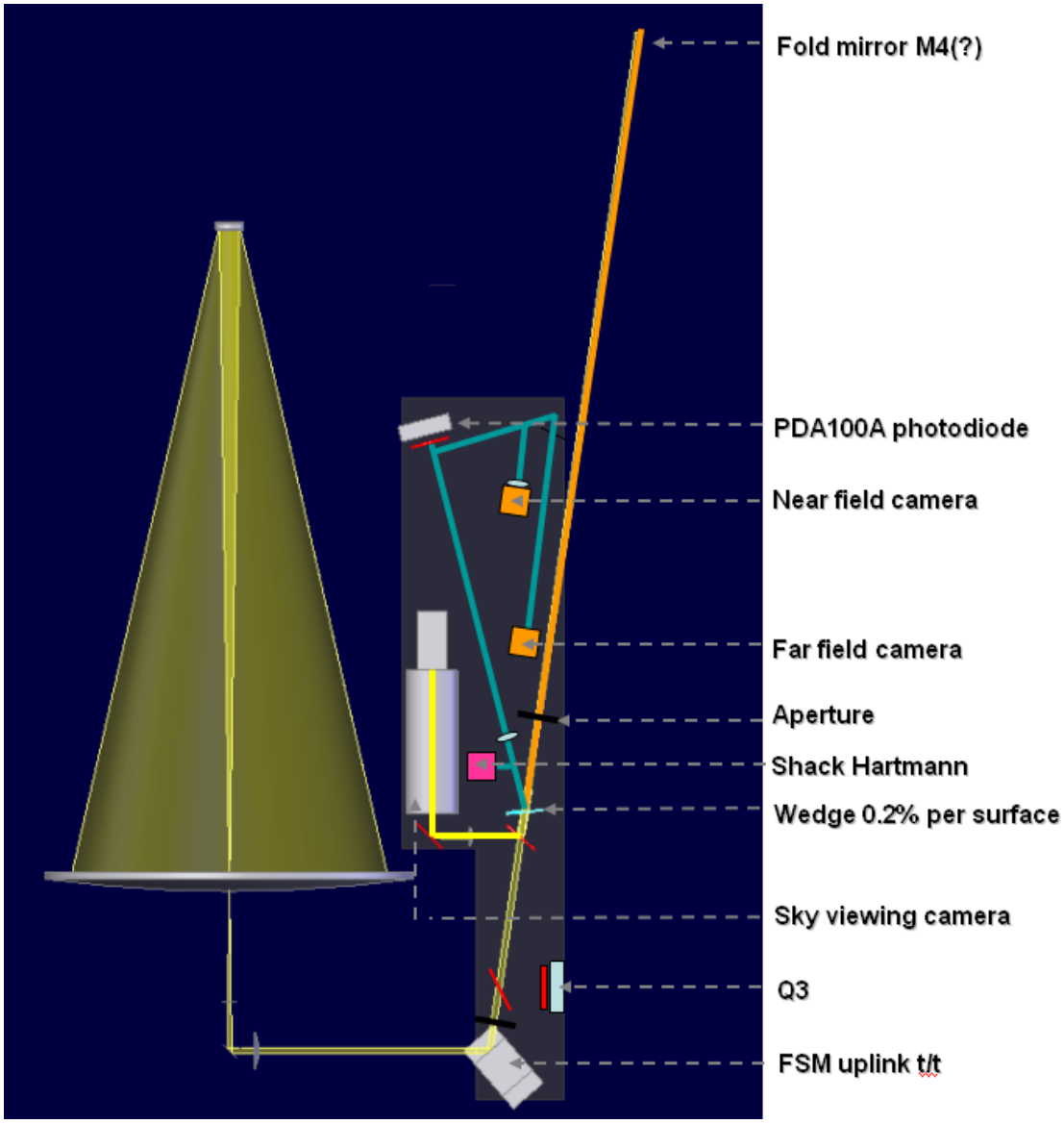
At Coude



Picture of simplest arrangement (simplest=least for Anna to do)



At LLT



Basic layout of LLT diagnostics. Black optical bench will be mounted to mirror cell of LLT (not shown).

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Cabling and data transfer

Tried to use current cabling existing at 200":

- There are (27) 50-ohm coax lines, (12) 62.5u multimode fiberoptic lines, and (120) general-purpose copper conductors at the prime focus cage.
- All the fiberoptics have ST-type connectors and run to the Cass cage, whence they can be routed to the computer room (CR).
- Six of the coax have BNC connectors; they run to Cass and can be continued to the CR. Fourteen coax have specialized Amp "coaxicon" connectors, but breakout cables can convert these to BNC-- these also run to Cass and potentially to CR. and seven coax run directly to CR.
- The plain conductors, while probably not of interest, run either to Cass or CR.
- It appears that LLT currently uses up to eight of the coax for existing functions, and none of the fibers.
- The cabling distance PF<->CR is ~100meters.
- We currently have (14) 50-ohm coax lines between coude and the computer room. No fiberoptic... but it is a short run and we can run some F.O.cables if that is needed.

Suggested cabling method:

Coude to computer room:
Requirements:
- 2 analog cameras
- 1 photodiode analog output

→ Use 3 × 50ohm lines

LLT to computer room:
Requirements:
4 analog cameras
1 photodiode analog output
→
1) Analog to GigE IP engine (Pleora) located at prime focus (up to 6 analog inputs, 2 simultaneous)
2) 1000BaseT(GigE)->1000Base-SX(short wave optical fiber) converter located at prime focus (arrived)
3) 100m of 62.5 multimode fiber to computer room
4) 1000Base-SX->1000BaseT converter located in computer room (arrived)
5) GigE into PC PCI card (Patrick has supplied a PCI single GigE card for testing)

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Control computer

FOR THIS RUN ONLY:

AMM will use her spare desktop, modified by Patrick to have:

- Windows XP (done)
- GigE card (a few ports would be good, we have access to Patrick's single GigE pci card for testing now)
- Basic data acquisition card (at least 2 inputs, 50-100kHz sampling over say 0.1s)

Location:
This PC will be located in the computer room at the 200" (as far as I am aware). We need access to the fiber optic cable from the prime focus and coax from coude. Comments?

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Questions from Anna…

1. Can LLT FSM (M5?) be repositioned:
    Such that it is mounted on the opposite side of the plate and
    So that it is at the LLT exit pupil (18mm away from the LLT mirror cell from it's current location?

2. Do we really need a laser sync for this run?

3. Would be great to have 2 monitors for display in the data room (19inch- Dell are $250 each) connected by long VGA cables to the computer room. AMMs pc has dual monitor graphics card, should be easy to set-up. Let's not go for keyboard link to pc from data room for this run. Any issues?