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Status of Pellet Tracking System

Some (FP7-HP3 WP20) recent activities:

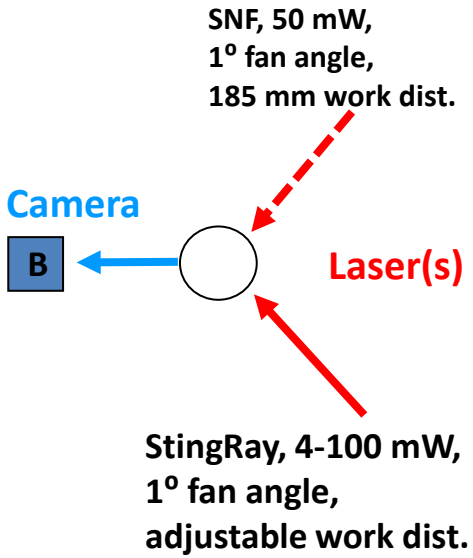
- **High efficiency pellet detection** — *Laser studies*
- **Pellet track processing and optimization of pellet detection ...** — *PhD thesis (AP Jan15)*
- **Multi-camera readout system.** — *UPTS tests*

UPPSALA team

Senior researchers: Hans Calén, Kjell Fransson, Pawel Marciniewski,
PhD student: Andrzej Pyszniak
Engineers: Carl-Johan Fridén, Elin Hellbeck, Dan Wessman

Project supported by EC FP7, FNP(eu-MPD) and SRC

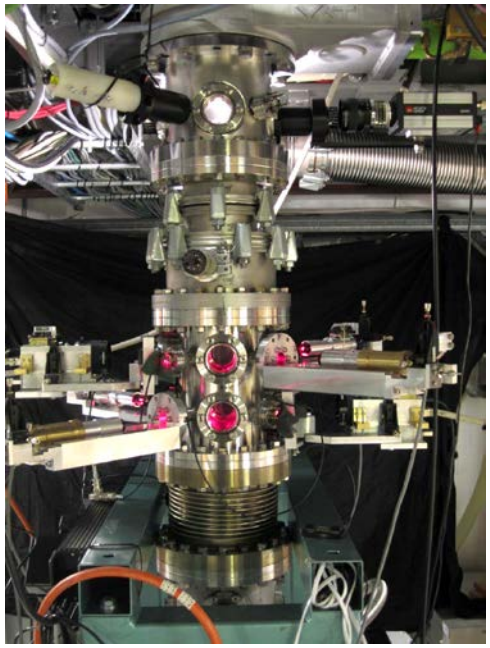
Illumination conditions.

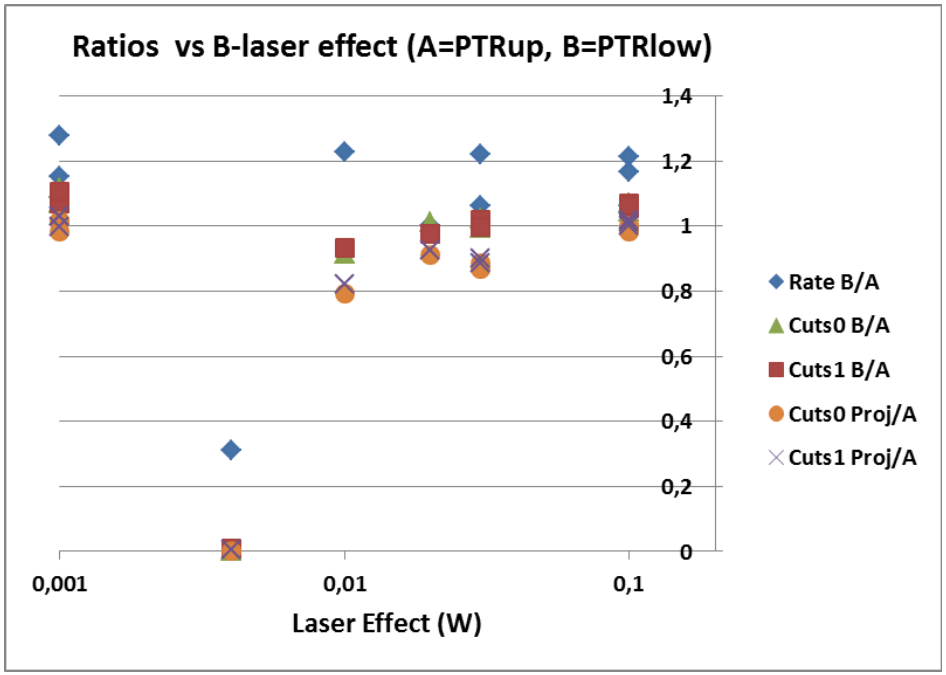


New stronger lasers with variable power allows for measurements of efficiency curves (Nov 14).

By comparing pellet rates at the two levels and the number of reconstructed tracks for different power settings one can get an estimate of the illumination efficiency.

At a laser power of 30 mW the efficiency curve reaches a plateau (at ≈ 95%)





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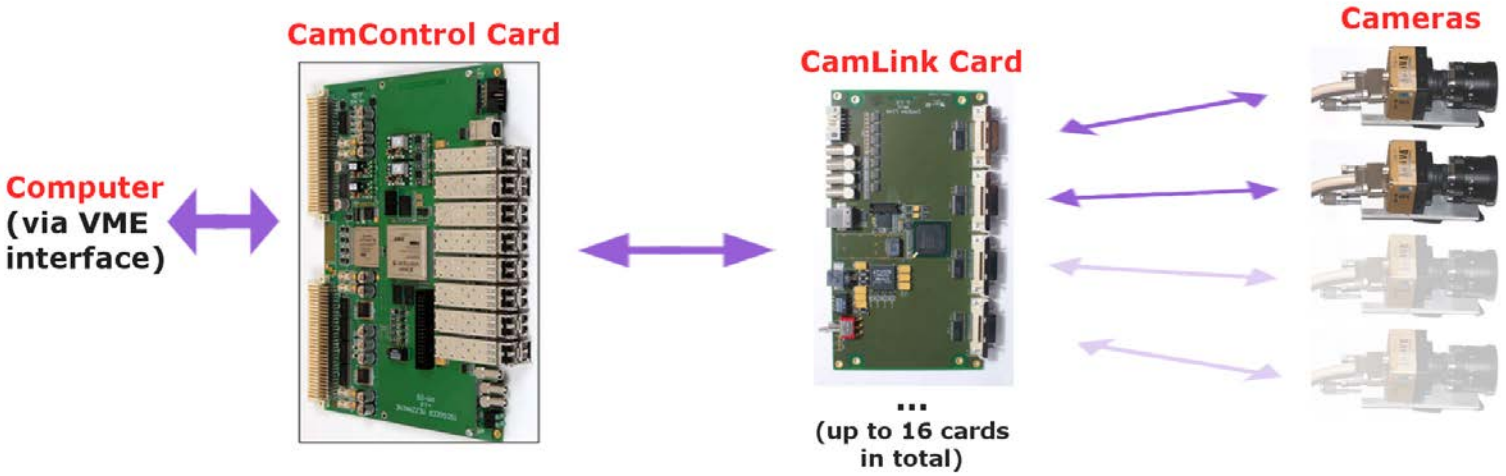
Multi camera readout development

Multi-camera readout system

Project reports by Malte Albrecht, Madhu Thelajala and Geng Xiaoxiu (www.physics.uu.se/np/panda/pub)



CAMCTRL FPGA board
(ATLB originally for WASA trigger)
is used for readout. It has capacity of up to 8 CAMLINK FPGA boards.
FPGA Software:

- Control and readout of camera link board ready
- VME readout ready

CAMLINK FPGA card is used for readout of 2-4 cameras:
1'st prototype board debugged and software developed
2 boards of a modified version were produced and tested
FPGA Software:

- Camera link readout and pellet recognition implemented
- Communication with camera and CAMCTRL board works

Remaining tasks

- Tests of synchronization of boards and cameras in pellet runs.
- Implementation in the PTR data handling and analysis software.
- Extensive complete tests with different multi-camera setups ...
  ... tests with 2 cameras at UPTS has started now in December.

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PANDA pellet tracking system

Project planning status (December 2014)

Design: Conceptual and system design ready (TDR +++).
PhD thesis (Jan15), A.Pyszniak :
"Development and Applications of Tracking of Pellet Streams"
Detailed mechanical design remains.
Detailed camera r/o and control system in progress.

Preparation of a tracking section for PANDA:
Not funded.

Risks: Evaluation done (most recent one in autumn 2013).

Financing, applications: (Approval of TDR may help ...)
Running: SRC application 2015-18 rejected Nov14.
HPH application fall 2015 - 2017 submitted.
Equipment: KAW application was (strongly) rejected.
CTS appl. (30k€) approved Nov14 !
No other possibility in SE at present.

Time line: If HPH application is successful some design and development work can continue. The CTS application has been approved so one (of seven) detection module can be prepared (if we can keep personnel). Preparation of main equipment must still wait.

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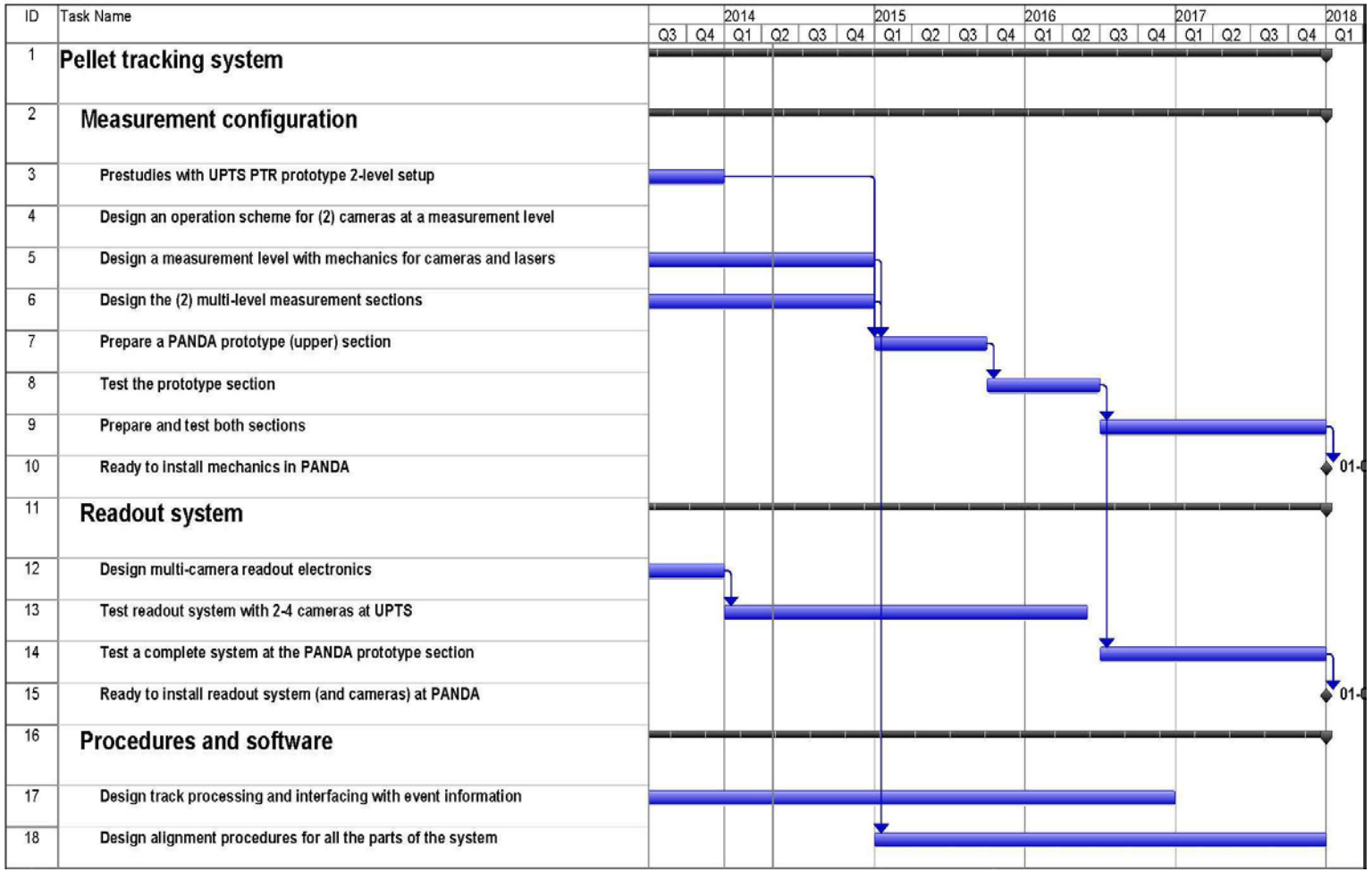
Project plan for the pellet tracking system developments 2014-2017



UPTS at TSL

Need for new funding (pers+eqpt)

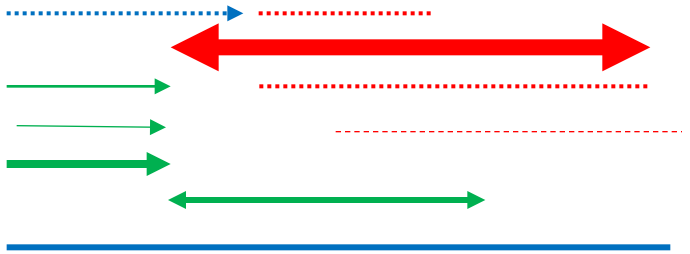
EC HP3+HPH: 30% eng (+cons)

SRC: 20% eng (+cons+eqpt)

PhD student: (JU/UU)

CTS: 10% eng (+eqpt)

UU pers (55% res, 20% eng)



(pers=personnel, eqpt=equipment, cons=consumables, eng=engineer, res=researcher, UPTS=Uppsala Pellet Test Station, TSL=The Svedberg Laboratory, UU=Uppsala Univ., JU=Jagiellonian Univ., EC=European Commission, HP3/H=Hadron Physics 3/Horizon, SRC=Swedish Research Council, CTS=Carl Tryggers Stiftelse)