UFO Processing + Control

Meeting 16.11.2010 14:00-15:30, room IPE-413

Participants:	*Absent:*
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Goal of the Meeting

Information exchange on:

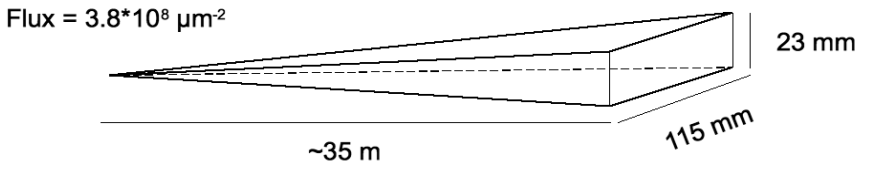
- Who is interested in which tasks?
- Competence in the relevant fields?
- Who has already running activities?

General

Tomsk will will contribute to the UFO project with student work in the fields GPU computing, graphical user interfaces, control applications. The students will be prepared in courses for the specific UFO needs. Afterwards the students will be do an internship of 6 to 12 month on site.

Victor Asadchikov presented preliminary result on the mechanical+optical design. He pointed out that specification of X-Ray Camera, Data Output and Mechanics is crucial for the project.

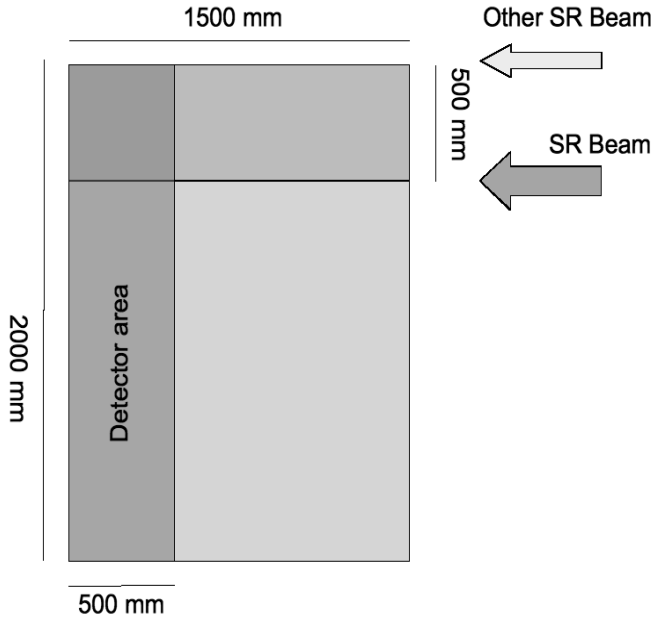
Beam shape



Flux = $3.8*10^8$ μm^{-2} s^{-1}

Rotation speed = 10000 rpm = 166 rps.
One rotation time = 6 ms
Projection number =720
Time per projection = 8 μs
Amount of photons per projection = 3000 μm^{-2}

Optical table



Status of activities

We summarized the status of current activities and interests of the known collaborators in the project. The next step is to refine the project plan for the work packages and to coordinate further developments.

WP 3: "Processing"

- GPU platform Review / Suren Chilingaryan, KIT
- Programming Framework (CUDA, OpenCL, …) / Suren Chilingaryan, KIT + Petersburg

- Image pre-processing / Tomsk + Petersburg
  - Noise reduction / Tomsk

- Reconstruction / Petersburg, Moscow, KIT
  - PyHST / Back projection, Suren Chilingaryan, KIT
  - Laminography / Anton Myagotin, Petersburg
  - Algebraic Reconstruction / Petersburg + Moscow
    - GPU optimization / Alexey Buzmakov, Moscow

- Automation Framework / KIT + , Boris Roshchin, Moscow
  - ANKA: Tango, SPEC
  - Sibir II: Labview, Future: Tango?

- Graphical User Interfaces (GUI) / Tomsk + Petersburg
  - Visualization, Rendered Volumes Explorer / Petersburg
    Tools used: ANKA: AVISO, imageJ / Sibir II: AMIRA
  - Management program for devices / Tango interface / Tomsk
    (Foreseen for ANKA + Sibir II)

WP 4: "Control"

- Streaming Camera Setup / Suren Chilingaryan, KIT

- Feedback control algorithms
  - Fast reject / Uros Stevanovic, KIT
  - Beam Tracking, adjusting the camera / Tomsk

For the control activities, sample applications are necessary to demonstrate the the feasibility and the advantage of closed loop experiments.

Tomy dos Santos Rolo suggested the following experiments. More possible control applications need to be discussed.

- Chemical Bubbles: Example for Fast reject / adaptive frame rate in 2D
- Insect stimulation: Adaptive frame rate