

Questionnaire concerning availability of beams for PANDA: **Beam line/HESR**

The scrutiny group appointed to review the project status and make physics-driven suggestions for a possibly stretched installation schedule towards the full PANDA detector has worked out this questionnaire.

It focuses on the availability of beams for commissioning the PANDA-detector asks for the expected properties of beams on the internal target useful for first experiments.

We request a response time before May 15.

Please understand the following:

- Depending on the progress you have achieved some of the questions may appear obsolete and some of the answers may appear evident. This may not apply to projects different from yours, so please just briefly explain why your answer may be as it is.
- None of the following questions is intended to question your expertise. On the contrary we trust and rely on your qualified response. If any of the wording is not to your liking, take our sincere apologies. The questions are meant and designed to scrutinize the progress of PANDA.
- You may not feel like answering all questions because sometimes several questions may touch upon the same issue as you understand it. In these cases, just indicate briefly where you put the information.
- While some of the questions may be perceived as very demanding by your group, we feel that most information is not different from what you might provide with a TDR, a funding application or the like. If you think that something is not necessary, just say so, perhaps including a short explanation of your views.

Thank you for the cooperation and your valued input to the process needed to consolidate PANDA.

System name: **HESR/Beam line**

System manager and contact: Dieter Prasuhn

1. Status of the HESR project:
 - How close to final is the present design of the HESR?
 - Is the timeline of the HESR installation commensurate with that of the internal detectors and target stations? How are these timelines coordinated?
 - Do you plan writing a technical readiness report?

2. Status of the PANDA magnets:
 - How fruitful do you experience the collaboration with the groups in charge of the PANDA magnets, which will be part of the HESR?
 - Which input did you get from the PANDA collaboration?
 - Which input do you expect from the PANDA collaboration?
 - Has the compensation solenoid be designed and where it will be built?

3. Commissioning of PANDA with HESR beams:
 - In case of delays with SIS 100, will protons be available in Jan. 2019?
 - Energy?
 - Number of stored particles?
 - When will antiprotons be available?
 - Energy
 - Number of stored particles
 - Do you see a different scenario for first HESR-beams?

4. When do we expect to have antiprotons stored in the HESR regularly?

5. Which will be the parameters of antiproton beams?
 - Injection energy
 - Energy range
 - Momentum bite
 - Average number of stored particles

6. Which will be the beam parameters at the IP?
 - Beam emittance
 - Size of focus
 - Divergence at focus
 - Beam halo
 - Lifetime without target: How do you expect the beam lifetime to develop in the first years after day-1?
 - Luminosity: How do you expect the luminosity to develop in the first years after day-1?
 - How do you expect the beam quality (emittance, halo) to develop in the first years after day-1?

7. Information from the HESR for beam on target
 - Is the beam current signal available and with which precision?
 - How well could we deduce the luminosity given the absolute thickness of the cluster-jet in the overlap region?
 - How do you perform steering of the beam onto target and how well will fine-tuning be implemented?

8. Where can we find technical information pertaining to the beam parameters, the accumulation cycles, the duty cycle etc.?

9. Risk assessment:
 - When were possible risks signaled?
 - In your opinion, is the PANDA collaboration sufficiently aware of possible risks?
 - Does the PANDA collaboration cooperate sufficiently to work towards a solution of all issues concerned with possible HESR risks, e.g. beam loss vs. detector radiation damage for particular detectors, etc.?
 - Are there serious risks for any particular detector system?