

Dear Professor Schuch,

Your Letter of Intent 'SPARC Stored Particles in Atomic physics Research' has been positively evaluated by the APPA-PAC (see report attached) and recommended for getting green light to go towards a Technical Proposal. We concur with this evaluation and invite you to present a Technical Proposal at the latest 15th of January 2005, where your collaboration responds to the best of its possibilities to the points raised in the PAC report and to the topics outlined in the attached template. In your document we ask you to follow closely this outline and leave free the points, which are not applicable to your experiment. This will allow an easier evaluation of the proposals, which will be done by the end of March 2005.

For any question related to the evaluation of the proposal and the physics issues during this time period do not hesitate to contact the chairman of your PAC. For technical matter related to the facility and the implementation of your experiment during this time please do not hesitate to contact Hans Gutbrod.

Looking forward to your further collaboration

with best regards

Sidney Gales

Hans H. Gutbrod

Chairman of STI

FAIR project coordinator

APPA-PAC REPORT: LoI #21 SPARC :

This Letter of Intent describes an experimental program which has been one of the corner stones of the Conceptual Design Report (CDR) of the FAIR facility. Its main focus is on the unique and exciting opportunities that will emerge from the availability of stored and cooled highly-charged ions from rest up to relativistic energies for new atomic physics experiments: Fundamental tests of quantum electrodynamics in the presence of strong fields, atomic structure and many body effects, atomic reactions and dynamic in the strong perturbative regime, new applications of atomic physics at the interface with nuclear physics.

As discussed already in the CDR, experiments with HCIs are planned to be performed in the SIS100/300 tunnel, in a high energy cave, at the NESR, and in a low-energy area incorporating also HITRAP. No new requirements on the present layout of FAIR, beam quality etc. are foreseen; the low energy area and HITRAP, however, will now be incorporated into the FLAIR facility (see LoI # 19).

Laser spectroscopy at SIS and Laser cooling (see LoI #18) have similar requirements. While the precise location of the experiments in the SIS tunnel does not seem to be critical, provided a long straight section is available, the PAC sees nevertheless a problem of access and the danger of strong perturbations due to the SIS operation. This must be studied in more detail.

The PAC also discussed the impact of the reinjection of radioactive Li-like ions into the SIS rings. It is expensive and difficult and is presently not foreseen in the FAIR layout. From the point of view of the

planned atomic physics experiments alone the reinjection should not get high priority.

The collaboration involves well known and competent groups out of 65 institutions all over the world and should be strong enough to realize in time the extensive R&D and instrumentation program. The PAC acknowledges that the collaboration has started to define working packages and responsibilities for the various subprojects as well as invest and manpower demands.

Summary: The PAC attributes a high scientific quality to the SPARC LoI. With the exception discussed above it does not see any major technical obstacles which could delay or even prevent the realization of the various subprojects. The definition of working packages and responsibilities should be continued, financial and manpower estimates should be sharpened, and timetables and milestones should be worked out in more detail.

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