Memorandum of Understanding

on the design, construction and building of the

HISPEC/DESPEC setups

at the Low-Energy Area at the Super FRS

Preamble

At the low-energy branch of the Super-FRS beams of radioactive ions with energies from 0-150 MeV/u will be available. These beams can be used to induce reactions and create radioactive species.This memorandum –of-understanding(MOU)concerns the construction of a versatile setup, called HISPEC/DESPEC, to measure, with high resolution and efficiency, particles and gamma rays emitted in both the resulting reactions and radioactive decays. The setup is intended to address questions in nuclear structure, reactions and nuclear astrophysics. The radioactive beams, which can be delivered both from the Low-Energy Beam buncher and the NESR, will be used for gamma, charged particle and neutron spectroscopy. The HISPEC (High-resolution in-flight spectroscopy) setup will comprise *inter alia* beam tracking and identification detectors, the AGATA Ge array, charged particle detectors, plunger, and a magnetic spectrometer. The DESPEC (Decay spectroscopy) setup will comprise *inter alia* Si-based, implantation and decay detectors, a compact high resolution Ge array, neutron detectors, fast BaF2 detectors, a total absorption gamma ray spectrometer and a magnet for isomeric moments measurements. It will also be possible to combine the two setups for recoil decay studies, with the DESPEC detectors being placed at the end of the magnetic spectrometer. The approximate space needed for the HISPEC/DESPEC setup is $20x30m^2$.

In the NuSTAR meeting, held at GSI on December 2-3, 2004, the technical proposal for the HISPEC/DESPEC collaboration was discussed. The Collaboration decided, based on discussions during the meeting, that this MoU should be drawn up to allow the members of the collaboration to indicate their desire to work towards obtaining the funds necessary to finalise the design and building up of the HISPEC/DESPEC setup so that it will be ready to take beam in Phase I of FAIR.

The present MoU is of limited duration. It implies no legal commitment to the construction of HISPEC/DESPEC but by signing this MoU the participating scientists (one representative per participating institute) in the HISPEC/DESPEC collaboration express their intention to bid for the necessary funds from the various funding agencies in their home countries.

Article 1
Purpose

The purpose of this MoU is to provide the basis for international support for the construction and future use of the HISPEC/DESPEC setup as described in the Technical Proposal submitted to the Programme Advisory Committee for NuSTAR science in January 2005.

Article 2
Organisation

The HISPEC/DESPEC Collaboration is part of the NuSTAR Facility organisation. The NuSTAR Council consists of one member from each participating institute. The NuSTAR Board of Representatives has 5 members elected by the Council and two ex-officio members from GSI, one of whom acts as secretary.

- The HISPEC/DESPEC collaboration has a Management Board (with joint spokespersons, deputies and project managers), a Technical Board and a Collaboration Board. The Collaboration Board is composed of the signatories to this MoU. It oversees the physics and policies of the collaboration. The management board manages the project and reports to the Collaboration Board. The Technical Board is composed of the coordinators of the working groups and it is chaired by the project managers. It reports to the management board.

- The Collaboration Board meets during the regular NuSTAR meetings. In addition other regular collaboration meetings may be scheduled.

Article 3
Host Laboratory

The HISPEC/DESPEC experiments are an integral part of the rare-isotope facility (NuSTAR facility) based on low-energy, secondary beams produced by the Super-FRS as described in the Conceptual Design Report for the International Facility for Antiproton and Ion Research (FAIR). The HISPEC/DESPEC collaboration will work directly with the NuSTAR management.

Article 4
Duration

This MoU becomes effective for each party upon signature. It extends to the completion of construction of the HISPEC/DESPEC setup. It will be replaced later by an MoU directly concerning the exploitation.

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G. Sletten (NBI, Copenhagen, Denmark)

J. Simpson (CCLRC Daresbury, Daresbury, UK)

J. Gerl (GSI, Darmstadt, Germany)

R. Lovas (ATOMKI, Debrecen, Hungary)

S. Mandal (Univ. of Delhi, India)

P. Woods (Univ. Edinburgh, Edinburgh, UK)

L. Batist (PNPI, Gatchina, Russia)

P.M. Walker (Univ. Surrey, Guildford, UK)

I. Martel (Univ. Huelva, Huelva, Spain)

M. Leino (JYFL, Jyvaskyla, Finland)

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H. Mach and J. Nyberg (Uppsala Univ., Uppsala, Sweden)

B. Rubio (IFIC, CSIC, Valencia, Spain)

M. Pfuetzner (Univ. Warsaw, Warsaw, Poland)

M. Bentley (Univ. of York, York, UK)

Appendix

HISPEC/DESPEC collaboration structure

Management Board

Spokesperson(HISPEC)	Zsolt Podolyák / Wolfram Korten
Spokesperson(DESPEC)	Berta Rubio
Deputy (HISPEC)	Jan Jolie
Deputy (DESPEC)	Phil Woods
Project manager (HISPEC)	Juergen Gerl
Project manager (DESPEC)	Magda Gorska

Technical Board

	member	**affiliation**
beam tracking and identification detectors	J.M. Quesada	University Sevilla, Spain
AGATA	J. Simpson	CCLRC Daresbury,UK
HYDE charged particle detectors for reaction studies	I. Martel	Huelva University, Spain
Charged particle detectors for structure studies	D. Rudolph	Lund University, Sweden
Plunger	A. Dewald	Koln University, Germany
Magnetic spectrometer	D. Ackermann	GSI Darmstadt, Germany
DSSD implantation and decay detector	P.J. Woods	Edinburgh University, UK
DESPEC high resolution gamma detectors	A. Jungclaus	Universidad Autonoma de Madrid, Spain
Neutron detectors	D. Cano-Ott	CIEMAT Madrid, Spain
Total absorption spectrometer	L. Batist	PNPI Gatchina, Russia
Fast timing with BaF2	H. Mach	Uppsala University, Sweden
Isomeric moments	D. Balabanski	Camerino University, Italy
Electronics and Data acquisition	J. Nyberg	Uppsala University, Sweden

Collaboration Board

The members are the signatories of this Memorandum of Understanding.

Involvement of the participating institutions

The signatories of the HISPEC/DESPEC MoU intend to bid for funds to provide the additional personnel and investment money needed for the design and construction of the experimental setups described in the Technical Proposal. The current list of tasks as well as information on how the work is shared is given in the Technical Proposal. The HISPEC/DESPEC collaboration is open for new collaborators.