



European Gamma-Ray Spectroscopy Pool Owners Committee

MEMORANDUM OF UNDERSTANDING

I PREAMBLE

This document outlines the RISING (Rare ISotope INvestigations at GSI) project incorporating a γ -detector array formed partly from European Gamma-Ray Spectroscopy Pool (EGP) detectors and associated equipment to be hosted by GSI, Darmstadt.

This document also forms an agreement between the RISING collaboration, the host laboratory and the EGP Owners Committee (OC) concerning the resources needed for the project and their maintenance and upkeep over the period of the project. This is following an agreement with the former EUROBALL Coordination Committee on the same resources and formalizes retrospectively the use and treatment of the EGP resources since July 1. 2003.

II PROJECT DESCRIPTION

The RISING project is aiming at nuclear γ -spectroscopy employing exotic beams from the SIS/FRS facility at GSI. Three types of campaigns with fast beams, i.e. energies around 100 MeV/u, beams slowed down to the Coulomb barrier region and stopped beams are considered. Each campaign is intended to last for typically two years with possible changes of the duration depending on the scientific success of the respective programme. The RISING collaboration and GSI as host laboratory are planning and preparing for all these campaigns.

The motivations to explore nuclear structure of exotic nuclei focus on the following subjects:

- Shell structure of instable doubly magic nuclei and their vicinity
- Symmetries along the N=Z line and mixed symmetry states
- Shapes and shape coexistence
- Collective modes and E1 strength distribution
- Nuclear magnetic and electric moments

A detailed description of the physics case and the experimental technique is given in the RISING status report in Appendix A and in the references therein.

The first Fast Beam Campaign was performed from August 2003 until April 2005. After re-arranging the set-up the first Stopped Beam Campaign started with g-factor measurements in October 2005. Since February 2006 another, compact set-up is in operation. The MoU is valid until the 31st December 2006.

Up to now, a total of 163 days, which correspond to 23 weeks, have been allocated by GSI to the RISING experiments. This corresponds to an average of more than 8 weeks per year, which is about 50% of the total amount of SIS/FRS beamtime. For the scheduled beam time in 2006 a similar fraction of beam time is considered.

III PROJECT ORGANISATION

A MoU of 42 collaborating European institutes constitutes the RISING project. The collaboration is represented by a Steering Committee supervising the project. A project manager (PM) is responsible for the technical issues of the project. Working groups lined-up from members of the collaboration develop, build and maintain the experimental set-ups. GSI acts as host laboratory for the RISING experiments, providing infrastructure and work force to prepare and run experiments. Moreover, GSI as Home Base of the Cluster detectors and their associate equipment provides infrastructure and work force to maintain, repair and improve the detectors.

The Host in accord with the RISING collaboration nominated H.J. Wollersheim (GSI) as the technical Project Manager (PM). The PM and the chairperson (CP) of the RISING Steering Committee (currently F. Camera (Milano)) is responsible for the contact between the OC and the Host respectively the RISING collaboration. The PM will take charge of the good use of the resources in the host laboratory. The CP will submit Progress Reports to the OC, and, upon requests, the PM will provide the status of the resources. Upon completion of the project, the CP will provide a final report to the OC.

IV PROGRAM IMPLEMENTATION

Experiments to be run in a Campaign are usually discussed and agreed on by the particular Campaign collaboration being advised by local GSI experts. Proposed experiments are selected by the GSI Experimentausschuss (international Programme Advisory Committee). The Host will continue to schedule the approved experiments in a way to enable fast and efficient running. Whenever possible, priority will be given to RISING experiments.

V RESOURCES PROVIDED

To realize the RISING project, all Cluster detectors with their associated resources for operation are requested from OC. In addition equipment needed to maintain the detectors at GSI are requested.

The technical case describing the system to be operated for the present project and its technical specifications are given in Appendix B. The Campaigns planned for RISING cause only standard risks to the equipment, i.e. cooling failure, power failure, neutron and charged particle irradiation, mechanical shock. Well established precautions against these risks are taken, which are similar in all major host labs. If a non-standard risk arises in any future operation the collaboration and the host will inform OC about it and the planned precautions. The detailed list of resources to be provided by EGP is described in Appendix C.

VI RESPONSIBILITY OF THE COLLABORATION AND THE HOST LABORATORY

The RISING Collaboration and the Host are jointly responsible for the equipment in its entirety during the duration of the project. The duration of the project is defined from the shipment of equipment from the home-base laboratory and ends after the tests and repairs of the returned equipment have been made and have been approved at the home-base laboratory.

If the equipment is not in use, it will be suitably stored. Inventories for the equipment will be kept as well as maintenance records for all equipment during the project. These will be made available, when needed, to the OC. Use of equipment outside the project must be approved by the OC.

The RISING Collaboration and the Host will maintain the equipment in a working state and take all measures to avoid failure. Associated infrastructure is provided by the Host and maintained to avoid harm to the equipment (cryogenic autofill system, uninterrupted power supplies, etc.). The RISING Collaboration and the Host will oversee that the resources are not subjected to high risks (such as intense neutron fluxes, radioactive contamination, chemical risks, and intense electromagnetic fields).

The Host is responsible for the maintenance and up-keep of all of the resources during the whole duration of the project. Running costs and costs of repairs by the home-base laboratory are the sole responsibility of the RISING Collaboration. In addition, the RISING Collaboration will make all reasonable effort to finance the repairs by companies if needed. VXI electronics that cannot be repaired has not to be replaced.

The RISING Collaboration has organised financial arrangements for the running costs of the resources.

VII RESPONSIBILITY OF THE EGP

The EGP will provide the equipment listed (unless otherwise agreed between the OC and the Collaboration) in full working order and free from damage. Documents to show the detailed status of most of the resources provided were supplied prior to shipment by the Euroball Collaboration.

VIII TRANSPORTATION OF THE RESOURCES

Not applicable because the Host is home-base laboratory.

IX NOTES & ANNEX LIST

Appendix A: scientific case for the project

Appendix B: technical case

Appendix C: equipment list

SIGNATORIES

Signatories of this Memorandum of Understanding, including the annexes A, B and C are the OC chairperson, the chairperson of the RISING Collaboration, the RISING Project Manager (PM) and a representative of the Host Laboratory.

OC chair person (S. Lenzi)

RISING chairperson (F. Camera)

RISING PM (H.J. Wollersheim)

GSI representative (J. Gerl)

Appendix A

SCIENTIFIC CASE OF THE PROJECT

RISING Report

Appendix B

TECHNICAL CASE OF THE PROJECT

RISING NIM paper

Appendix C

LIST OF MATERIAL

List of items from Euroball resources originally provided for RISING

Detectors

- 17 Cluster detectors and 1 spare cryostat
- 105 HV elbows
- full records of assembling, test and repair of Cluster detectors
- 1 manipulator (produced at GSI)
- 1 manipulator (produced at Legnaro)
- all equipment needed for mounting and dismounting (except standard tools)

Electronics

- 17 Cluster cards and all spare cards
- 3 VXI crates (since 3.2006 at Ganil)
- 4 STR8080 DT32 (since 3.2006 at Ganil)
- 4 Resource manager (since 3.2006 at Ganil)
- 1 Master trigger unit
- 1 VME crate
- 2 D2VB unit
- 1 HV CAEN crate with 16 cards, each card for 16 channels
- Cluster power supply
- 1 complete UPS unit

Maintenance equipment

- Complete GSI pump unit
- Annealing oven with pump
- All spare parts and equipment for Cluster detectors
- 2 Ortec power supplies for Cluster detectors
- 1 HV Caen crate with 2 cards
- 3 trollies for Cluster detectors