SPECTROMETER DEVELOPMENT PLAN

DESIGN REVIEW

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Initial		**0109/2005**

1. INTRODUCTION

The spectrometer team LAM/CPPM/IPNL is developing technical facilities to prove the performance of a spectrograph for the SNAP mission.
These facilities include the development of a full spectrometer demonstrator, a set of test facilities tools and a simulation.
Some hardware expertise has been developed on the slicer technology for the JWST mission. This technology is at a TRL6 level thanks to ESA development for the NIRSPEC project. A prototype was built for this purpose and has been used mainly for verification of imaging.

The development of the spectrometer project plans to provide a new opto-mechanical concept of the SNAP instrument prepared in interaction with the SNAP project well in phase with the current specifications and constraints.
The current R&D development plan for 2005-2006 includes two more steps:

- A development of procedure and analysis tools. This is managed through campaigns of tests using the existing ESA prototype slicer. This will allow to define procedures for alignment, calibration and data acquisition and to develop in advance analysis and simulation tools.
- A complete design of a spectrometer demonstrator based on SNAP specifications and a new slicer prototype. This demonstrator will be mainly used to test crucial performances on the full wavelength range. Two data taking campaigns will allow to do tests both in the visible and in the IR range.

One objective of this phase is also to develop a good expertise on this technology with an integrate team between the 3 laboratories.

In November, the campaign on the existing slicer will be near completion and a first complete opto-mechanical design of the demonstrator will be ready, including some thermal studies. In parallel a new opto-mechanical concept of the SNAP spectrometer will be ready. In this context, a preliminary design review will help to secure the future project.

2. OBJECTIVES

The points to be reviewed are the following:

- Review the results provided by the existing slicer.

The NIRSPEC/JWST slicer has been used to test alignment and calibration procedures, to define all tool facilities for illumination and data acquisition and to test reconstruction and simulation for the SNAP Mission. A series of tests to evaluate the PSF measurement accuracy will be performed. The setting, procedures, methods and first results will be presented.

Documents:

- *Specifications and procedures document*
- *Set up definition*
- *Analysis results*

- A technical review of the demonstrator concept and design compared to the SNAP specifications. This is the main point of the review. The demonstrator will be used for room temperature tests and cold tests. This implies to be installed into a cryo vacuum chamber. We will use an existing facility to perform the tests.

Documents provided:
- *Specifications and requirement document*
- *Test plan*
- *Calibration procedure*
- *Opto mechanical concept*
- *IR detector interface document*
- *Thermal studies*
- *Expense summary*

3. OTHERS TOPICS:

A discussion of the development plan of the SNAP instrument will be conduct in order to explore possible milestones for the next phases and high level development plan including the possible participation of all agencies (trying to identify different scenarios).

Documents provided:
- *Specifications and requirements document*
- *Project management and management structure*
- *Preliminary Concept development*
- *Work plan*

5. REVIEWERS

- Mike Lampton, Lawrence Berkeley Lab. (SNAP Project member)
- Bruce Woodgate, Goddard – NASA (SNAP Project Member)
- Jean-Pierre Counil, (+ engineer) , CNES
- Philippe Lavocat , IN2P3

To be identified:

- Mechanical engineering expertise

- INSU reviewer

4. DATE AND LOCATION

The review will be located in LAM the 14-15 November (to be confirmed after the November SNAP collaboration meeting date announcement).

5. TENTAVIVE AGENDA

1. Introduction to the project – general specifications

2. The SNAP instrument
    a. Overview
    b. Work plan

3. Existing slicer tests
    a. Specifications and set up
    b. Results

4. Demonstrator
    a. Optical concept and comparison with SNAP
    b. Opto mechanical concept
    c. Test plan

5. Management and scheduling

6. Board deliberation & recommendations

7. Overall SNAP project discussion