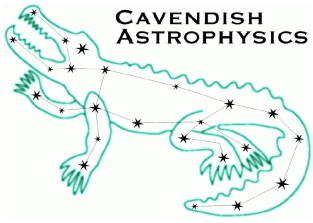
MROI Science Combiner Downselect

Workpackage Definition

INT-407-PMG-*nnnn* rev 0.2

10 July 2006

John Young
jsy1001@cam.ac.uk



Cavendish Laboratory
JJ Thomson Avenue
Cambridge CB3 0HE, UK

http://www.mrao.cam.ac.uk/

Magdalena Ridge Observatory
New Mexico Tech
801 Leroy Place
Socorro, NM 87801,USA
http://www.mro.nmt.edu

Objective

To define the scope, deliverables, and milestones for the science beam combiner downselect work package. To list the participants in the activity and their roles.

Scope

This document briefly summarises the scope of the MROI science beam combiner downselect work package as re-defined in June/July 2006.

1 Introduction and Background

The “science combiner downselect work package” is a continuation of part of the beam combiner studies began by Cambridge and NMT in December 2005. The background to and scope of the previous beam combiner studies are outlined in INT-407-VEN-0002.

The downselect activity will henceforth be managed as a pseudo (unpaid) contract with the Cavendish Laboratory, with some work being “sub-contracted” to NMT. JSY will act as the point-of-contact for communications with the MROI project manager and IDT related to this work package.

There will be regular “Work Package” meetings (generally by teleconference), along the lines of the other Work Package Meetings being set up at NMT. The format of a work package meeting will generally conform to the scheme proposed by EB in document INT-401-COR-SM-2006-06-15.

The only significant changes from the scope of the previous beam combiner studies are that:

- Options for the fringe tracking beam combiner will not be investigated as part of this work package.
- Studies of possible concepts for a commissioning instrument are no longer part of this work package.

The PNN (Pupil plane Nearest-Neighbour) scheme has been adopted as the baseline combiner concept for the Fringe Tracker, which is now managed as an independent work package.

2 Scope of Work Package

The purpose of the activity is thus to select one of the near-IR science combiner concepts P4S, P8, I4S, I6 to be carried forward. The concepts are described in Baron et al., Proc. SPIE 6268, Paper 64.

Due to the level of detail needed to make an informed choice, a side-effect is that a preliminary design for the downselected combiner will also be a work package product. The work package ends once the downselect has been made.

The end date for the activity is expected to be in early November 2006.

Milestones for the work package are listed in Sec. 4.

2.1 Deliverables

The following deliverables will be provided to NMT as products of the work package:

Deliverable	*Date*
Final Report comparing preliminary designs for each concept, with recommended choice	6 November 2006
Preliminary design drawings and specifications for NMT's chosen concept. Includes switchyard	27 November 2006

A number of the deliverables from the previous beam combiner studies have already been produced – these are listed in Sec. 4.

3 Roles and responsibilities

The participants in the work package and their expected roles are given in the following table (in alphabetical order):

Person	*Institution*	*Role(s)*
Fabien Baron	Cambridge	Image plane combiner/spectrograph design
David Buscher	Cambridge	Modulator specification, error budgets, diffraction calculations
Julien Coyne	Cambridge	Pupil-plane combiner design, switchyard design, modulator tests
Michelle Creech-Eakman	NMT	Spatial filter studies
Colby Jurgenson	NMT	Pupil plane spectrograph design, interface to alignment system
Chethan Parameswariah	NMT	Slide tests
John Young	Cambridge	Point of Contact, Final Report, signal-to-noise and imaging speed calculations, detector requirements

4 Milestones

Milestones with associated deliverables are shown in bold type. Please note that there are no formal deliverables to NMT associated with the other milestones. Internal (to the work package) reports will be produced (and read by the NMT staff on the work package team), but these will not contain sufficient background to be suitable for review by the IDT.

Milestone	*Person(s)*	*Status*
Beam size memos	DFB	Delivered
Generic Switchyard Requirements	JC	Delivered
Devise slide tests	CJ	Complete
Survey of commercial slides	CP	Complete
Generic Detector Requirements	JSY	Delivered
P4S combiner optimization	JC	Complete
P4S switchyard optimization	JC	Complete
P8 combiner optimization	JC	Complete

Milestone	***Person(s)***	***Status***
P8 (internal) switchyard optimization	JC	Complete
P4/P8 manufacturer dialogue	JC	*Due 2006/07/31*
P4S/P8 spectrograph optimization	CJ	*Due 2006/09/01*
I4S combiner optimization	FB	*Due 2006/07/17*
I4S switchyard optimization	JC	Complete
I6 combiner optimization	FB	*Due 2006/07/17*
Optical interface with fringe tracker	JC/CJ	*Due 2006/08/14*
Slide tests Phase 1 (1 slide, tip-tilt repeatability)	CP	*Due 2006/08/14*
Spatial filter evaluation	MCE	*Due 2006/09/11*
Alignability evaluation	JC/CJ	*Due 2006/10/23*
Modulator requirements	DFB	*Due 2006/07/31*
Modulator tip-tilt tests	JC	*Due 2006/09/25*
Signal-to-noise calculation	JSY	*Due 2006/10/09*
Slide tests Phase 2 (2 slides, OPD repeatability)	CP	*Due 2006/10/16*
Imaging speed calculation	JSY	*Due 2006/10/23*
Costing	JSY	*Due 2006/10/23*
Final Report	JSY	*Due 2006/11/06*
Preliminary design for downselected concept	FB/JC	*Due 2006/11/27*