

Total length ~50 pages text and figures.

Intended audience: Top astrophysicists and physicists who are not necessarily cosmologists and who may be somewhat remote from cosmology and the questions of inflation physics.

A. Executive Summary

This is an outline of the importance of the science, why we will be ready to fly and experiment in this decade, and the plan.

B. Introduction

This outlines the sections and layout of the report

C. Science motivation

1. Inflation science

- a. Inflation physics
- b. Quantum fluctuations
- c. Scalar and tensor perturbations
- d. Connection to structure formation

2. Galactic Science

D. Measurements

1. Inflation observables

- a. B-mode polarization
- b. Fluctuation Spectrum
- c. Non-gaussianity
- d. Other probes

2. Space mission

- a. Observation goals
- b. Three designs (LC, intermediate, Comprehensive)
- c. Sensitivity and systematics
- d. Design schedule

E. Plan for the Decade

1. Current CMBpol Experiments

- a. Experimental History
- b. Experiments
- c. Technology
- d. Limitations (sensitivity, foregrounds, systematics)

2. Moving to CMBPol

- a. Maturing Technology
- b. Analysis and data volume
- c. Experiment maturity
- d. Detector and technology development
- e. New Experiments
- f. Mission design and development