

---

## Full Optical Design of the Linear Dispersion Compound Prism Spectrometer

### ABSTRACT

Prism spectrometers are based on the color dispersive characteristics of prisms. Their main advantage over grating based spectrometers is the lack of high-order phenomena which lead to ghosts and cross-talk in addition to SNR degradation. But the main drawback of prisms was always the non-linear dispersion of wavelength versus angle.

The compound prism spectrometer overcomes this limitation, and comprises a useful apparatus for spectrometry and hyperspectral imaging.

In a previous paper the Linear Dispersion Compound Prism Spectrometer was analyzed, emphasizing the color separation module.

In this paper, a full optical design is presented, taking into account all optical parts, including fore optics, focusing optics, slit and detector. Optical performance as well as mechanical layout is calculated and compared to other spectrometer designs.

**Keywords:** Linear Spectral Dispersion, Spectrometer, Optical design,  
Compound Prism, Optical Tolerances

### **1. Introduction**

Research results are presented on the following pages.

Introduction, analyses, conclusions, and references - will be completed soon.

**Full optical design pictures**  
(Including compound prism + collimating and focusing optics)

