

PROMINENCE OBSERVATION AT 11 AUGUST 1999 ECLIPSE WITH THE DANJON ASTROLABE – PRELIMINARY RESULTS

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Abstract. A prominence was observed during the total solar eclipse from 11 August 1999, at Bucharest Observatory, using an astrometrical instrument – the Danjon astrolabe, a CCD camera and an interferential filter near H α . The estimated resolution of the instrument is 0.475 arcsec/px. The fine structure of the prominence could be seen in our images. We present a preliminary report of the eclipse experiment.

Key words: eclipse – prominence – corona

1. INTRODUCTION

The total solar eclipse from 11 August 1999 had its maximum phase at Bucharest, at 11^h06^m58^s UT. The third contact was at 11^h08^m10^s UT, when the zenithal distance was $z = 39^{\circ}45'$. Our purpose was to observe a solar prominence at this eclipse using the Danjon astrolabe (an astrometrical instrument transferred at Bucharest Observatory from the Royal Observatory of Belgium, with the collaboration of Observatoire de Paris, in 1993). The astrolabe is most used for stellar position measurements or for the determination of the solar diameter. As far as we know, it is for the first time that such an instrument was used for a solar prominence observation. The scientific objectives we have followed were: the prominence fine structure, its internal dynamics and, eventually, if possible, the detection of prominence oscillations in brightness. We present here a preliminary report of our results: the fine structure of the prominence.

2. TECHNICAL CHARACTERISTICS OF THE EQUIPMENT

The technical equipment we have used was composed of:
- the astrolabe with an aperture of 100 mm and a focal length of 3500 mm;

- the CCD Camera: Cohu 4710, 512 x 512 px, having an acquisition speed of 500 ms;
- an interference filter Grubb Parsons with the following characteristics: narrow band type 2 Red; peak wavelength 6578 Å; peak transmission 44 %; bandwidth 16 Å; side bands 20.1 %.

The entire complex has a resolution of 0.475 arcsec/px.

3. PRELIMINARY REPORT

At totality, the sky was covered by clouds in most sites in Bucharest, including at the Observatory. We had the chance to have a window. Our observations started at the instant UT 11^h12^m43.178^s, four minutes after the third contact, and lasted till 11^h13^m27.865^s.

The prominence was located on the Western border of the Sun (upper corner left in Fig. 1). The astrolabe is a fixed instrument, so during our observations the Sun and prominences moved in the frame. The solar object observed by our team had two parts: the first and main part of the prominence body could be seen well until UT 11^h12^m49.15^s (Fig. 2) and partially till UT 11^h13^m18.228^s, when the second feature, as an appendix, appears in the frame of view of the instrument (Fig. 3). The last image of the sequence was at UT 11^h13^m27.865^s (Fig. 4).

The analysis of the set of almost 100 images will be in our objective for next works.

The movie of the most important images of our observation could be watched on web, at <http://roastro.astro.ro/~crisd/danjon.html>.

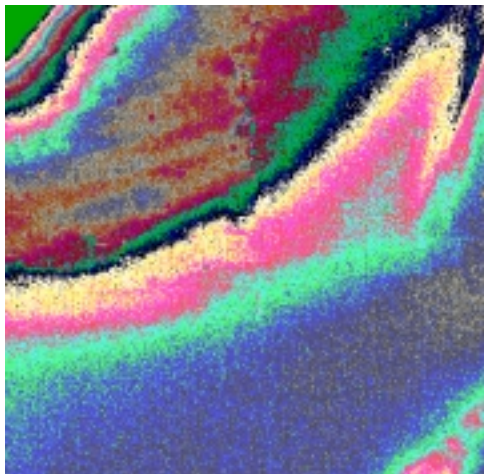


Fig. 1

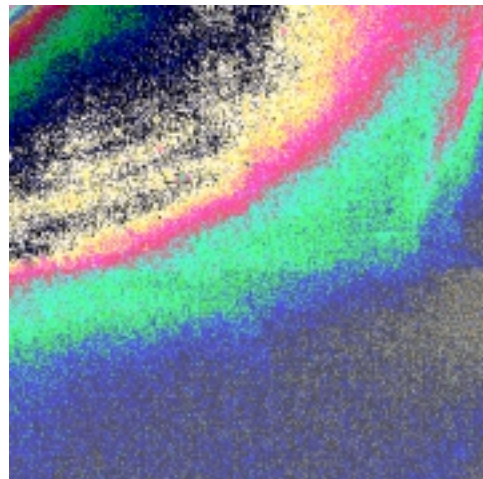


Fig. 2

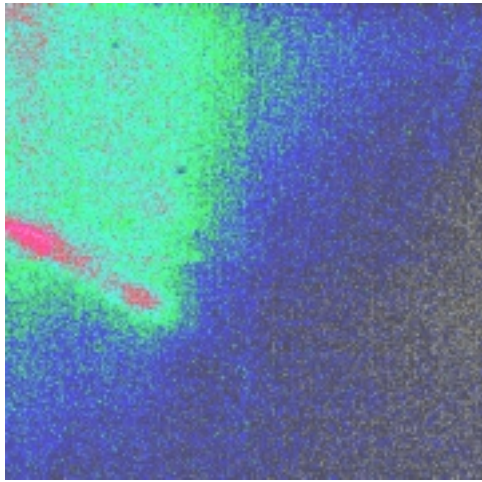


Fig. 3

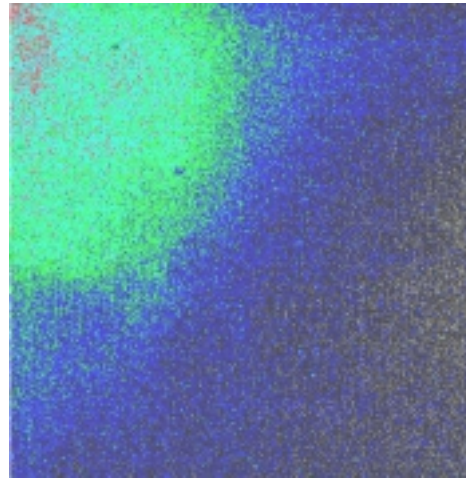


Fig. 4