OBSERVATOIRE DU PIC-DU-MIDI ET DE TOULOUSE

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OBSERVATIONAL PERSPECTIVES ON RED GIANTS

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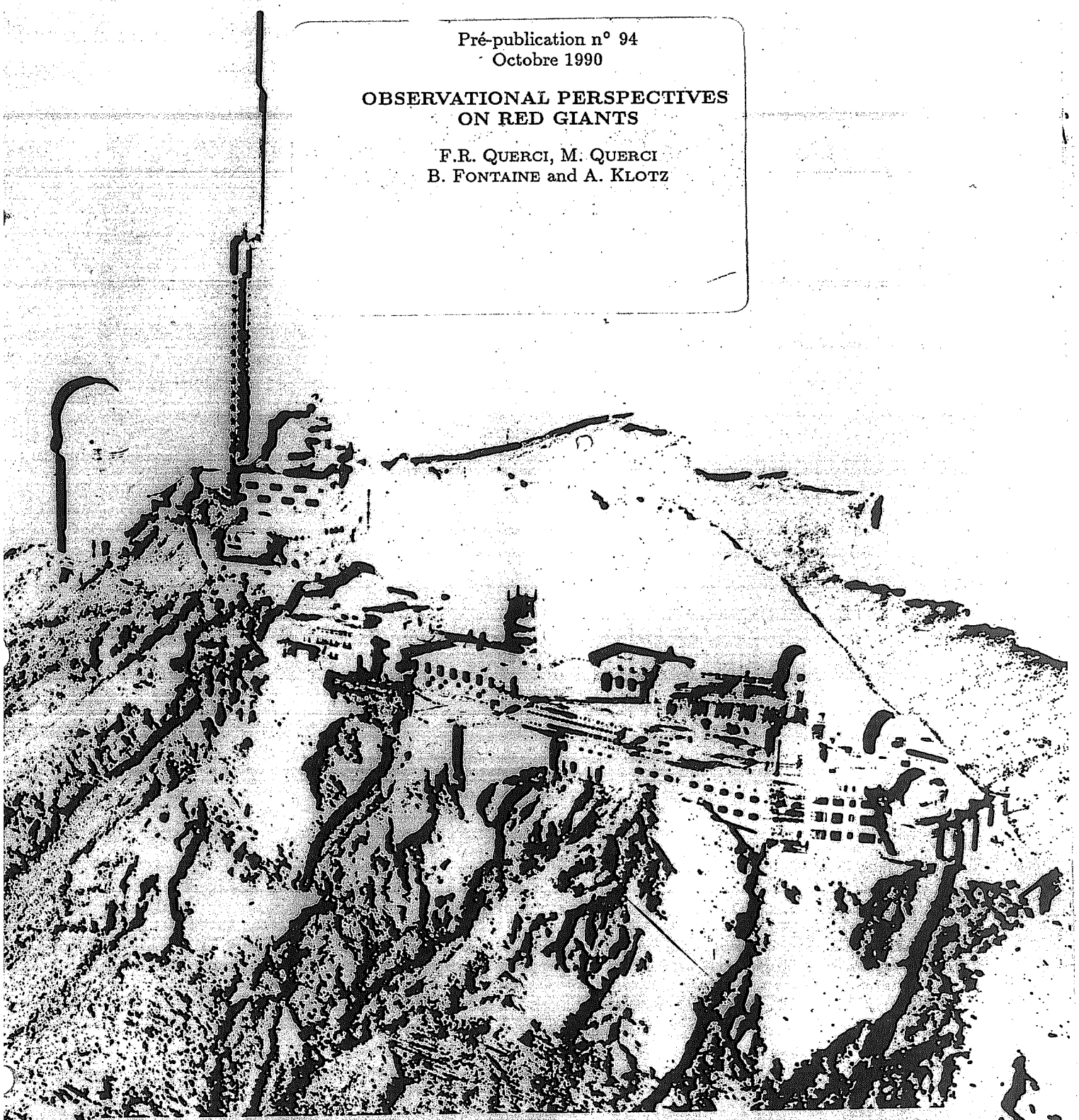

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strong Fe II emissions varying from year-to-year by up to a factor about 10 (which might be explained by the Cuntz (1987)'s model quoted above), and the Al II U1 lines varying on a time scale of the hour and from one day to another one.

A systematic monitoring of a sample of SRb type stars and also RCB stars is developped with a photometric twin-telescope technique (Querci et al., 1989). Two SRb M giants, BU Gem and TU CVn, have shown a period of 1.5 hour with a B amplitude of 0.015 mag. However, a contamination of the observations by telluric opacity variations should be possible. This point seems us so important that we devote the 3.2 paragraph to it.

61 HER

L. Rivas (1989), a GEOS Amateur from Valencia in Spain, has monitored 61 Her (M4 III; SRb) during 4 years. During some nights, he discovers visual variations until 0.5 magnitude. This seemed so strange to many GEOS Amateurs and Professionals that they said him: "Hello Luis, you joke!". To conclude on these variations (which are not permanent), photometric observations were done with the 11-inch twin-telescope at Observatoire de Haute-Provence by the Quercis and with the 70-cm telescope at Jungfraujoch by other members of the GEOS group. Also spectrographic observations were done at the 60-cm amateur telescope (24" reflector) of the Pic-du-Midi Observatory by one of us (A.K.). Fig. 8 shows outstanding results in the July 1989 and February 1990 spectroscopic observations: strong variations of the metallic absorption lines around Hα with a time scale of 1 to 2 hours and a weak change in the Hα intensity itself. Some months after, i.e. on July and August 1990, no variations in the atomic and Hα lines are seen, whereas very small variations appear in the core of the Ca II IR lines.

C. Friedlingstein and J. Vanderbroere (1990), two other GEOS amateurs from Brussels, report variations in the star NSV 3739 CMi (M3 III; SRb) up to 0.3 visual magnitude during some nights in January and April 1990. Photometric and spectroscopic observations are planned to confirm these visual ones.

Theorists have a huge imagination and are able to explain all observations, the good and the bad ones. They invoke: - local changes in amount of material varying column density and temperatures, - changes in the average amplitude of turbulent motions of rising convective cells, - sporadic ejection of matter through magnetic-field tubes, etc. Consequently, to help in discriminating between the various interpretations, observers have to do adapted, irrefutable, and repeated observations on many stars.

3.2-Unambiguous detection of the short-term variations and the probable telluric opacity fluctuations

As all photometrist know, some "good" photometric nights are used to test the instrumentation and to deduce the transformation coefficients.

Let us emphasize some striking observations done at the Haute-Provence Observatory with a twin telescope (two 11-inch Celestron) already quoted above.

- On January 2, 1989, the sky was perfectly photometric, and we monitored the binary star HU Tau. The light curve was conform to the curve of an eclipsing binary, without problem.
- On December 30, 1989, again the sky was perfect and one of us (B.F.) monitored some Pleiades (standard stars). To our great surprise, an oscillation appeared in the three filters V, B and U superimposed to the Bouguer line (Fig. 9). As no technical reason could explain such a periodicity, there is a strong presumption that the oscillation is due to a variation in the atmospheric extinction (Harvey, 1988; Gheonjian et al., 1990). Fig. 10 shows this oscillation on Pleiade C and on Pleiade