

# 1. Introduction

The line H-Alpha is undoubtedly the line which was studied the most in solar physics. This line is obviously sensitive to the chromosphere's temperature variations, but also to the velocities (Doppler effects) and to the magnetic fields (Zeeman effect). It is largely accessible to CCD cameras as well as the conventional optics. But, especially, it gives access to all high chromosphere crossed by the magnetic field responsible for solar activity "dynamics", because it is precisely formed in these layers. The filtergrams obtained in this line show structures (dark: filaments; fibrils; spot's penumbra, etc; and bright: plages; flares; bright points; prominences, etc.) which are excellent magnetic field's tracers and proxies at the coronal base. The photospheric magnetic field, which is studied only for convenience reasons, represents obviously one of the components of this activity, the one which is related to the photospheric radiance from a non-radiative origin. More seriously, this field is formed in the dense layers of the photosphere, on a thickness (approximately 100 km) very limited compared to the thickness of the layers located above the top of the photosphere. The spatial resolution of current measurements over the thickness (of at least 2000 km) of the solar atmosphere under the corona is thus very weak compared to the spatial resolution reached today in the horizontal plane, in altitudes where the photospheric lines are formed (approximately 200 km over the solar surface). The emerging field of the chromosphere is thus impossible to be computed correctly by extrapolating the photospheric field, no matter the sophistication of the program used for that, whereas it determines actually all the corona phenomena. Moreover, the emerging "dynamical" process is badly known and extraordinarily complex because of the small scales phenomena (effective thicknesses scale: approximately 100 km) they are closely bound and play various roles. It is enough to quote the spicule's role, whose dynamic structure is still mysterious and the origin unknown and yet related to the magnetic super-granulation network (wide field horizontal constant velocities). The plage's magnetic field, closely related to the very fine "filigrees" type structures, and to the sunspots which emerges towards a very complex penumbra with multiple components, are not less easy to study. The corona counterparts are only very often arbitrary conjectures. In detail, effective ignorance of these chromospheric layers which however contain a determining part of the magnetism which is at the origin of the heating of the corona and especially, of all the structure responsible for the eruptions and of the "flares"; is absolutely amazing. Since one knows that it is impossible to measure directly the amplitude of the coronal magnetic field (too weak emission lines and moreover, much too widened by the effects of turbulence and also, of Doppler displacements of the structures), it is sad to note how much the study of the chromospheric layers was forsaken. In the optical field of visible, it is however extremely easy to reach the study of these layers. The reason of this disinterest is due at groundbased, to the conservatism and to the inertia of Agencies. With regard to the space one, there is obviously the little of interest shown for practicable techniques on the ground, in particular in the field of the visible one. Nevertheless a large telescope HO already flew during the time of ATM/SkyLab, with photographic techniques which are today completely obsolete. In the field of visible very affected on the ground by the "seeing" effects, splendid results were recorded in space with, e.g., experiment MDI of SOHO, or, even more obviously, with the HST. It should be noted that the promises of the space XUV and Radioastronomy proved without bases with regard to direct measurements of the magnetic field, compared with the potential of visible and with regard to the study of the chromosphere.