PHOTOSPHERIC FIELD GRADIENT IN THE NEIGHBOURHOOD OF QUIESCENT PROMINENCES *

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ABSTRACT

We have determined statistically the horizontal gradiant of the vertical magnetic field in the neighbourhood of filaments inside and outside the active regions during a few months in 1981 and in 1984. The results show that there are meaningful upper and lower limits on the gradiant of the surrounding large scale photospheric magnetic field for the existance of a filament. These limits represent a necessary but not sufficient condition.

TABLE I. Mean values and root mean square deviations of dB_r/ds across the filaments

OUTSIDE ACTIVE REGIONS:

1981 : 4.77 ± 1.80 (10^{-5} G/km) (sample size : 96)

1984 : 2.02 ± 0.84 (10^{-5} G/km) (sample size : 293)

IN ACTIVE REGIONS:

1981 : 11.89 ± 4.30 (10^{-5} G/km) (sample size : 59)

TABLE II

Mean values and root mean square deviations of dB_r/ds across neutral lines without filaments were found to be as given below

OUTSIDE ACTIVE REGIONS:

1981 : 4.93 ± 2.52 (10^{-5} G/km) (sample size : 68)

1984 : 1.92 ± 1.13 (10^{-5} G/km) (sample size : 282)

IN ACTIVE REGIONS:

1981 : 13.98 ± 7.10 (10^{-5} G/km) (sample size : 111)

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