

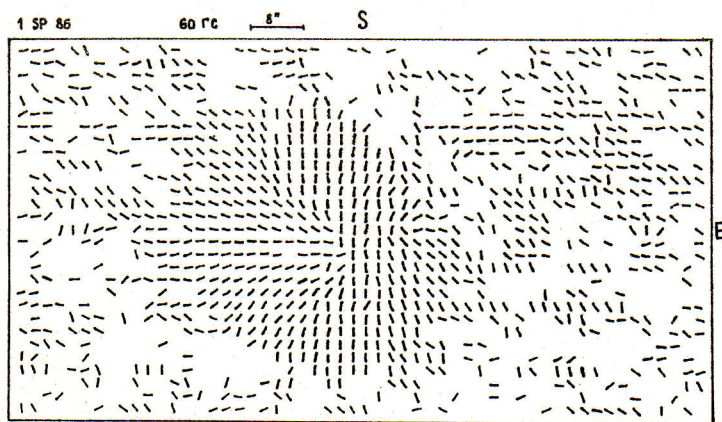
КОЛЬЦЕВЫЕ СТРУКТУРЫ ПОПЕРЕЧНОГО МАГНИТНОГО ПОЛЯ
В ФОТОСФЕРЕ СОЛНЦА
RING STRUCTURES OF THE TRANSVERSE MAGNETIC FIELD
IN THE SOLAR PHOTOSPHERE

Резюме. По наблюдениям с вектор-магнитографа Саянской обсерватории обнаружены новые фотосферные образования - ячейки с усиленным по периферии поперечным полем. Описываются свойства этих кольцевых структур.

In the solar photosphere outside sunspots, two stable kinds of features are observed, namely the granulation with a typical size of 1-2" and the supergranulation (40"). This paper gives a description of observations of the ring structure of the transverse magnetic field with intermediate size.

The observations were made in the years 1984 and 1986 using the vector-magnetograph of the Sayan observatory in line FeI 525.0 nm, with a 2x2" entrance slit (V.M.Grigoryev et al., Bull. AbAO, 1985, v.60, p.159-175). The image portion chosen was scanned at a rate of 2"/sec. The time required to take one magnetogram of the size 120"x80" was 40 minutes.

The so obtained maps for the magnetic field vector transverse component distribution show an interesting feature, namely that the 60-70 G level outlines ring structures, i.e., cells of an irregular shape, with the size 3-18" (7" in diameter, on average).



The figure shows an example of a map for the azimuth distribution (dashes) of the transverse magnetic field near a unipolar sunspot for the observation of 1 September 1986; at points where the transverse field is smaller than 60 G, no azimuths are drawn. The transverse field signal noise in this case did not exceed 50 G. When the level of 80 G and higher is drawn, the ring structures disappear. The ratio of the cell diameter in latitude to the diameter normal to this direction is 1.2, on average, and decreases with angular distance from the center of the solar disk. This is, probably, associated with limb fore-shortening of the cells. Far from active regions, the cells are more uniform in their shapes and sizes. It has not been possible to estimate their lifetime; we wish only to note that on magnetograms obtained at intervals of 2-3 hr, some groups of cells are identifiable. Sizes closest to the observed features have rosettes (14"). Observational data, however, do not permit us to confidently identify cells with rosettes and only a few cells seem to coincide with fragments of rosettes.

Сибирский ЦО АН СССР

Поступила 21 декабря 1988 г.

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