On the basis of the synoptic maps of the photospheric magnetic field obtained by the National Solar Observatory Kitt Peak for 1978-2016, a latitude-time diagram of the magnetic field was built. When averaging intensity values over the heliolongitude, the magnetic field sign was taken into account. In order to consider the characteristics of the distribution of weak magnetic fields an upper limit of 5 G was set.

The latitude-time diagram clearly shows inclined bands corresponding to positive and negative polarity magnetic flows drifting towards the poles of the Sun. Two groups of flows are observed: 1. Relatively narrow bands, with alternating polarity, beginning near the equator and reaching almost the poles of the Sun. Along the time axis, the flow length of one polarity is on the order of 1-2 years; 2. short powerful flows, 3-4.5 years wide, propagating from the spot zone to the poles. These flows reach the poles simultaneously with the begin of the polar field reversal, apparently representing the so-called “Rush to the Poles” phenomenon.

The pattern of magnetic field transport is significantly different for the northern and southern hemispheres. Alternating flows of positive and negative polarities most clearly appear in the southern hemisphere during periods of positive polarity of the southern polar field. For the northern hemisphere the picture is much less clear but for individual time intervals alternating flows of opposite polarities can be traced. The slopes of magnetic flux bands allow us to estimate the rate of meridional drift of magnetic fields, which was slightly different for the two hemispheres: $V = (16\pm2)$ m/s for the southern hemisphere and $V = (21\pm4)$ m/s for the northern hemisphere. The results obtained indicate that the distribution of weak magnetic fields over the surface of the Sun has a complex structure that is different for the two hemispheres and varies from cycle to cycle.