Dynamics of the field-aligned currents in during substorms

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By using satellite magnetic field measurements it is shown that before the substorm expansion phase onset the region 2-like field-aligned currents are not always observed on the geosynchronous orbits at the midnight sector. The relationship between the appearance of these field-aligned currents before the beginning of the substorm expansion phase and the active phase duration and the preceding magnetic disturbance level is found. It is obtained that for the expansion phase having the duration less than 11 min the appearance probability of the region 2-like field-aligned currents before the substorm expansion phase onset T_0 is decreased. As the geomagnetic activity rises before a substorm, the probability of the appearance of field-aligned currents before T_0 is increased. These results indicate that substorm, for which the region 2-like field-aligned currents are absent before T_0, can probably develop in the distant part of the magnetotail.