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## UNUSUAL ROTATION OF A SUNSPOT 30 SEPTEMBER TO 8 OCTOBER 1969

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**Abstract.** The rotation of a leader sunspot in plage region No. 10344, first  $130^\circ$  counterclockwise, then  $142^\circ$  clockwise in only eight days, was investigated. Proper motion of translation of the components of this spot was found more important for flare activity than was rotational motion.

### 1. Introduction

Severny (1969) has carried out a considerable investigation of changes in the magnetic field just before and after a solar flare. These changes are connected with the proper motion of sunspots. McIntosh (1969) mentions the rotation of spots as a pre-flare indicator. A chance to evaluate the comparative effectiveness of rotation against proper motion of translation of sunspots occurred in early October, 1969.

### 2. Observations

A white light picture taken 29 September, 2356 UT, 1969, at the Baguio station of the Manila Observatory, showed a double umbra in the elongated lead spot of a D-19 group. This spot, then at S13 E48, in McMath-Hulbert plage area 10344, was remarkable for the rate at which its axis rotated, particularly after it was joined two days later by a spot with large day-old penumbral development. First the spot rotated counterclockwise. Clock- or counterclockwise relates to an image with north at the top and west to the right and will be abbreviated to CW and CCW.

The axis of the spot on the 2356 UT picture of 29 September 1969 made an angle  $12^\circ$  CCW with the meridian line. There is an ambiguity of  $180^\circ$ , but the subsequent measurements were consistent with the choice of direction on the first picture. A photoheliogram of the Manila Observatory at 0126 UT 2 October showed the spot axis  $74^\circ$  CCW from the meridian. The group had grown to an E-35. By 0915 UT of 2 October, observations of the Osservatorio Astronomico di Roma (Cimino, 1969) show the axis a further  $10^\circ$  CCW. Within the next four hours, i.e. by 1400 UT this lead spot was joined by a spot with day-old penumbral development just to its east, as shown by the ESSA sunspot drawings from Boulder (*Solar-Geophysical Data*, 1969).

From that time, sunspot pictures as well as flare patrol film of the Manila Observatory, show that the amalgamated spot straightened, and continued CCW until the end of 3 October. Then, as through unwinding, it rotated CW for the next 4 days. These rotations are confirmed by the drawings and magnetic observations of the