

(C) The latitudes to be observed in the special region are -0° , 15° , 30° , 45° , 60° , 75° and if possible 80° and 85° . The latitudes to be observed in the general region are -0° , 30° and 60° .

(D) 15 or 20 lines are to be measured in the special regions, these to be selected to include as many elements as possible especially those of high or low atomic weight; about 10 lines, selected by the Secretary of the Committee after consultation, are to be measured in the general region.

3. The principal objects of a study of the sun's rotation by the spectroscopic method are:—

(a) The accurate determination of the velocity of rotation at various latitudes and the derivation of a formula representing the variation of velocity with latitude.

(b) A definite conclusion in regard to the existence of variations in the rate of rotation.

(c) The investigation of the rate of rotation, as shown by the lines of different elements and of the arc and enhanced lines of the same element, to determine whether either the absolute rate of rotation or the law of variation with latitude differs for different elements.

(d) The detection of possible systematic proper motions or drifts in the sun's reversing layer.

4. In accordance with the above plan three series of plates were made during 1911, two in the special region at $\lambda 5600$ and one in the general region at $\lambda 4250$. With a solar diameter of, on the average, 227 mm., the distance of the observed points from the limb in the first series, at $\lambda 5600$, varied from 3.0–4.5 mm.; in the second series, also at $\lambda 5600$, was nearly 10 mm.; and in the third series at $\lambda 4250$ was about 6.5 mm. The distance was varied in order to see if any difference in the rotational value was obtained, and also to see if much change in the definition occurred as the distance from the limb was increased. As will be seen later, the difference, if any, is slight both in the velocity and the definition. Owing to the considerably larger corrections required to reduce the measured to the actual values of the rotation as the distance from the limb increases, it is not deemed desirable to, in future, make the spectra from points at a greater distance than 5 mm. from the limb.

PRECAUTIONS.

5. In all these plates particular care was taken to guard against every known cause of instrumental and other error tending to introduce spurious displacements of the lines, and the experience of one of the writers in stellar radial velocity determinations was of great value in this similar work. Temperature changes and flexure, the chief

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