G E O L O G Y

ABSTRACT

Measurement of Horizontal Ground Surface Deformation in Iceland

by

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Fifty-five survey lines averaging 2.7 km in length were established and measured with a Geodimeter in southern Iceland during the summer of 1967. The lines are joined to form two segmented profiles across the rift zones, and are primarily designed to detect horizontal movements perpendicular to the rift axes. Some stations were also established to measure possible strike slip movement along the open fractures (gjá). Experimental accuracies from repeated observations and calibration checks are within the stated instrumental standard deviation of $\pm$ (10 mm $\pm$ 2 X 10^{-6} X distance). If extensional movements of 20 mm per year take place entirely within a 2 to 3 km line segment, they should be detectable at better than a 99% confidence level in two years. More homogeneous strains across the entire 50 to 100 km wide rift zones will require a much longer wait for their detection. In either case the large number of line segments will allow statistical evaluation of the measurement errors versus possible deformation.