

## Title (en)

METHOD AND APPARATUS FOR MEASURING IN SITU EARTHEN STRESSES AND PROPERTIES USING A BOREHOLE PROBE

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## Application

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## Abstract (en)

[origin: EP0146324A2] A borehole probe (36) includes a soft outer plastic cylinder (42) secured to a central mandrel (39) and inflatable by hydraulic pressure conducted therethrough to impinge upon the sidewall of a borehole (22) with controlled pressure. A plurality of LVDT diameter sensors (67) are secured to the probe (36) in planes perpendicular to the axis thereof and spaced angularly thereabout. A plurality of acoustic transducers (73) is also secured to the exterior of the probe to monitor acoustic emissions as well as to survey the earthen media with ultrasonic emissions. The cylinder inflation pressure is increased gradually to exceed both the tensile strength of the media and also the principal stress therein to initiate fracture of the media surrounding the borehole. The cylinder (42) is then deflated to unload the fractured media, and gradually reinflated to first elastically deform the fractured media and then re-expand the fractures previously created. The diameter data together with the hydraulic pressure and the acoustic emissions data and ultrasonic data are analysed to determine the major and minor stress fields in the media, and also the tensile strength, yield strength, and deformation characteristics of the borehole media. The construction of the probe and the diameter measuring means may be varied when higher pressures are to be used and greater changes in diameter are expected.

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