fault plane, which are intercorrelated with one another by the relationships derived from the stress boundary condition and the consideration of rupture growth.

A TECHNIQUE FOR DETERMINING THE PROPERTIES OF SEISMIC NOISE IN GEOTHERMAL AREAS

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Two experiments were conducted at the Geysers geothermal area (80 miles north of San Francisco) in California to study the nature of seismic noise. In the first experiment, during April 1971, a small L-shaped array of five seismometers spaced 0.5 km apart was operated in one place for three nights. In the second experiment, during September 1971, a triangular array with 1 km seismometer spacing was operated for about a week in one location while another array was operated in four different locations. An evaluation of the data shows the following: (1) The level and shape of the seismic noise spectrum varies by an order of magnitude within an area of 6 km square covered by the experiment. (2) The predominant energy is in the frequency band of 3-6 Hz. The average signal velocity amplitude is of the order of 30 millimicron/sec. (3) The activities associated with the electric power generation from steam contributes to the level and complexity of noise. (4) Use of arrays enables determination of velocity and direction of travel of the seismic noise. Preliminary indications are that noise velocities higher than those associated with surface waves are observed at the Geysers. Coherence between wave trains is hard to observe at stations more than 1 km apart. Use of arrays seems to be a promising approach to decipher the complexity of seismic noise in geothermal areas.

THE HAWAIIAN-EMPEROR CHAIN AND ITS RELATION TO CENOZOIC CIRCUMPACIFIC TECTONICS

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The Hawaiian Ridge and Emperor Seamounts appear to form a single chain of tholeiitic shield volcanoes that erupted sequentially from NW to SE on the sea floor of the central Pacific Ocean during Tertiary and Quaternary time. The chain cuts obliquely across the older structural patterns of that sea floor. While the pattern of the chain as a whole is linear, the individual volcanoes lie on short, sigmoidal, en echelon loci that are subparallel with respect to each other and that may represent extensional features in the crust and upper mantle. The rate of progression of volcanism along individual loci is nonlinear where best studied in the southeastern part of the chain, and simultaneous eruptions appear to have occurred within a distance along the chain of about 200 to 400 km. The available data are consistent with a genesis related to the motion of the Pacific crust over a melting spot in the mantle. This melting spot, which may be due to either excess heat or pressure release, appears to have a diameter of about 300 km and is presently centered slightly north of the island of Hawaii. Our best estimate of the age of the Hawaiian-Emperor bend, based on the existing radiometric data, is 24.6 $\pm$ 2.5 m.y., which correlates with a time of increased tectonic activity in the western Pacific island arcs and with changes in the nature of the plate boundaries in the northern and eastern Pacific. The vector change in the motion of the Pacific plate with