evaluation of the Federal Mineral Estate and the ...vision of mineral production therefrom. The use ...physics in the overall management program has ... significantly since 1968 when budgetary ap... was granted to initiate procurement of high-...ity geophysical data to provide the subsurface ...ping support for a more effective mineral evalua... and lease-management program on the Outer ...ntinental Shelf. Since that date the Conservation ...vision has been active in developing, primarily, a ...physical data repository of high resolution and ...mmon depth point, digitally processed seismic re...ction data in selected OCS areas. In addition, a ...all but highly qualified geophysical interpretive ... of experienced personnel is presently providing ...port in each of the four OCS regional offices.

At the present time approximately 50,000 line-miles ... deep focus common-depth-point digital seismic re...ction data have been purchased and are under eval...ation by division geophysical personnel. An addi...nal 8000 line-miles of shallow focus, high-resolution ...physical data are under interpretive evaluation as ...rtains to lease management and hazard analysis deci...ons. More data, deep and shallow focus, are planned ... acquisition as new areas of the OCS are pro...rammed for evaluation. Refinement of the data and ...erpretation currently available will also be im...roved through application of new computer pro...rams under development to enhance data quality.

Onshore geophysics, time, personnel, and budget ...rmitting, will also play a more important role in ...ture development and management of the federal ...nds. Consideration for the use of portable refraction ...quipment and analysis of new geophysical techniques ... support the division mission are currently under ...chnical evaluation.

...eophysical Methods in Geothermal Exploration

NORMAN HARTHILL

Geothermal exploration is currently enjoying a ...oom in the United States but the state of the art is ...omparable to that of early petroleum prospecting. While little is known of the nature of geothermal reservoirs, the published data indicate that they are bod...es of superheated water located in porous rocks at depths between 1 and 3 km. The exploration problem ...s to define the location of this body of water, its vol...me, and temperature. The most characteristic physical parameter of superheated water is its high electrical conductivity. Many techniques of measuring earth conductivity have been used, but the one which has had most success is the dipole mapping method which is capable of delineating lateral conductivity changes down to depths of greater than 3 km with little effect from surface conditions. Depth control is supplied by time-domain electromagnetic sounding. These two techniques have been used in surveys in Central America, the United States, Indonesia, Mexico, and East Africa, and examples will be taken from them.

Design Principles for Synergic Spatial-Frequency Filters as Applied to Routine Seismic Recording

W. S. HAWES AND D. G. LANG

Proceeding from the well-known principles of spatial and frequency filters, a set of criteria and methods are presented for the design of synergic filter combinations. Such combinations can systematically utilize available hardware to assure maximum attenuation of coherent horizontally propagated interferences.

Simple procedures are developed for arriving at the "best" configuration of elements comprising the source and detector arrays. From the calculated response functions of these arrays, the best practical ratio of their lengths is defined. This ratio, together with the highest measured velocity of horizontally propagated interference (usually "ground roll") is used to assign specific and practical dimensions to the two arrays. The response of the source-detector combination is then computed and converted to the frequency domain.

The frequency response curve of the source-detector combination has an attenuation band and a passband. Interference frequencies lying in the passband will be recorded at the expense of signal unless they are attenuated by an appropriate high-pass filter. The correct parameters for this high-pass filter are readily definable by simple inspection of the frequency domain response function of the spatial filter.

The high-pass frequency filter, functioning together with the spatial filter, thus constitutes a synergic combination that will satisfy the critical objectives of field recording filters: minimum attenuation of the signal with maximum attenuation of the interference over the entire spectrum.

Underwater Imagery by Mapping Sonar

E. F. HAYE

The unique long range of the IFP mapping sonar now allows imagery of the sea bottom to be obtained which is quite comparable to air photography or radar imagery on land. The sonar scans out to a half mile on each side of a towed fish, making it practical for regional geologic sea-floor mapping. When used in conjunction with a vertical profile sparker, submarine geologic interpretations can be made that are superior to photogeologic interpretations on land.

There are two modes of operation of the sonar: (1) With proper placement of ship traverses, continuous imagery can be obtained comparable to a stapled airphoto mosaic. (2) The sonar fish can be pulled behind a seismic vessel, producing mile-wide strip-type con-