

quadrangle means of the horizontal component for the U.S., 10 overlapping areas are used. This technique can have distinct advantages over using one function for the entire area, because it can retain more detail and can be easily extended to include surrounding areas.

Many local anomaly maps are required to depict wavelengths as short as a few kilometers. Using the anomaly map of the State of Nevada, a local function representation, employing a double Fourier series, reduced the computer storage required to approximately one-fifth that required to store the original anomaly values; it also provided a partial interpretation of the map in terms of directional trends and depth to sources.

Gravity and Magnetic Evidence, Correlated With Plate Tectonics, Determine the Loci of Jurassic and Cretaceous Deposition in the Gulf of Mexico PM-4

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A review of the Gulf of Mexico-Caribbean region, based on geophysical and geologic evidence, indicates development of the Mesozoic, with special emphasis on the Louann Salt, was directly related to plate tectonics. The separation of the universal land mass, Pangaea, began during the Triassic approximately 200 million years ago. After 20 million years of drift, the present-day Florida Peninsula, the island of Cuba, and Yucatan Peninsula formed a barrier, extending from northeast to southwest, that created the locale for the deposition of approximately 5000 ft of Jurassic Louann salt over the slowly subsiding Gulf of Mexico.

An analysis of regional gravity-magnetic lineaments can be correlated with regional geologic data to confirm that the deposition of the Cretaceous, with special emphasis on the lower Cretaceous reef front, can be extended along the present edges of the Florida platform, the island of Cuba, and the Yucatan platform. Continued movement of the barrier position to the southeast permitted the deposition of extensive limestones along succeeding reef fronts throughout the Cretaceous. The continuing slow subsidence of the Gulf of Mexico basin, in conjunction with the southeast rotation of the respective platforms, provided a favorable environment for reef development.

The Laramide orogeny marked the beginning of the last pull-apart. At the close of the upper Cretaceous, Cuba separated from a position as the plug in the gap between the two major platforms and rotated to its present position. The Florida platform and Yucatan platform rotated to the southeast to occupy their present position in the Gulf of Mexico-Caribbean region.

This concept provides a better understanding for the location of Jurassic-Cretaceous deposition in the Gulf

of Mexico. As a result, the South Florida basin becomes an important hydrocarbon exploration objective.

Some Developments in Resistivity Prospecting PM-5

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A number of small improvements can produce a noticeable increase in speed and quality of results. Here are some of the improvements: Plastic depolarizable electrodes with insertions of porous wood are used instead of ceramic ones. They are unbreakable, small, sharp at the bottom, and of satisfactory contact resistance. A modified Schlumberger arrangement with the third current electrodes is used. The three sounding curves obtained for each station enable the "flattening" of deformations due to surface inhomogeneities. The speed of measurement is increased by the use of an automatic digital instrument. With the current kept constant, measured potentials can be plotted directly as apparent resistivities on properly marked logarithmic paper.

Interesting results are obtained in the search for building materials: delineating by resistivity the zones of low quality rock in quarries, and finding new layers of sand and gravel in areas already drilled. Measurements were made on the surface and also at the bottom of lakes.

Two-Dimensional Resistivity Inversion PM-6

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Often, adequate interpretation of resistivity data requires that the data be modeled with a 2-D earth. If the number of parameters in the 2-D model is large, and if the correlation between the parameters is obscure, trial and error modeling can be difficult and frustrating. In an effort to ameliorate this problem, we have written a program which inverts to the resistivities of 2-D model cells. The forward routine is based on the transmission surface analogy. The analytic derivatives of apparent resistivities in the transform domain with respect to model cell resistivities are equal to a simple polynomial in transform domain currents excited in the network by transmitters placed at receiver and transmitter sites. Thus, for the dipole-dipole array, any inversion on any number of cells requires only one forward problem per iteration. The Box-Kanematsu method is used to stabilize the step-size.

The program has been tested on synthetic and field data. In both cases, convergence is rapid when the program is used interactively and occurs even when the starting model does not provide a close fit to the data. Thus, the algorithm permits the interpreter to optimize rapidly resistivities of large numbers of parameters.

Inversion of Apparent Data Over Buried Structures Amenable to Transformation

Vinod K. Gaur and Roorkee, India*

We present a technique for interpretation with line sources structures of 2-D. Finding appropriate map such feature apparent resistivity to impose restrictivity of the geologic rithm is exemplified, a dipping, the cases of been presented.

Terrain Correction Surveys Using Transformation

Peter B. Papazian

A new method for dc resistivity upon the Schwarz maps potential for a more complex polygonal tract.

Terrain anomaly dipole-dipole method is then section in the Springs, Colorado calculated in the titative interpretation section.

Computational modeling has been speed and ability from none of element mode

Potential

An Updated South-Central The West

*Speaker

*Speaker §Preprint available