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QUARTERLY REPORT

period ending September 30, 1982
for
NASA contract NAS 5-26425

"Use of MAGSAT anomaly data for crustal structure
and mineral resources in the U.S. Midcontinent"

from

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NASA Goddard Space Flight Center

Technical Officer: Mr. H. Oseroff

(E83-10082) USE OF MAGSAT ANOMALY DATA FOR
CRUSTAL STRUCTURE AND MINERAL RESOURCES IN
THE US MIDCONTINENT Quarterly Report,
period ending 30 Sep. 1982 (Iowa Univ.) 5 p
Unclassified
CSCL 08G G3/43 001082
September 30, 1982
Work is proceeding with correlation of MAGSAT anomaly maps with geological and geophysical data sets. For example, an excerpt from the recent Bouguer gravity map of the U.S. (Hildenbrand et al., U.S.G.S., 1982) is Figure 1 attached here. It has been filtered to retain wavelengths of 250 km, thus being physically somewhat analogous to MAGSAT data at 400 km height, and we are now extracting residual anomalies to compare with the satellite magnetics (e.g. Figure 2 here).

We are awaiting the SEG's U.S. Magnetic Anomaly Map, due for pre-publication release in a week or two from now.

One graduate student is completing a thesis project using 3-dimensional magnetic modelling, and two others are beginning related geophysical studies.

Attached is a program excerpt from the upcoming SEG Annual Meeting (Dallas, October) with the session on MAGSAT results.

**Funds expended (July-Sept. 1982)**

Previously spent and committed (Dec. 1980-June 1982) $ 29,191.31

Committed in this Quarter:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies, materials, xerography, postage, computer</td>
<td>341.38</td>
</tr>
<tr>
<td>Wages: Research Assistantship, grad. student 1</td>
<td>850.00</td>
</tr>
<tr>
<td>Research Assistantship, grad. student 2</td>
<td>850.00</td>
</tr>
<tr>
<td>Investigator salaries (summer)</td>
<td>3,933.00</td>
</tr>
<tr>
<td>Overhead and Staff benefits (to University, for June-August)</td>
<td>3,151.39</td>
</tr>
<tr>
<td></td>
<td>9,125.77</td>
</tr>
</tbody>
</table>

Total to date $ 38,317.08
Figure 1. (reproduction quality not good; original is larger and in color)

Bouguer Gravity
\( \lambda > 250 \text{ km} \)
Color Interval 20 mgals

Hildenbrand, Shapiro, Godson, and Kane, U.S.G.S. (1962)
Figure 2.

1°x1° scalar data at 400 km altitude, high-pass filtered and reduced to the magnetic pole. Contour interval of 2 gammas. Zero-level is arbitrary. Processed from NASA Magsat satellite data.
Monday Morning, October 18

Papers from the AAPG Meeting

Session Chairman
Kevin M. Barry, Teledyne Exploration
J. Phillip Shannon, Margaret Weich, Exxon Production Research Co.


Countess Oil Field, Sout Canada A Case History graphic Tracer — A. M. W. Alex W. McCay Associa

How to Improve Your E1 Emulsion A Case Study — Oil Exploration & Produ

The Thinking Man’s Get John M. Parker, Consult Petroleum Geology of 1 Northwest Territories, D. R. Horn, and D. S. Ti Canada

The Gulf of Alaska A Case Study A. C. Amoco Production Co.

An Effective Exploration and Fal elongational Coi Migrating in the Denver Amoco Production Co.


Seismic I — Data Pt

Session Chairman
J. Swan Blankenship, Don A. Bennett, Texi Tram Co., Inc., R. C. Farrell, Seismic I Binning and Time — V. Seismic Data — P. S. S Digicon Inc.


Residual Migration — F. Rocca, Politecnico, and L. Salvador*, AGIP, Italy

High-Speed Interactive System for Interpretive Migration — A. J. Bethouret*, J. Edler, Delft Univ. on the Netherlands; and D. Laurson, GeoQuest International

Stacker Wavelet Deconvolution — M. Fatts*, K. Schleicher, C. Wason, and S. Ellender, GSI


Complex Phase Velocity and Mode Shape of Borehole Acoustic Waves — O. Y. Liu, Schlumberger Well Services


State of the Art in EVA Data Processing: An Improvement of a Tapeface Imaging — P. C. Arditty*, G. Arens, and Ph. Storl, Eau Aquitaine, France

Sonic Log Error Recognition and Correction by Winnow Inte — J. P. Castagna* and C. J. Sticking, Arco Oil and Gas

Potential Fields I — Computation Techniques

Session Chairman
Peter J. Hood, Energy, Mines, and Resources, Canada

D. M. Scheide, Defense Mapping Agency Interactive Modeling and Interpretation of Three-Dimensional Gravity Data — H. J. Coetz*, P. Keller, B. L. T. van der Plicht, R. van der Meer, Tech. Univ. of Clausthal, West Germany

Interactive Processing of Potential Fields as a Geologic Interpretation Tool Application to the Discovery of New Primary Petroleum Raw Materials — D. Chevot, IFP, P. Desbief, and A. Guillet, Bureau de Recherches Geologiques et Minieres, France


Direct Multilayer Interpretation of Gravity and Magnetic Anomalies — R. C. Hong*, Univ. of Texas, Dallas; W. J. Peeples, Univ. of Texas, El Paso; and C. L. V. Aiken, Univ. of Texas, Dallas

Generalized Linear Inversion of 2-Dimensional Geomagnetic Anomalies — S. F. Lal*, Univ. of Texas, Dallas; W. J. Peeples, Univ. of Texas, El Paso; and C. L. V. Aiken, Univ. of Texas, Dallas

Continuation of Potential Fields between Arbitrary Surfaces Using Equivalent Source Distributions — R. O. Hansen, EGG Geometrics


Resource Potential of the U.S. Midcontinent — R. S. Carmichael* and R. Black, Univ. of the

Satellite Magnetic Anomalies of Africa and Europe — R. Olivier*, Univ. of Lausanne, Switzerland; and R. B. van Kreurdine Univ.

Neutron Geophysics over Antarctica — M. H. Ritzscher* and C. R. Bentley, Geophysics and Polar Research Center, Univ. of Wisconsin

Satellite Lower Cutoff Magnetization from Magnet Data — C. C. Schnetzi, NASA

Materials Science

Revolution Energy for the Future

Session Chairman
Carolyn Delarg, Bell & Murphy

Energy for the Future — 17 min

Energy A Matter of Choices — 22 min

Adventures Oil and Gas offshore — 35 min

The Energy Leaders — 27 min

Energy for the 80’s — 28 min

A Play Half Written — 26 min

The Energy Adventure — 28 min

The Road to Energy, U.S.A. — 28 min

Geothermal Luncheon

Monday, 12:00 Noon

"Convention Center Exploration Psychology"

George V. Keller, Colorado School of Mines

Monday Afternoon, October 18

PC Presidential Session

Session Chairman
Edwin S. Travers, ARCO Oil and Gas Co.

"The United States: A New Era of Exploration Geophysics"

Richard J. Saliba, Mobil Oil Corp.


1982 Distinguished Lecture: Deconvolution, Use But Don’t Abuse — Sven Treitel, Amoco Research Center

Award Presentations: "Best Paper in Geophysics", "Best Presentation Awards"

Governmental Affairs Session

Session Chairmen and Moderators
Floyd J. comedian, American Society of Geophysical Co.

Hugh W. Hardy, GeoQuest International

"Energy and Governments — World Outlook and Various Viewpoints" — This special session will include presentations and a panel discussion with representatives from the U.S. Administration and representatives from other oil producing nations. Robert E. Wincoff, Executive Vice Chairman, Tenneco, and the Multianic Ricefield Company, will speak on "Energy from the Majors: Point of View"; and David K. Davis, Senior Vice President, Texas Independent Producers and Royalty Owners Association, will speak on "Energy from the independents: Point of View"