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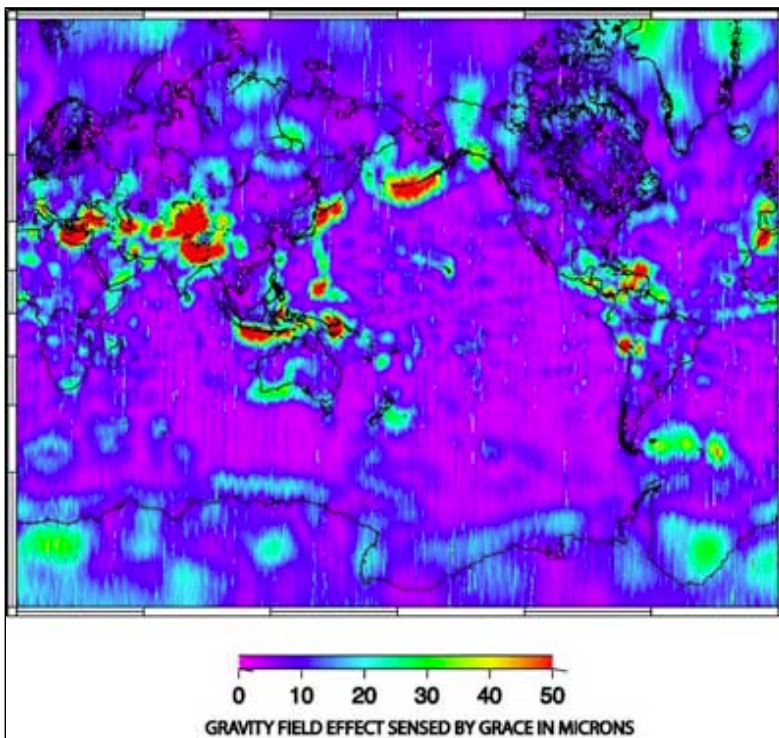
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## NASA's first gravity mission image depicts a bumpy ride

NASA NEWS RELEASE

Posted: December 9, 2002

The first image released from the Gravity Recovery and Climate Experiment (Grace), a joint NASA-German Aerospace Center mission, graphically illustrates the sensitivity of the mission's twin spacecraft to changes in Earth's gravity.



Earth, illustrating distance between Grace spacecraft. Credit: NASA

Color gradations in the image measure changes in the distance between the Grace spacecraft as they orbit overhead approximately 220 kilometers (137 miles) apart. Such variations are caused as the spacecraft fly over Earth's uneven gravity field, for example, when Grace travels over mountain ranges or undersea trenches. Earth's largest spatial features (those covering the largest areas of Earth) have been removed from this image so that such smaller features can be highlighted. Grace's extremely sensitive microwave ranging instrumentation is capable of measuring variations at the micron, or millionth of a meter, level.

Data from this and similar images will be processed by the Grace science team to produce precise maps of Earth's gravity field. Preliminary maps of Earth's geoid, or mean gravity field, are

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### New DVD

expected to be available to researchers in the spring of 2003.

Dr. Byron Tapley, Grace principal investigator from the Center for Space Research at the University of Texas in Austin, said Grace is already dramatically improving our knowledge of the geoid. "Errors in previous gravity field models were due to the effects of using data from multiple sources with uneven quality and incomplete geographic coverage," he said. "In 30 days, Grace has exceeded the information gained in over 30 years of previous study."

Launched March 17, 2002, Grace senses minute variations in Earth's surface mass and corresponding variations in Earth's gravitational pull. It will map these variations over time. The monthly gravity maps generated by Grace will be up to 1,000 times more accurate than current maps, substantially improving the accuracy of many techniques used by oceanographers, hydrologists, glaciologists, geologists and other scientists to study phenomena that influence climate. The mission is currently in its commissioning phase and the satellites are collecting science data.

Grace is a joint partnership between NASA and the German Aerospace Center (Deutsches Zentrum fuer Luft und Raumfahrt, or DLR). The University of Texas' Center for Space Research has overall mission responsibility. GeoForschungsZentrum Potsdam is responsible for the German mission elements. The Jet Propulsion Laboratory, Pasadena, Calif., manages the U.S. portion of the project for NASA's Office of Earth Science, Washington, D.C. Science data processing, distribution, archiving and product verification are managed under a cooperative arrangement between JPL, the University of Texas' Center for Space Research and the Geo-Research Center in Germany.

The California Institute of Technology in Pasadena manages JPL for NASA.

The conception, design, development, testing and launch history of the Saturn I and IB rocket is documented in this forthcoming three-disc DVD.



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