

The Earth is smaller than assumed: German researchers

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German researchers at the University of Bonn said that the world is smaller than first thought.

Although the discrepancy is not large, it is significant: Geodesists from the University of Bonn have remeasured the size of the Earth in a long lasting international cooperation project. The blue planet is accordingly some millimeters smaller than previously assumed.

The results are important, for example, to be able to demonstrate a climate contingent rise in sea level. The results have now appeared in the renowned *Journal of Geodesy*.

The system of measurement used by the Bonn Geodesists is invisible. It consists of radiowaves that are transmitted into space from punctiform

sources, the so-called Quasars. A network of more than 70 radio telescopes worldwide receives these waves. Because the gaging stations are so far apart from each other, the radio signals are received with a slight time-lag.

"From this difference we can measure the distance between the radio telescopes—and to the preciseness of two millimeters per 1,000 kilometers ", explained Dr. Axel Nothnagel, reasearch group leader for the Geodesy Institute of the University of Bonn.

The procedure is called VLBI, which stands for "Very Long Baseline Interferometry". The technique can be used, for example, to demonstrate that Europe and North America are distancing from each other at a rate of about 18 millimeters annually. The distance of the gaging stations from each other allows the the size of the Earth or the exact location of the center of the Earth to be determined.

"We have analyzed the measurements and calculations from 34 partners in 17 countries", explained Nothnagel. "A combination of GPS and satellite laser measurements will enable the availability of the coordinates from almost 400 points on the surface of the Earth with unparalleled exactness."

The results are the basis for a new coordinate system for the planet. With this system it would be possible, for example, to determine the track of so-called Altimeter-Satellites within a few millimeters precision. Altimeter-Satellites measure their altitude over the Earth's surface and can, for example, register a rise in sea level. Deviations from the flight path, however, falsify the result. If the satellite flies higher than expected, the distance to the surface of the Earth differentiates from what is recorded—the sea level appears lower than it really is.

Source: University of Bonn

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