Development of The Primary Torque Standard Machine

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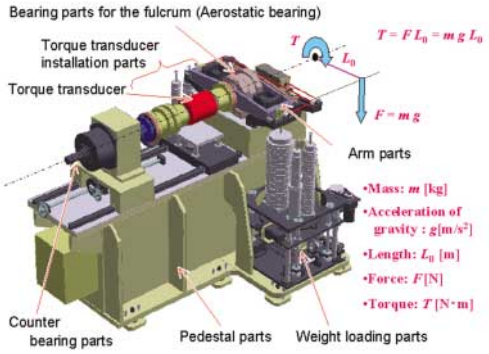
Research is being conducted at the National Metrology Institute of Japan (NMIJ), AIST, for the purpose of creating a technical base for a national torque standard and constructing a widely accepted torque traceability system. As part of the research, a torque standard machine of rated capacity 1 kN·m was developed. This machine has a variety of features enabling it to perform a precise measurement of torque. The arm length was precisely compensated for the influence of the deadweights loading, and temperature variation. An aerostatics bearing was adapted in order to minimize torque loss caused by friction at the fulcrum. The best measurement capability in the machine was brought within ±50 ppm for the calibration range from 5 N·m to 1 kN·m.



Standard machine

High-Energy Gamma-Ray CT using Laser-Compton Gamma-Rays

- A Novel Method for Nondestructive Evaluation of Bulk Materials -

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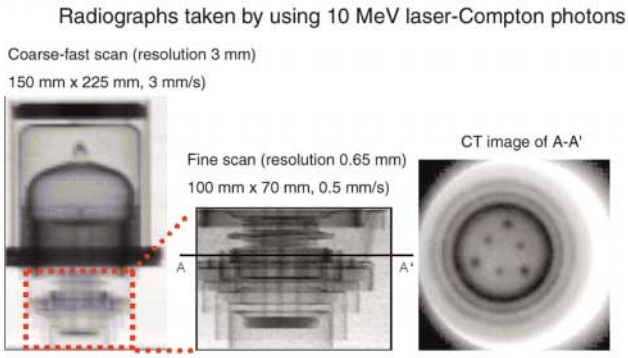
Transmission radiography and CT system for inspection of industrial products using a laser-Compton photon beam in the energy range 1 - 40 MeV have been developed. The photon beam, which is generated with the 300 - 800 MeV electron storage ring "TERAS" and various laser light systems, is continuously energytunable. The effectiveness of this method has been examined with radiographs and tomographies of metals, ceramics, and concrete blocks. The spatial resolution of the radiograph was measured to be 650 mm using a 10 MeV photon beam.



An example of nondestructive evaluation of bulk material using 10 MeV high-energy laser-Compton gamma-ray beam