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Development of an artificial vibration source by use of giant magnetostrictive material

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We can obtain many information about rock bed such as modulus of elasticity, attenuation,variation of stress and so on, utilizing elastic wave propagation. If we can make an artificial vibration source which is strong and easy to handle, we can easily know information about rock bed. Therefore, we have developed an artificial vibration source by use of a giant magnetostrictive material. A giant magnetostrictive material deform by applying magnetic field and a deformation is larger than other materials. This time we employed a giant magnetostrictive material with cylinder size of 40mm diameter and 150mm length. A coil is rolled up around the material and it is installed into a cylinder type vessel that is 60mm diameter and 300mm length. The vibration source can be drove by AC 100volt and output power is about 2000kgf. And it can drive wave forms made by an oscillator.

We will present the vibration source system and some experimental results.

Keywords: artificial vibration source, giant magnetostrictive material, development, elastic wave