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TOBA: a Ground-Based Mid.-Frequency Gravitational-Wave Antenna

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TOBA (TOrsion-Bar Antenna) is a mid.-frequency gravitational-wave antenna. It is formed by two bar-shape test masses, each suspended as a torsion pendulum. Tidal effect originated by incoming gravitational wave will be detected as differential angular motion of these two bars. The fundamental sensitivity is 10^(-19) Hz^(-1/2) at 0.1 Hz frequency band, assuming 10-m scale cryogenic detector. Though this sensitivity is not comparable with space antennae, it is sufficient to observe any intermediate-mass black-hole inspirals in our universe. Also, operation on ground is advantageous in development time and cost. In this presentation, we will overview the concept, development history and recent achievement of TOBA.

Primary authors: ANDO, Masaki (Univ. of Tokyo); Mr TAKANO, Satoru (Univ. of Tokyo); Mrs OOI, Ching Pin (Univ. of Tokyo); Mrs OSHIMA, Yuka (Univ. of Tokyo); Dr MICHIMURA, Yuta (Univ. of Tokyo)

Presenter: ANDO, Masaki (Univ. of Tokyo)

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