

Bulk Acoustic Wave devices for high-frequency gravitational wave antennas

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High-frequency gravitational wave (GW) detection based on a cryogenic bulk acoustic wave (BAW) cavity coupled to a superconducting quantum interference device (SQUID) has been under investigation at the University of Western Australia for several years. A recent paper reported the observation of rare events of uncertain origin using the first antenna of this type. In this report, we describe the work towards the construction of a similar GW antenna at the University of Milano Bicocca, including the characterisation of commercially available BAWs and plans to tailor the BAWs to sample multiple frequencies from about 0.5 MHz to a few tens of 1 MHz. Potential GW sources in this range include scenarios involving dark matter candidates such as primordial black hole binaries and axion-black hole interactions.

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