Poster Session #F
Gravitational Wave detectors and other sources

F08

Searching for High Frequency Gravitational Waves with Bulk Acoustic Wave Resonators

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We present the operation of a High Frequency Gravitational Wave (HFGW) detector based on a cryogenic acoustic cavity and report observation of rare events at MHz frequencies during 153 days of operation. Utilising a piezoelectric quartz bulk acoustic wave resonator as a resonant mass HFGW antenna, three strong events are observed as transients responding to energy deposition within acoustic modes of the cavity. The first event occurring on 12/05/2019 (UTC) has a footprint only on one mode, whereas the second and third events, separated by 13 minutes occurring on 27/11/2019(UTC), are observed via the simultaneous monitoring of two modes. Timing of thee events is checked against available environmental observations and well as data from other detectors. Various possibilities explaining the origins of these events are discussed. With the possibility of simultaneously monitoring many overtone modes across multiple resonators, quartz BAW based HFGW detectors could provide an efficient solution to gravitational wave astronomy at MHz frequencies. Employing natural techniques such as coincident analysis and cross correlation will allow future generations of this experiment to probe for exotic transient sources as well as a stochastic background of HFGWs