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The investigation of cavity frequency instability induced by vibrations

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The Beijing Electron-Positron Collider II (BEPC-II) is a 1.89 GeV two-ring e^+/e^- collider. It consists of two superconducting (SC) cavities in the ring and the design of the cavity is the same as the ones used in HEPS (High Energy Photo source) storage ring. During operation of the SC cavities of BEPC-II, sideband close to 46 Hz and 100 Hz were found, which decreased the controlling accuracy of the cavity frequency. To trace the vibration sources, PCB sensors were fixed on the rack which is connected directly with the cavity pipe. The whole starting up process of the BEPC-II after long shutting down were monitored for determining the vibration sources. To investigate the sensitivity of the cavity under different vibrations, 500 mV bias input voltage were added on the cavity using pizeo to produce longitudinal motions with frequencies from 10 Hz up to 150 Hz. With the same amplitude of bias voltage, the cavity has different response to vibrations with different frequencies. The preliminary results of the investigation will be presented in this paper.

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Footnotes

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Yes

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