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**Breathing mode of a harmonically trapped two-dimensional Fermi gas** CHAO GAO, ZHENHUA YU, Institute for Advanced Study, Tsinghua University, COLD ATOM THEORY GROUP AT IAS, TSINGHUA TEAM — For two-dimensional (2D) atomic Fermi gases in harmonic traps, the  $SO(2, 1)$  symmetry is broken by the inter-atomic interaction explicitly via the contact correlation operator. Consequently, the frequency of the breathing mode  $\omega_B$  of a 2D Fermi gases in a harmonic trap with frequency  $\omega_0$  can be different from  $2\omega_0$ , which is implied by symmetry. At zero temperature, we use the sum rules of density correlation functions to yield upper bounds for  $\omega_B$ . We further calculate  $\omega_B$  through the Euler equations in the hydrodynamic regime. The obtained value of  $\omega_B$  satisfies the upper bounds and shows deviation from  $2\omega_0$ .

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