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Breathing mode frequencies of a rotating Fermi gas in the BCS-BEC crossover region THEJA DE SILVA, Binghamton University — We study the breathing mode frequencies of a rotating Fermi gas trapped in a harmonic plus radial quartic potential. We find that as the radial anharmonicity increases, the lowest order radial mode frequency increases while the next lowest order radial mode frequency decreases. Then at a critical anharmonicity, these two modes merge and beyond this merge the cloud is unstable against the oscillations. The critical anharmonicity depends on both rotational frequency and the chemical potential. As a result of the large chemical potential in the BCS regime, even with a weak anharmonicity the lowest order mode frequency increases with decreasing the attractive interaction. For large enough anharmonicities in the weak coupling BCS limit, we find that the excitation of the breathing mode frequencies make the atomic cloud unstable.

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