Determination of the equation of state of a two-component Fermi gas at unitarity YONG-IL SHIN, MIT — We report on the measurement of the equation of state of a two-component Fermi gas of 6Li atoms with resonant interactions. By analyzing the in situ density distributions of a population-imbalanced Fermi mixture confined in a harmonic trap, we determine the energy density of a resonantly interacting Fermi gas as a function of the densities of the two components. The presence of the non-interacting ideal Fermi gas in the outer region of the trapped sample allows measuring the equation of state directly from the shape of the cloud without any absolute calibration of particle density. From the density profiles obtained at our lowest temperature, we estimate the zero-temperature equation of state. (Y. Shin, arXiv:0801.1523)

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