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FFLO phase in one-dimensional polarized Fermi gases XIA-JI LIU, HUI HU, PETER DRUMMOND, School of Physical Sciences, The University of Queensland — Based on the integrable Gaudin model and local density approximation, we discuss the phase structure of one- dimensional trapped Fermi gases with imbalanced spin populations for arbitrary attractive interactions. A phase separation state, with a polarized superfluid core immersed in an unpolarized superfluid shell, emerges below a critical spin polarization. Above it, a coexistence of polarized superfluid matter and a fully polarized normal gas is favored. These two exotic states could be realized experimentally in highly elongated atomic traps, and diagnosed by measuring the lowest density compressional mode. We identify the polarized superfluid as having an FFLO structure, and predict the resulting mode frequency as a function of the spin polarization.

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