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Trapped fermion mixtures with unequal masses: a Bogoliubov-de Gennes approach MENDERES ISKIN, CARL WILLIAMS, Joint Quantum Institute (UMd and NIST) — We use the Bogoliubov-de Gennes formalism to analyze the ground state phases of harmonically trapped two-species fermion mixtures with unequal masses. In the weakly attracting limit and around unitarity, we find that the superfluid order parameter is spatially modulated around the trap center, and that its global maximum occurs at a finite distance away from the trap center where the mixture is locally unpolarized. As the attraction strength increases towards the molecular limit, the spatial modulations gradually disappear while the Bardeen-Cooper-Schrieffer (BCS) type nonmodulated superfluid region expands until the entire mixture becomes locally unpolarized.

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