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Apparatus for Ultra-Cold Fermion Interferometry[1] SETH AUBIN, AIYANA GARCIA, BRIAN DESALVO, Dept. of Physics, College of William and Mary — We present progress on the construction of an apparatus for ultra-cold fermion interferometry experiments. The apparatus consists of two connected glass vacuum cells: Fermionic potassium (^{40}K) and bosonic rubidium (^{87}Rb) atoms are cooled and collected in a dual-species magneto-optical trap (MOT) in the first cell and are then transported magnetically to the second cell, where they are loaded into a micro-magnetic chip trap. We use radio-frequency (RF) evaporation to cool the rubidium atoms, which in turn sympathetically cool the potassium atoms. The apparatus takes advantage of the rapid cooling inherent to micro-magnetic traps, while also benefiting from the ultra high vacuum achievable with a two chamber vacuum system. In describing our experimental approach, we address the experimental challenges and possible force-sensing applications of fermion interferometers on chips.

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