

Abstract

Building local probes of gravity is of interest for both fundamental and environmental research. A compact as well as precise device for this purpose from the perspective of mobility is the demand and matter-wave interferometry is one of the interesting possible answers. The central idea of our setup is to make a gravimeter incorporating levitated cold Caesium atoms below an atomchip and an optical double well potential for interferometry. Cs is heavy and hence the associated wavelength is shorter indicating a sensitive equipment. A Cs BEC as matter-wave source is also an interesting candidate because of its tunable interactions, which provide an opportunity to explore and optimize it for interferometry. The challenge of this experiment is to encapsulate a 2D MOT, 3D MOT, atomchip, Feshbach coils for Cs atom scattering length tuning, optical dipole trap for BEC, double well potential optics, and imaging, all in a compact setting of roughly 1m^3 .