Optical frequency standards for gravitational wave detection using satellite velocimetry AMAR VUTHA, York University — Satellite Doppler velocimetry, building on the work of Kaufmann [1] and Estabrook and Wahlquist [2], is a complementary technique to interferometric methods of gravitational wave detection [3]. This method is based on the fact that the gravitational wave amplitude appears in the apparent Doppler shift of photons propagating from an emitter to a receiver. This apparent Doppler shift can be resolved provided that a frequency standard, capable of quickly averaging down to a high stability, is available. We present a design for a space-capable optical atomic frequency standard, and analyze the sensitivity of satellite Doppler velocimetry for gravitational wave astronomy in the milli-hertz frequency band.