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**Atom interferometric measurement of "Big G" on the International Space Station**[1] ELIZABETH ASHWOOD, DOGA MURAT KURKCUOGLU, Georgia Southern University, CHARLES W. CLARK, Joint Quantum Institute, MARK EDWARDS, Georgia Southern University — Recent measurements of Newton's universal gravitational constant ("Big G") using atom interferometric methods have increased the uncertainty in the value of this important fundamental constant[2]. We have developed tools for rapid simulation and evaluation of atom interferometer (AI) schemes that can be implemented in the Cold Atom Laboratory to be deployed to the International Space Station (ISS) in 2017. We have approximated the solution of the rotating–frame Gross–Pitaevskii equation in both one and three dimensions by using the Lagrangian Variational Method (LVM). The LVM trial wave function is a sum of $N_c$ Gaussian clouds and we have derived equations of motion for the centers, widths, and phase parameters of these clouds. These equations of motion can be rapidly solved for many different AI designs enabling the estimation interferometer sensitivity and the effects of errors. We present two potential schemes as for measuring "Big G" on the ISS. These include a Mach–Zehnder–like scheme as well as a design similar to a Foucault Pendulum.

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[2]See, e.g., S. Schlamminger, *Nature* **510**, 478 (2014)

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