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Potential Wells and the Generalized Uncertainty Principle CONSTANCE OWENS, GARDO BLADO, VINCENT MEYERS, Houston Baptist University, Department of Mathematics and Physics, 7502 Fondren Rd, Houston TX, 77074 — Out of the four fundamental forces, we have yet to be able to unify gravity with the other three forces. This predicament has kept scientists from being able to explain systems that use both general relativity (GR) and quantum mechanics (QM). The quest to quantize gravity, in other words to make GR a quantum theory, has been at the forefront of physics research in recent decades. Incorporating gravity into QM changes the laws of ordinary quantum mechanics. Potential wells are a common tool used to study particle behavior in quantum mechanics. At first they were simply theoretical toy models, but within time it was discovered that potential wells could actually be used to model real-life situations and thus have proven to be very useful theoretically and experimentally. For example, the double square well (DSW) can be used to model the potential experienced by an electron in a diatomic molecule. DSWs can also be used to study bilayer systems. In this paper we derive the results for the finite square well and the DSW using a form of the generalized uncertainty principle to study and discuss how the incorporation of gravity modifies these results. We also discuss applications and the effects of gravity on quantum tunneling.

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