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Gravitational time dilation, free fall, and matter waves

Wednesday, 8 June 2022 16:00 (15 minutes)

I demonstrate that a de Broglie wave of a particle in a gravitational field turns towards the region of a smaller gravitational potential, causing the particle to fall. This turning is caused by clocks running slower in the smaller potential. I use the analogy of ocean waves that are slower in shallower water and turn towards beaches. This approach explains the free fall qualitatively and quantitatively without postulating motion along geodesics and with only elementary algebra.

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