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Elementary particles for Engineers

Introducing elementary particles to science and engineering students (non-physics majors), poses both a challenge and an opportunity. The challenge lies in the inherently limited scope of the topic, which is usually taught as part of an elective modern physics course. The opportunity lies in being able to share the beauty of our subject with people who are motivated to learn and tend to focus more on conceptual insights and less on complex mathematical formulations.

I will describe my approach, in which I take students of an introductory course on quantum mechanics on a fascinating (and short!) journey from the classical harmonic oscillators and standing waves that everyone is familiar with to particles as excitations/waves of quantum fields. We discuss other problems that are naturally related to this framework, including the double-slit experiment, wave-particle duality, particle decays, and the quantum vacuum. After further simplification, this treatment could satisfy curiosity of talented high school students.

Secondary track

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