

Mathematical Physics

The Friedrichs Model and its use in resonance phenomena

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We present here a relation of different types of Friedrichs models and their use in the description and comprehension of resonance phenomena. We first discuss the basic Friedrichs model and obtain its resonance in the case that this is simple or doubly degenerated. Next, we discuss the model with N levels and show how the probability amplitude has an oscillatory behavior. Two generalizations of the Friedrichs model are suitable to introduce resonance behavior in quantum field theory. We also discuss a discrete version of the Friedrichs model and also a resonant interaction between two systems both with continuous spectrum. In an Appendix, we review the mathematics of rigged Hilbert spaces.

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