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Kink-antikink scattering in a quantum vacuum

Tuesday, 23 August 2022 15:10 (20 minutes)

We study kink-antikink scattering in the sine-Gordon model in the presence of interactions with an additional scalar field, ψ , that is in its quantum vacuum. In contrast to the classical scattering, now there is quantum radiation of ψ quanta and the kink-antikink may form bound states that resemble breathers of the sine-Gordon model. We quantify the rate of radiation and map the parameters for which bound states are formed. Even these bound states radiate and decay, and eventually there is a transition into long-lived oscillons.

Primary authors: ZAHARIADE, George; SFAKIANAKIS, Evangelos; MUKHOPADHYAY, Mainak (Arizona State University); VACHASPATI, Tanmay (Arizona State University)

Presenter: ZAHARIADE, George

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