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Quantum Rabi Model in Quantum Technologies JULEN PEDERNALES, URTZI LAS HERAS, LUCAS LAMATA, University of the Basque Country, Spain, ENRIQUE SOLANO, University of the Basque Country and IKERBASQUE, Spain — We will discuss how to simulate a wide range of regimes of the Quantum Rabi Model (QRM) in quantum platforms as trapped ions and circuit QED. Directly accesible regimes of the QRM correspond to a very narrow set of values of the ratio between the coupling strength and the characteristic frequencies of the system, typically in the strong coupling regime or in the perturbative zone of the ultrastrong coupling regime. However, with analog and digital quantum simulation techniques we can access the most elusive regimes of the QRM. Recent theoretical developments have disclosed a plethora of physical phenomena appearing at these previously unexplored regimes of the QRM, making its experimental implementation timely and of high interest.

Julen Pedernales
University of the Basque Country, Spain

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