## **SCET Workshop 2022**



Contribution ID: 38

Type: not specified

## Simulating collider physics on quantum computers using SCET

Friday 22 April 2022 12:00 (20 minutes)

Quantum simulations of the full dynamics of a quantum field theory over a wide range of energies requires exceptionally large resources. Yet for many observables in particle physics, perturbative techniques are sufficient to accurately model all but a constrained range of energies within the validity of the theory. SCET naturally provides an efficient separation of dynamics well-described by pertubation theory from those requiring additional treatment, and we present a formalism to embed the results of quantum calculations into SCET-like theories. As an explicit example we calculate the zero- and one-particle emission contributions to the soft function of an SCET-like treatment of massless scalars and compare to simulations on an IBMQ quantum processor. We also report on preliminary work extending these results to abelian gauge theories.

Author: FREYTSIS, Marat (Rutgers University)

**Co-authors:** BAUER, Christian Walter (Lawrence Berkeley National Lab. (US)); NACHMAN, Ben (Lawrence Berkeley National Lab. (US))

Presenter: FREYTSIS, Marat (Rutgers University)

Session Classification: Other