The 38th International Symposium on Lattice Field Theory

LATTICE 21

JULY 26-30 2021, ZOOM/GATHER@MIT

Contribution ID: **642** Type: **Plenary presentation**

Lattice Meets Lattice - Application of Lattice Cubature to Models in Lattice Gauge Theory

Friday 30 July 2021 02:20 (20 minutes)

In this joint venture between mathematicians and physicists, we develop efficient recursive strategies to tackle a class of high dimensional integrals having a special product structure with low order couplings, motivated by models in lattice gauge theory. A novel element of this work is the potential benefit in using a family of numerical integration methods called "lattice cubature rules". The group structure within lattice rules combined with the special structure in the physics integrands may allow efficient computations based on Fast Fourier Transforms. Applications to the quantum mechanical rotor and compact U(1) lattice gauge theory in two and three dimensions are considered.

Co-authors: Tobias Hartung (The Cyprus Institute), Karl Jansen (DESY Zeuthen), Ian Sloan (UNSW Sydney), Hernan Leovey (AXPO Trading & Sales), Dirk Nuyens (KU leuven)

Primary author: KUO, Frances (University of New South Wales)

Presenter: KUO, Frances (University of New South Wales)

Session Classification: Plenary

Track Classification: Invited plenary