Contribution ID: **207**                                    Type: **Oral presentation**

# A numerical and theoretical study of multilevel performance for two-point correlator calculations

*Friday 30 July 2021 06:00 (15 minutes)*

Multilevel techniques in lattice were introduced twenty years ago by Lüscher and Weisz as a way to overcome exponential signal-to-noise decay in lattice gauge theory. It is known that the algorithm performs well when the correlation length of the system is small, and less favourably when it is large. In this project, the transition between these regimes is studied. The 2D-Ising Model is used as a test system for calculating two-point functions across a range of correlation lengths. We go on to develop a theoretical framework that gives excellent predictions of the numerically observed performance boost.

**Author:**   KITCHING-MORLEY, Ben (University of Southampton)

**Presenter:**   KITCHING-MORLEY, Ben (University of Southampton)

**Session Classification:**   Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)

**Track Classification:**   Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)