

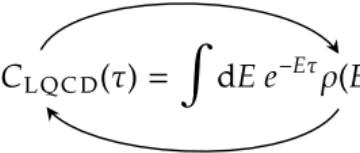
# Extracting spectral densities from Lattice QCD correlators

## The problem

**ill-posed**

$$C_{\text{LQCD}}(\tau) = \int dE e^{-E\tau} \rho(E)$$

straightforward



## Why?

### Non-perturbative calculation of observables

- ▷ Inclusive and exclusive rates
- ▷  $\tau$  and heavy mesons decays
- ▷ Radiative leptonic decays
- ▷ Spectroscopy, DIS ecc.

## How?

### Robust innovative techniques

- ▷ HLT (PRD 99, 094508)
- ▷ Machine Learning (arXiv:2307.00808)

## Applications

### The $R$ -ratio (PRL 130, 241901)

