Contribution ID: **265** Type: **Talk**

QCD Anderson transition with overlap valence quarks and influence of external magnetic fields

Friday 7 November 2025 15:30 (20 minutes)

The QCD Anderson transition is believed to be connected to both, confinement and chiral symmetry breaking. We investigate the latter relation by studying the low-lying eigenmodes of the overlap operator in the background of gauge configurations with 2+1+1 quark flavors of twisted-mass Wilson fermions. The mobility edge, below which eigenmodes are localized, is estimated by the inflection point of the relative volume. Contrary to the previous prediction 1, this estimate does not vanish at the temperature of the chiral phase transition 2. We discuss a possible scenario, supported by literature, for why this could be the case and present an alternative observable as a measure of localization.
Since it is known that external magnetic fields reduce the chiral as well as the deconfinement transition temperature, the second part proceeds with a study of staggered fermions in the presence of different magnetic field strengths. First results will be presented and the apparent influence on the QCD Anderson transition will be discussed.

\[1\] R. Kehr, D. Smith, L. von Smekal, PRD 109 (2024) 074512.
\[2\] R. Kehr, L. von Smekal, PoS LATTICE2024 (2025) 189.

Parallel Session (for talks only)

QCD at nonzero temperature and density

Authors: MARQUES VALOIS, Adeilton Dean; VON SMEKAL, Lorenz; KEHR, Robin (Justus Liebig University Giessen)

Presenter: KEHR, Robin (Justus Liebig University Giessen)

Session Classification: QCD at nonzero temperature and density