

# Including heavy spin effects in the investigation of $\bar{b}\bar{b}ud$ tetraquark candidates with lattice QCD static potentials

Andre Zimmermann-Santos<sup>\*1,2</sup>, Jakob Hoffmann<sup>1</sup>, Marc Wagner<sup>1</sup>

<sup>1</sup>) Institut für Theoretische Physik, Goethe-Universität Frankfurt am Main

<sup>2</sup>) Deutsches Elektronen-Synchrotron, DESY Hamburg

\* [andre.zimmermann@desy.de](mailto:andre.zimmermann@desy.de)

The study of exotic hadrons composed of four or more valence quarks is very challenging, both from theoretical and experimental perspectives. In this context, the particular class of states composed of two heavy antiquarks,  $\bar{b}\bar{b}$ , and two light quarks,  $ud$  is a promising system in the search for tetraquark candidates.

In this talk, I present an approach to investigate such a system in the Born-Oppenheimer approximation using lattice-QCD static potentials. In the static limit, spins of the heavy particles are irrelevant. To go beyond that limit, we have developed a formalism to include  $\bar{b}\bar{b}$ -spin corrections for arbitrary angular momentum. I will discuss and apply it in the context of a possibly existing  $\bar{b}\bar{b}ud$  resonance with quantum numbers  $I(J^P) = 0(1^-)$ .