

## In medium Langevin dynamics of heavy particles

### Content

Heavy quarks and their bound states are ideal probes of the quark gluon plasma formed in relativistic heavy ion collisions. Due to the hierarchy of scales of the system, the in medium dynamics can be modeled by a Langevin equation in which interactions between the medium and the heavy particle take the form of random “kicks” altering the particle’s momentum. The hierarchy of scales makes the problem ideally suited for the use of effective field theories (EFT) and the formalism of open quantum systems (OQS). We utilize these tools to perform a first principles treatment of these heavy particles in medium and analyze the regimes in which the dynamics take the form of a Langevin equation.

### Summary

**Primary author(s) :** BRAMBILLA, nora (tum); VAIRO, Antonio (TUM); VANDER GRIEND, Peter (Technical University of Munich)

**Presenter(s) :** VANDER GRIEND, Peter (Technical University of Munich)