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## Excited Hadron Channels in Hadronization

*Tuesday, 5 September 2023 13:00 (20 minutes)*

The proper treatment of hadronic resonances plays an important role for many aspects of heavy ion collisions. We expect this to be the case also for hadronization, due to the large degeneracies of excited states, and the abundant production of hadrons from their decays. We show how a comprehensive treatment of excited meson states can be incorporated into quark recombination, and in extension, into Hybrid Hadronization. We discuss in detail the quantum mechanics of forming excited states, utilizing the Wigner distribution functions of angular momentum eigenstates of isotropic 3-D harmonic oscillators. We describe how resonance decays can be handled, based on a set of minimal assumptions, by creating an extension of hadron decays in PYTHIA 8. Finally, we present a study of hadron production by jets using PYTHIA and Hybrid Hadronization with excited mesons up to orbital angular momentum  $L=4$ . We find that states up to  $L=2$  are produced profusely by quark recombination.

### Category

Theory

### Collaboration (if applicable)

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**Session Classification:** New Theory

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