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## A Time Reclustering Algorithm for Jet Quenching Studies

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Ultra-relativistic heavy-ion collisions have unlocked the study of a hot, dense state of QCD matter, the Quark-Gluon Plasma (QGP). However, due to its short lifetime, on the yoctosecond scale, the QGP must be studied with recourse to external probes, such as jets, collimated sprays of particles originated from the hard scattering.

Since jets are multi-scale probes, we can use jet quenching, the collection of medium modifications of the jets' substructure, to study the evolution of medium properties at various times

In this work, we show that one can assign a time structure to jets by using the formation time of a parton' s emission. The obtained clustering history can be accurately reconstructed, and the medium modifications can be studied at various timescales, potentiating future tomographic measurements of the QGP.

Further, by classifying jets according to the formation time of the first unclustering step, one can select, out of an inclusive measurement, jet populations that were strongly modified by the QGP. This selection of jet populations by their quenching magnitude can help to distinguish specific features of jet-QGP interaction.

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