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Analysis of Z+jet Simulations in Pythia and Fastjet pp at \sqrt{sNN} = 7 TeV CHADWICK RAINBOLT, UC Davis Nuclear Physics Group — The focus of this research is to simulate Z^0 +jet events with the Pythia event generator. Pythia can yield the final state particles of a pp interaction. Pythia simulates an event and stores all of the information of each particle involved. Those particles can be entered into Fastjet, which is an algorithm made to cluster hadrons into jets, which correlate to the momentum of quarks and gluons. The Pythia analysis finds the leading quark in the pp simulation. Since quarks cannot exist in free space, the leading quark breaks off into many stable hadrons. This hadronization produces particles that have similar momenta, which look like a jet. Fastjet clusters the particles together in an attempt to estimate the original momenta of the quarks and gluons. The Pythia quark momentum and one of the Fastjet jets should be similar. Comparing these two can determine how accurately the Fastjet algorithm is at finding jets. The p_T of the found jet will then be compared to the p_T of the opposing Z^0 . To leading order, both of these p_T 's should balance. This kind of study is useful to estimate the energy of quarks in Z^0 +jet events in heavy-ion collisions.

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