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Hadronic jet-vertex association in a high-luminosity environment at the LHC[1] DAVID MILLER, Stanford/SLAC, ATLAS COLLABORATION — The LHC physics program will ultimately probe not only the highest energies ever produced in the laboratory but also the most numerous and frequent collisions between hadronic particles ever. These particle luminosities, much above the current Tevatron values, will produce hadronic jets from simultaneous uncorrelated proton-proton collisions in unprecedented numbers, thus introducing challenges for jet identification and association with the primary collision vertices, jet energy measurements and missing energy resolution. We continue work first introduced by the Tevatron experiments to combine tracking information with calorimeter jets in order to disentangle this jet background. Using an algorithm which assigns a jet-vertex association probability, jet selection is shown to be insensitive to the contributions from these "pile-up" collisions, which is essential for the many physics analyses dependent on event jet multiplicity. Furthermore, jet-by-jet multiple interaction energy corrections are now possible and improvements to the primary vertex identification from jet-vertex association are gained for several interesting physics processes.

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