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## **Matrix Element Method with Graphics Processing Units (GPUs)**

*Monday, October 14, 2013 3:00 PM (45 minutes)*

The Matrix Element Method has been used with great success in the past several years, notably for the high precision top quark mass determination, and subsequently the single top quark discovery, at the Tevatron. Unfortunately, the Matrix Element method is notoriously CPU intensive due to the complex integration performed over the full phase space of the final state particles arising from high energy interactions. At the Large Hadron Collider (LHC), high luminosities mean much larger numbers of events to analyse than we had at the Tevatron. This makes the Matrix Element method difficult to use, particularly now that computing resources are being utilised already at capacity. We have studied the feasibility of using Graphics Processing Units (GPUs) to reduce the computing time required for the measurement of Higgs decaying to two muons at the LHC. We present the technical approach followed, the speed-up gained, and the prospects for future improvements in the analysis through the use of GPUs.

**Primary authors:** Dr HARRINGTON JR, Robert Duane (University of Edinburgh); Mr LLOYD, Stephen (University of Edinburgh)

**Co-author:** BUCKLEY, Andy (University of Edinburgh (GB))

**Presenter:** Mr LLOYD, Stephen (University of Edinburgh)

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