**Discovery at the Tevatron Enhanced by Sharing of Computing resources through the Open Science Grid.**

A significant output of the sustained ASCR support for collaboration of physicists and computer scientists through the Open Science Grid[[1]](#footnote--1) is the effective sharing of resources and middleware and movement away from the traditionally “stove-pipe” solutions in High Energy Physics. One result of this collaboration is the over 100 results published by CDF and D0 in the past 12 months. These results have benefited from the value provided by dynamically adding and sharing distributed computing resources accessible through the joint activities of domain and computer scientists in the Open Science Grid.

One of the significant scientific results thus published is a reduction in the window of the allowed mass of the Higgs particle[[2]](#footnote-0). In a news release in March 2009, the Tevatron collaborations announced a significant step with a joint result shrinking the Higgs mass window by a factor of almost 10 (from a few hundred GeV to about forty GeV), providing a 135GeV +- 15% target region for future discoveries at the Tevatron and LHC.

Scientists continue to use the distributed computing resources accessible through the OSG, even as the LHC data taking ramped up, to improve accuracy of the measurement and publish other results.

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| **Direct Higgs Search at Tevatron**  **now excluding high mass higgs.** | **Top and W masses now known to**  **0.3% and 0.75% respectively. => Constrain Higgs via Quantum effects.** |

1. And from 2000-2006 the Particle Physics Data Grid. [↑](#footnote-ref--1)
2. See [press release](http://www.fnal.gov/pub/presspass/press_releases/Higgs-mass-constraints-20090313.html) The prevailing theory of mass predicts a “Higgs” particle, and all its properties, except its mass. [↑](#footnote-ref-0)