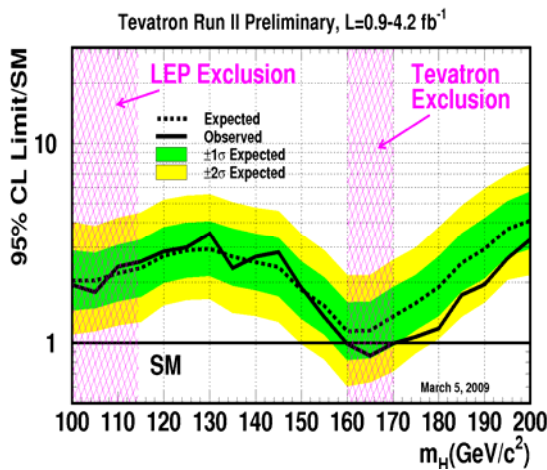


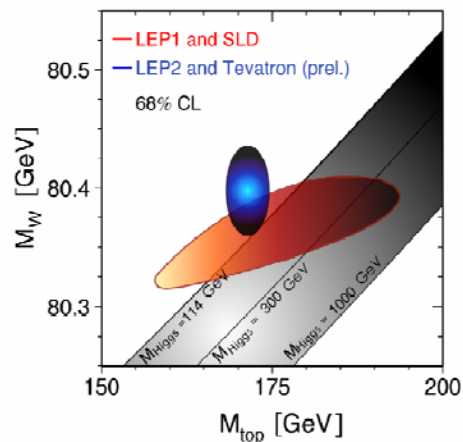
## Discovery at the Tevatron Enhanced through the Open Science Grid.

Sustained ASCR support for the Open Science Grid, a team of physicists and computer scientists, has resulted in advances in our understanding of the methodologies and frameworks of large-scale distributed computing as well as the more effective sharing of more than 20 computing sites by experiments at the Tevatron in Batavia, Illinois. The Open Science Grid team applies the conceptual insights gained on a national distributed infrastructure that breaks traditional boundaries across science communities and computing facilities, and has facilitated 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 the 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<sup>1</sup>. 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 135 GeV  $\pm$  15% target region for future discoveries at the Tevatron and LHC. Scientists continue to use the resources accessible through the Open Science Grid to improve the accuracy of the measurement and publish other results, even as other usage of the infrastructure (analysis of the data from the Large Hadron Collider at CERN) ramps up.



Direct Higgs Search at Tevatron  
Excludes a high mass Higgs.



Top and W masses now known to  
0.3% and 0.75% respectively.  
=> Constrain Higgs via Quantum effects.

<sup>1</sup> See [press release](#). The prevailing theory of mass predicts a “Higgs” particle, and all its properties, except its mass.