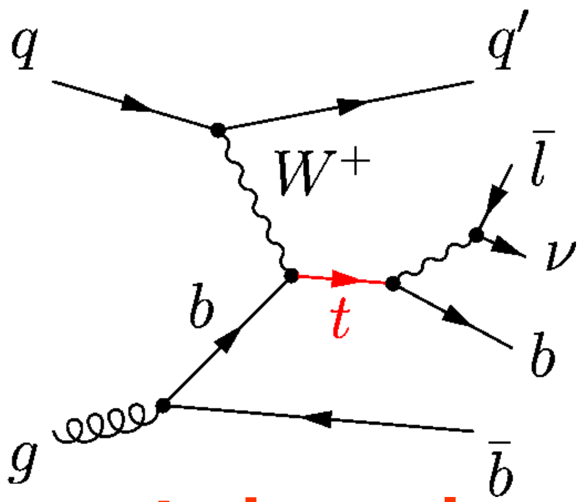
quark - lepton
Karlsruhe, GER, Sept 1-4, 2010

Tevatron Combination of Single Top Quark Production and V_{tb} Measurement

KIT Karlsruhe Institute of Technology

Jan Lueck (KIT) on behalf of the CDF and DØ collaborations

Motivation



t-channel

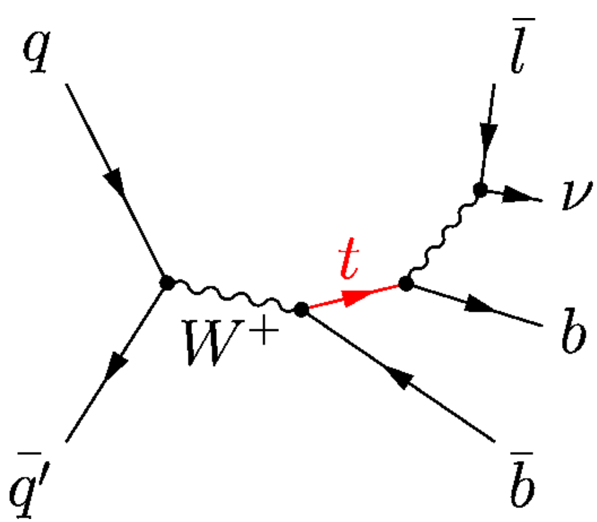
PHYSICAL REVIEW D VOLUME 34, NUMBER 1 1 JULY 1986

Production of heavy quarks from *W*-gluon fusion

Scott S. D. Willenbrock and Duane A. Dicus
Theory Group and Center for Particle Theory, University of Texas, Austin, Texas 78712
(Received 3 February 1986)

We show that heavy-quark production via *W*-gluon fusion in high-energy pp and $\bar{p}p$ collisions is an important source of the heavier member of an $SU(2)_L$ doublet of quarks if the mass splitting within the doublet is large. *W*-gluon fusion exceeds the strong production of heavy quarks for mass splittings greater than 300—350 GeV at $\sqrt{s}=10$ TeV and 400—450 GeV at $\sqrt{s}=40$ TeV. An al-

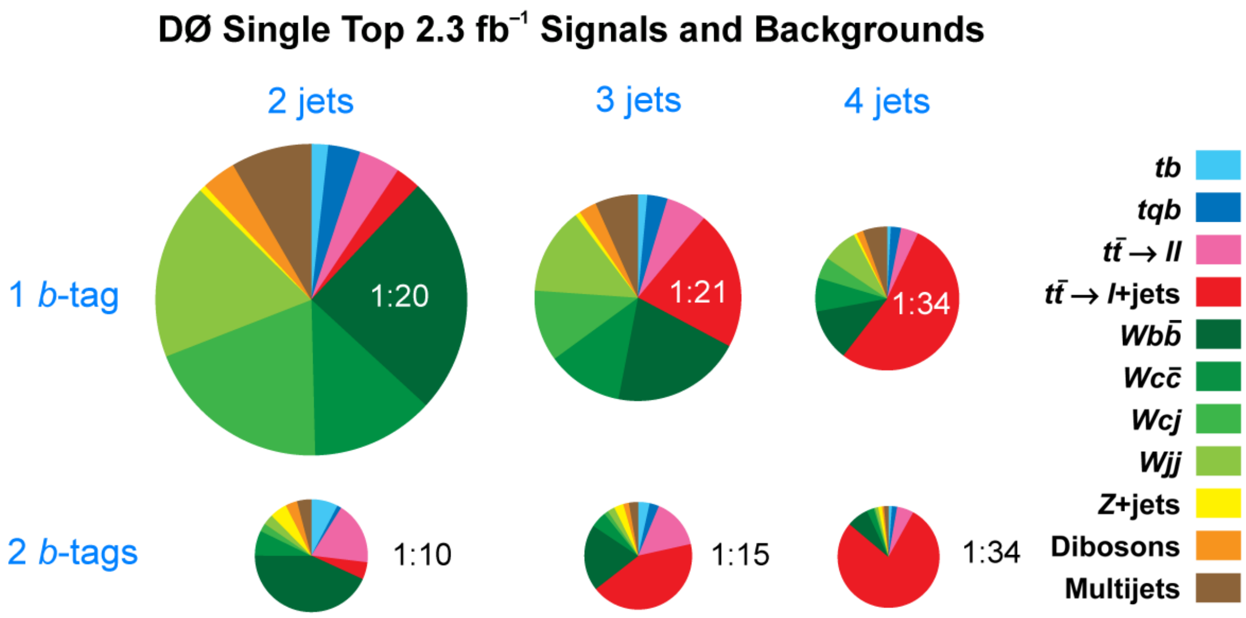
Scott Willenbrock, Duane Dicus, Phys. Rev. **D34**, 155 (1986).



s-channel

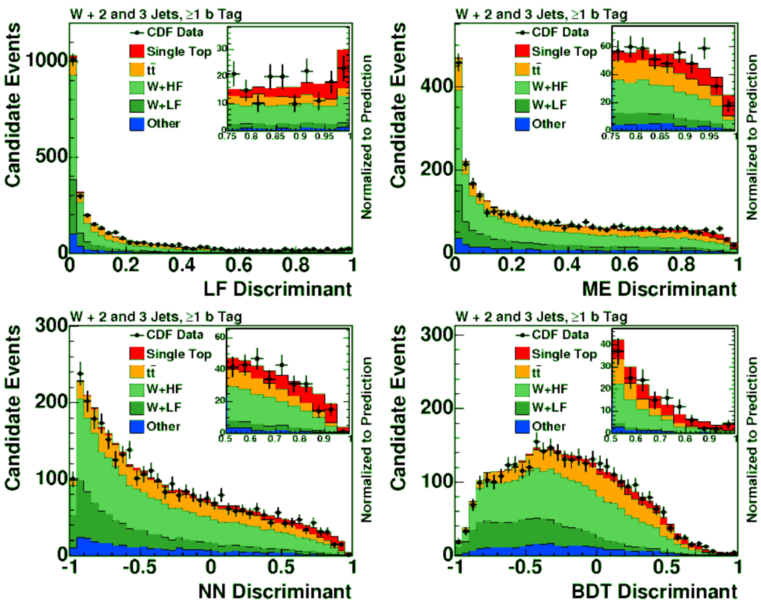
- Test of SM, s vs. t sensitive to BSM
- Direct Measurement of $|V_{tb}|^2$
- Same techniques as in WH Searches
- Milestone for WH Searches at the Tevatron
- Test of b quark PDF, top polarization

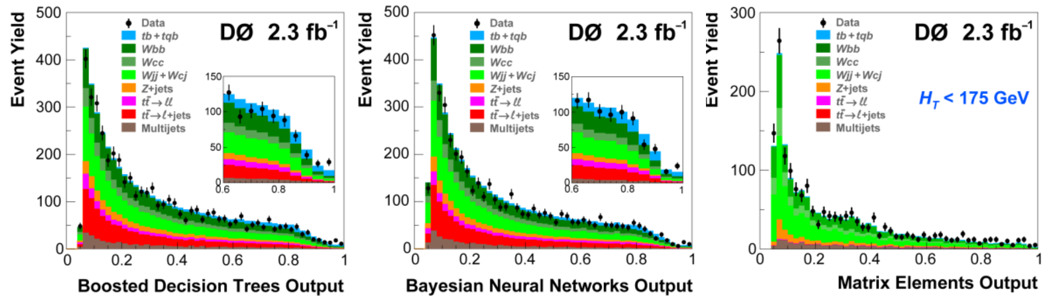
Ingredients I



DØ further splits dataset into e, μ and Run IIa, IIb: 24 channels
CDF splits into (non-)triggered leptons, but no 4 jets: 8 channels
CDF further uses 3 channels in MET+jets data (with lepton veto)

Ingredients II

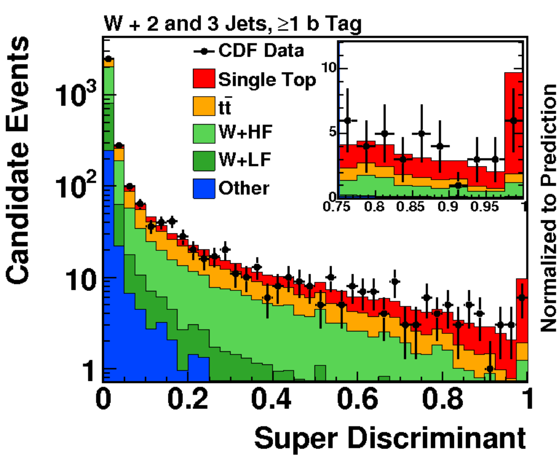


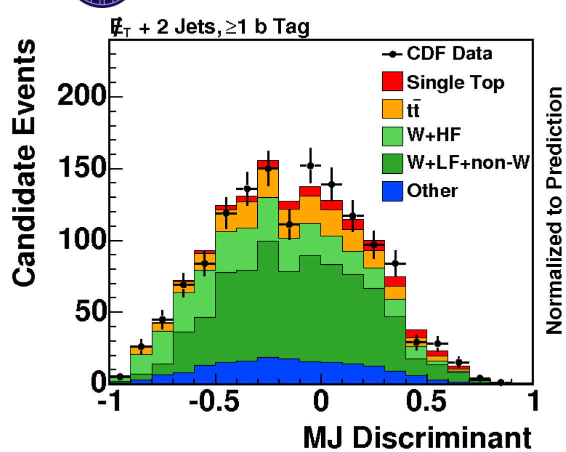


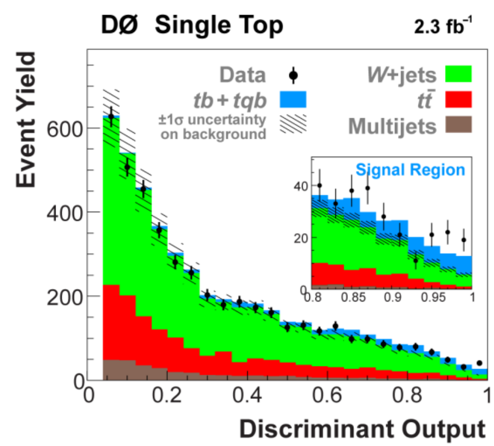
4 parallel analyses

3 parallel analyses

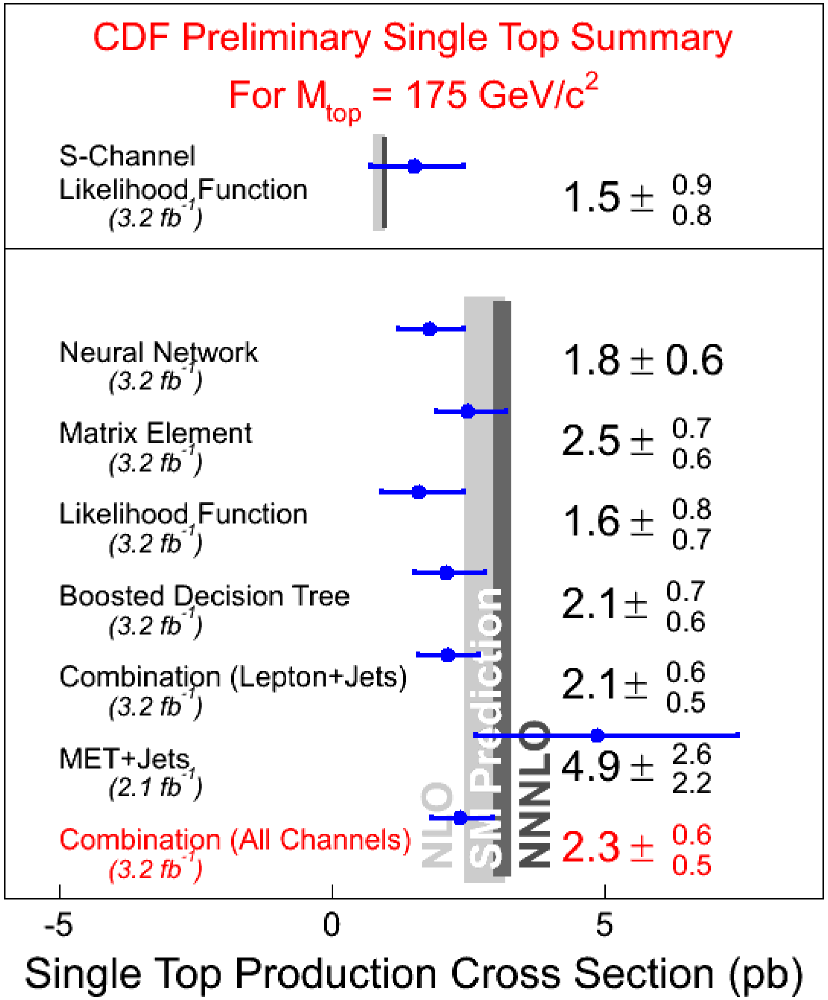
orthogonal analysis

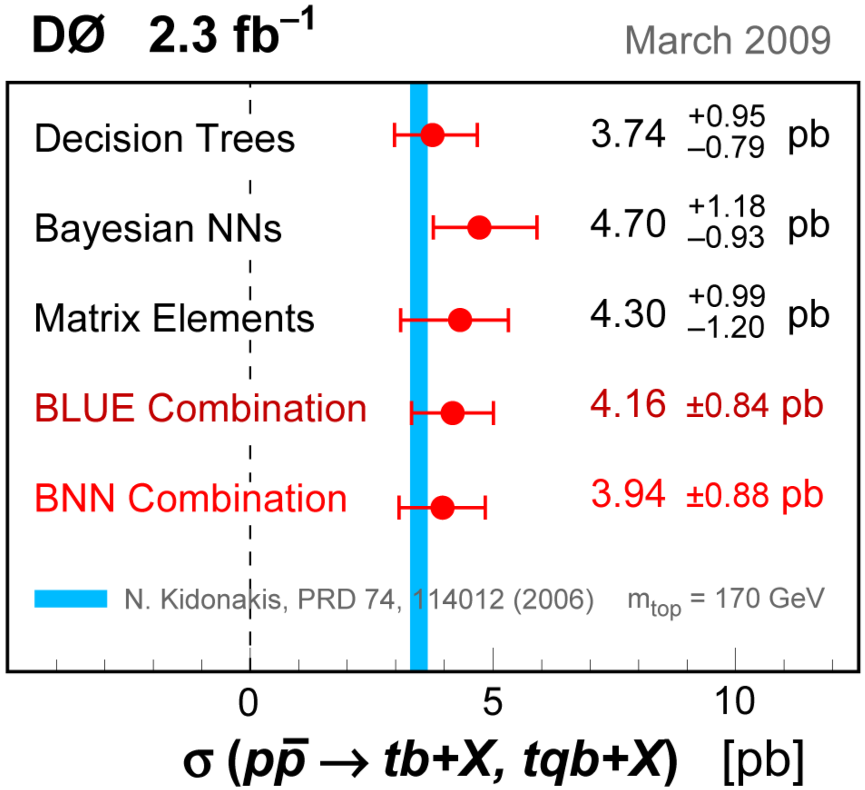






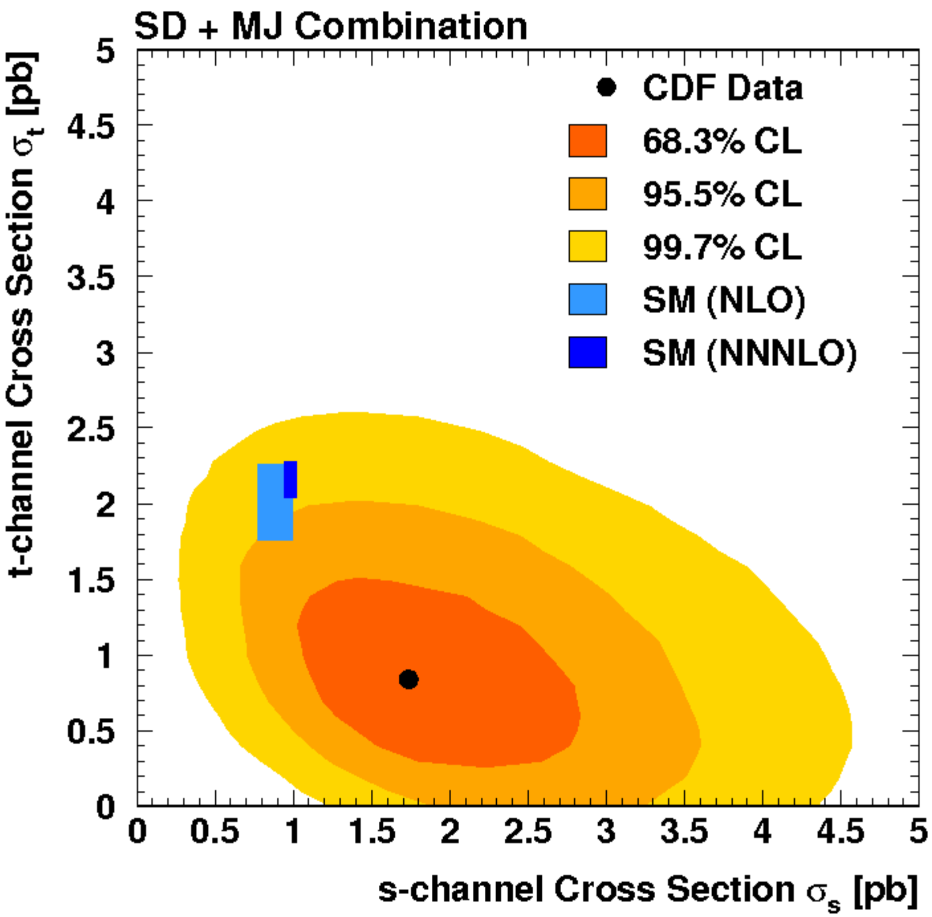
s+t-channel Results

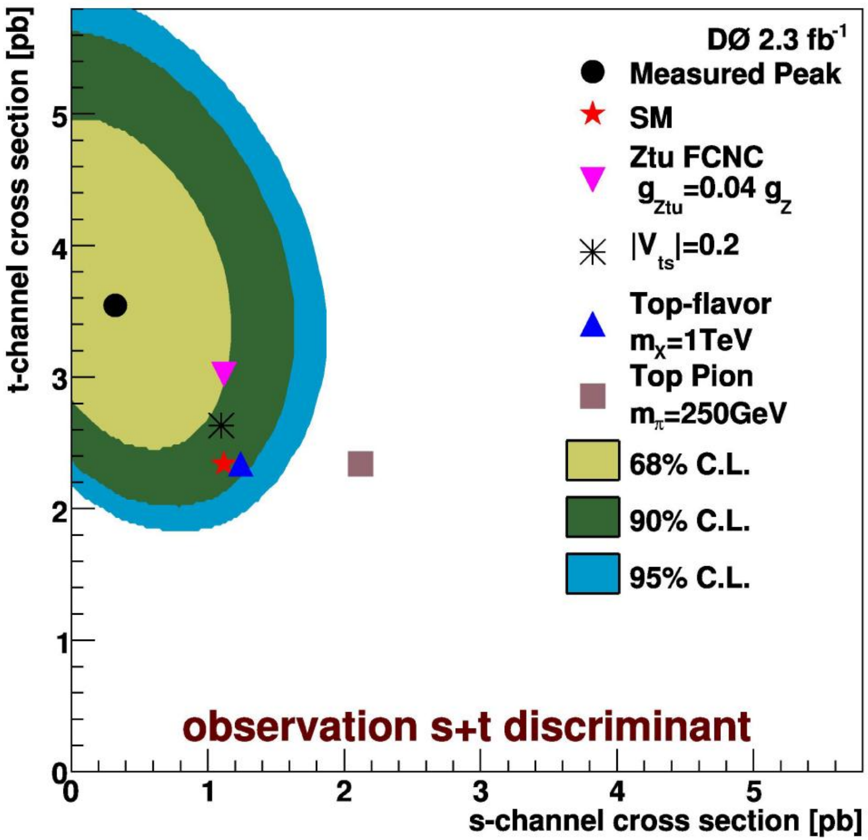




Combination result see poster

s vs. t-channel Results

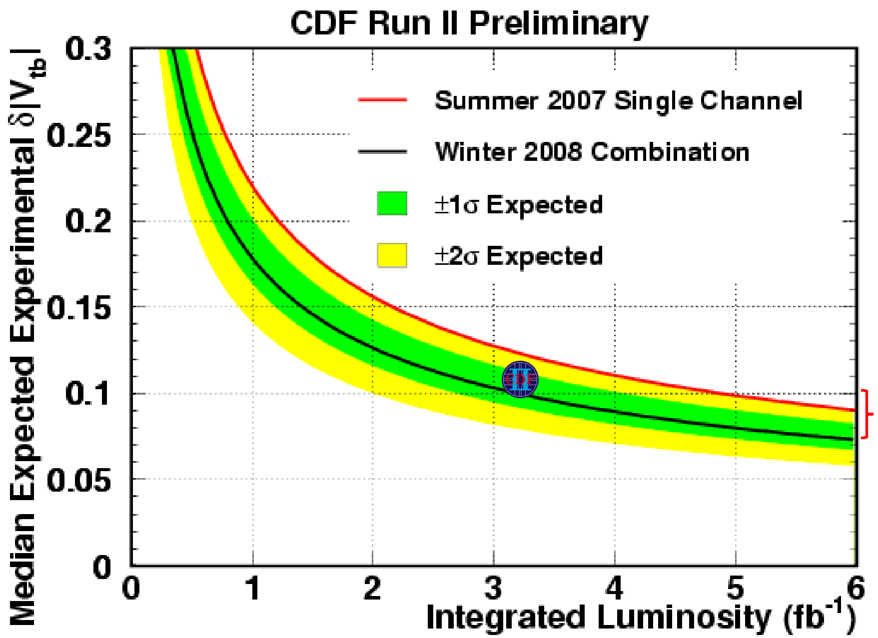




Not part of the combination

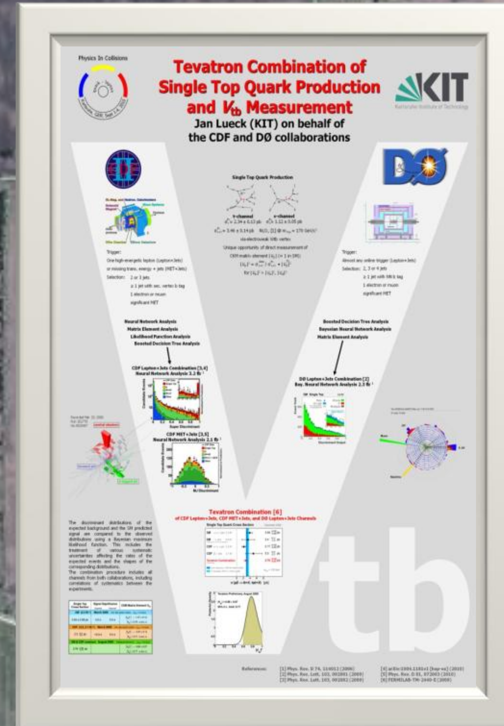
Outlook

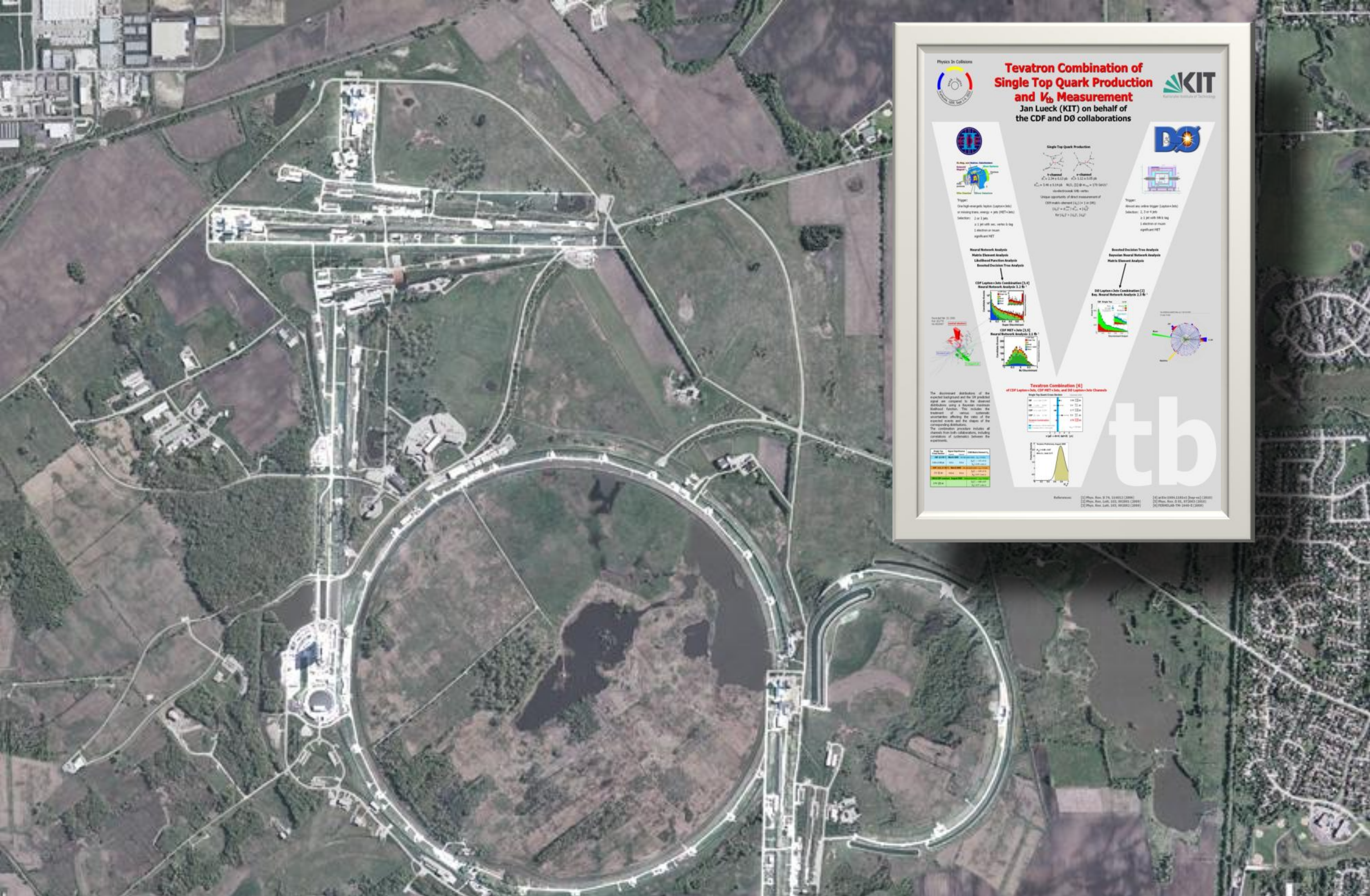
CDF and DØ will look at a ~doubled Data Set for s+t and s vs. t measurements in the coming month



~25% gain expected per experiment

You are invited to come to my poster to learn …





... why the Tevatron will remain No1 for another year