Discussion/Q&A:
Search for LIV at D0

Weirdest Referee Comment

Primary Authors:
M. Berger, T. Ferbel, H. Evans, G. Gutierrez, A. Jung, A. Kostelecky, M. Wang, D. Whittington & Z. Ye

Physics Group Conveners:
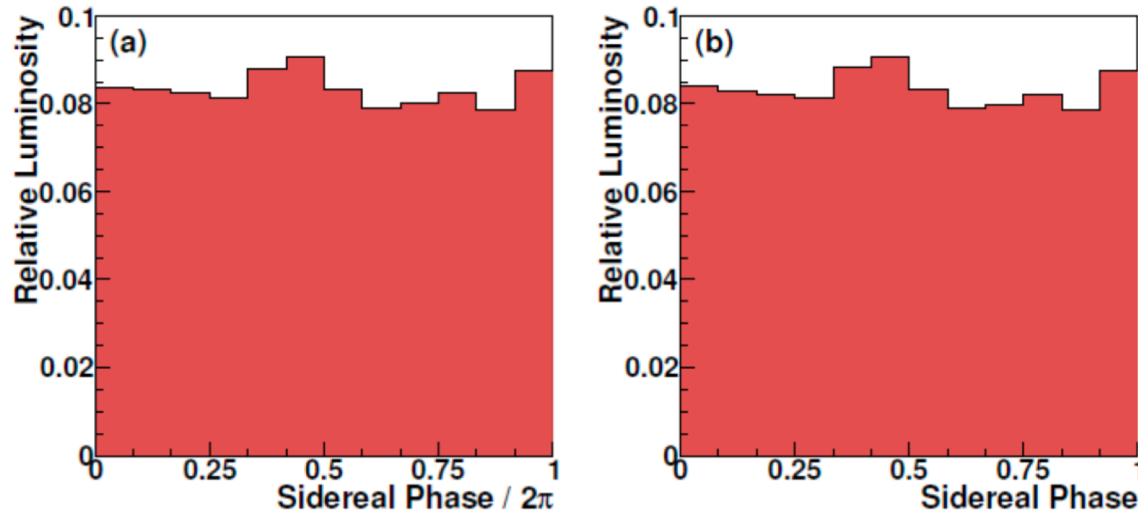Y. Peters, S. Shary & Z. Ye

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Celebrating 400 DØ Publications
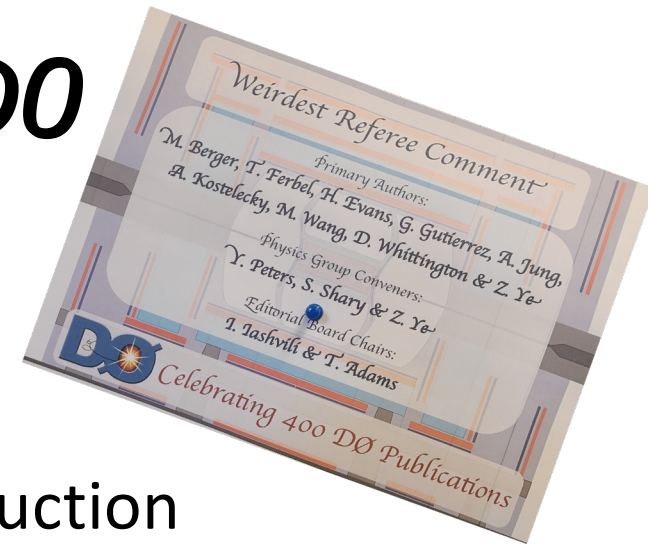
- Introduction
- Relevant Differences
- Event Selection
- Uncertainties
- Results

PURDUE
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Andreas Jung
Probing space-time properties at HEP experiments

May 29th, 2023

Additional Questions: lumi

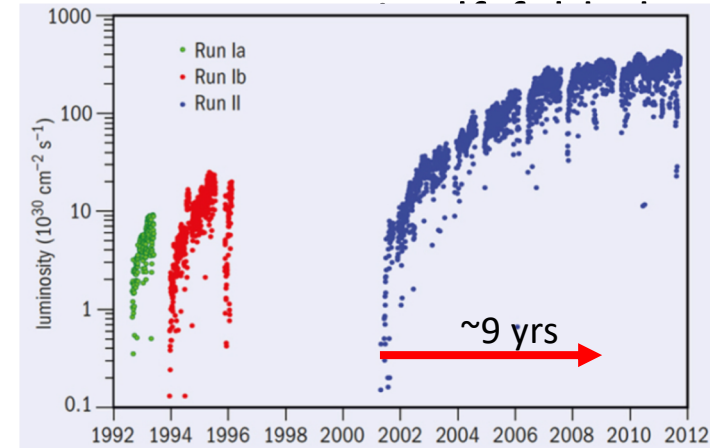→ Time-dependency of luminosity measurement into 12 bins

~9 yrs

→ Differences on the order of relative ~10%

<u>What is the time stamp and its resolution:</u>
• Beginning and end of a lumi block, resolution is ~ 1 minute, use mid-point
• Uncertainty $\pm30s$ for such a "time stamp"
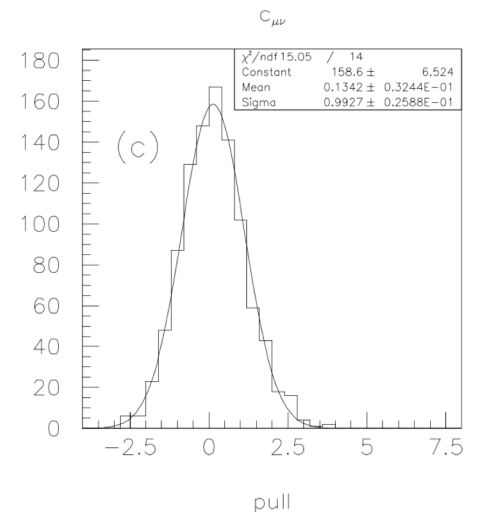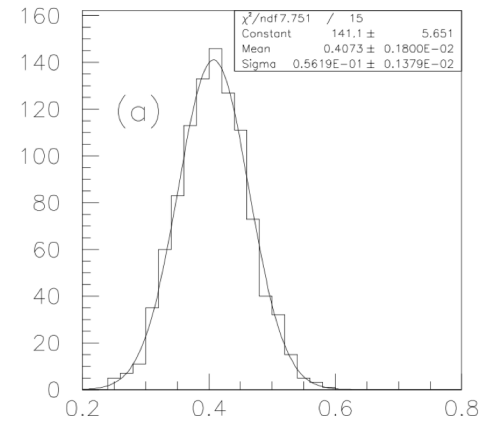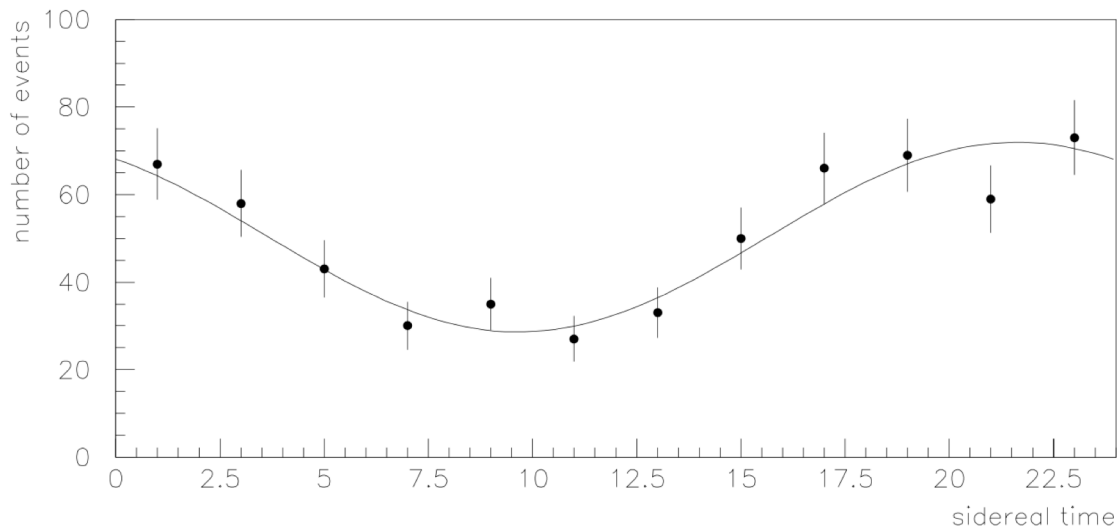• Binning choice of 12 owed to limited statistics

Additional Questions: toys

→ Toy studies use 100k events sampled into 610 signal evts (5.3/fb) for a total of 1000 toy MC sets (re-use event factor $\leq$ 1%)

→ Inject a SME signal of: $c_{\mu\nu} = (c_R)_{\mu\nu} + (c_L)_{\mu\nu} = 0.4$

→ Binned into the 12 sidereal time bins

→ Find mean of 0.41 on coefficient itself and σ of 0.99 with 0.13 ± 0.03

→ Within statistical power of toy set: method works.