

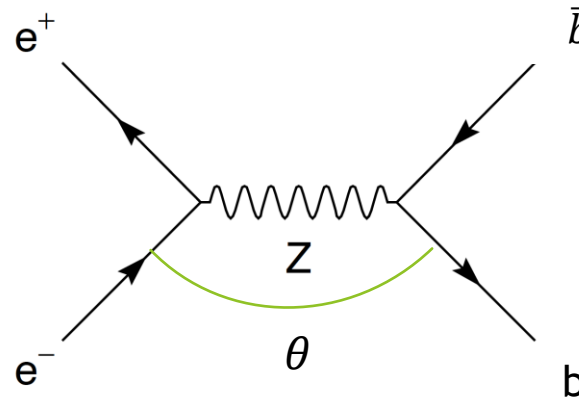
Color Reconnection in $b\bar{b}$ Forward-Backward Asymmetry

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Forward-Backward Asymmetry

- ▶ Reaction

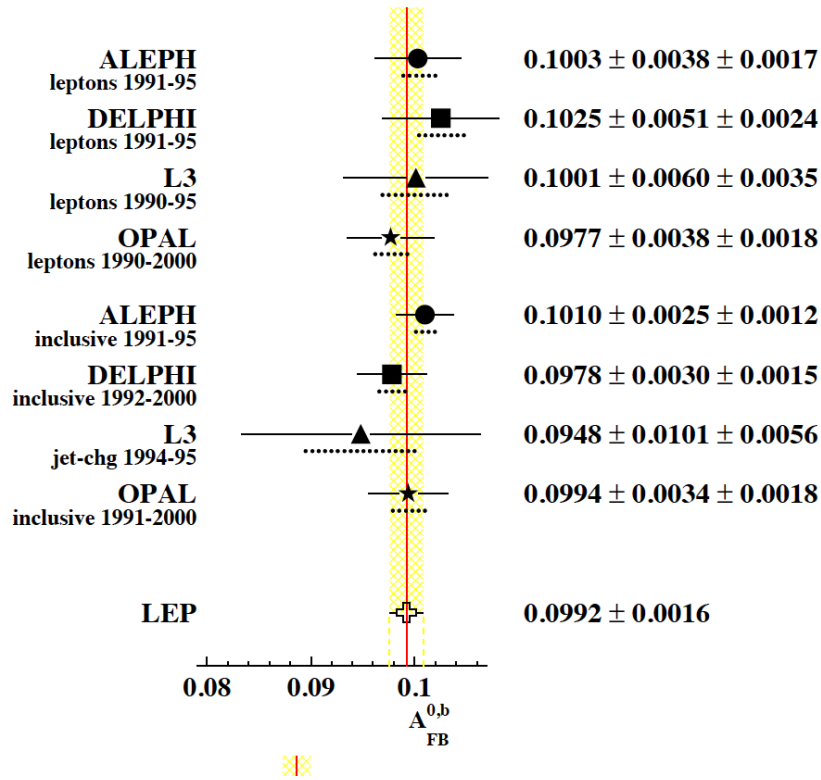
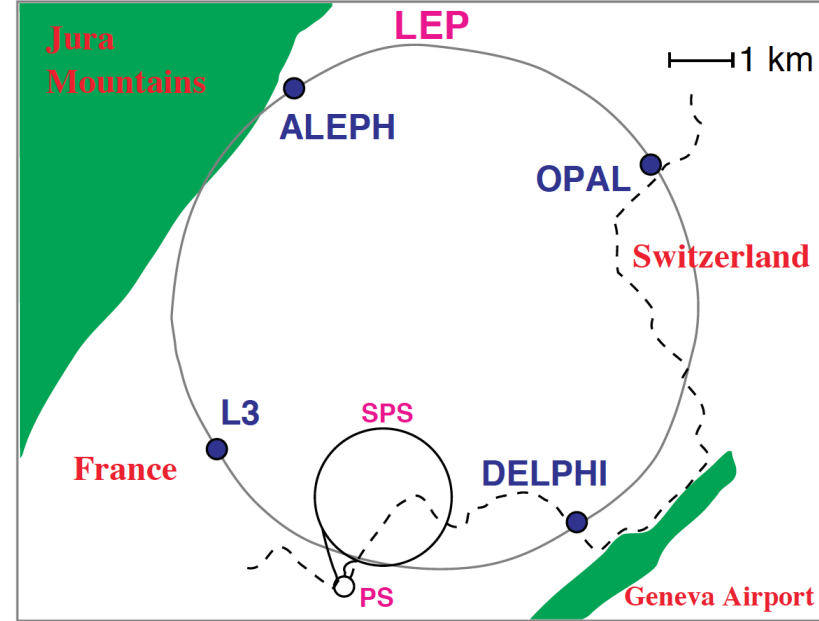


- ▶ Forward backward asymmetry

$$A_{FB} = \frac{N_F - N_B}{N_F + N_B}$$

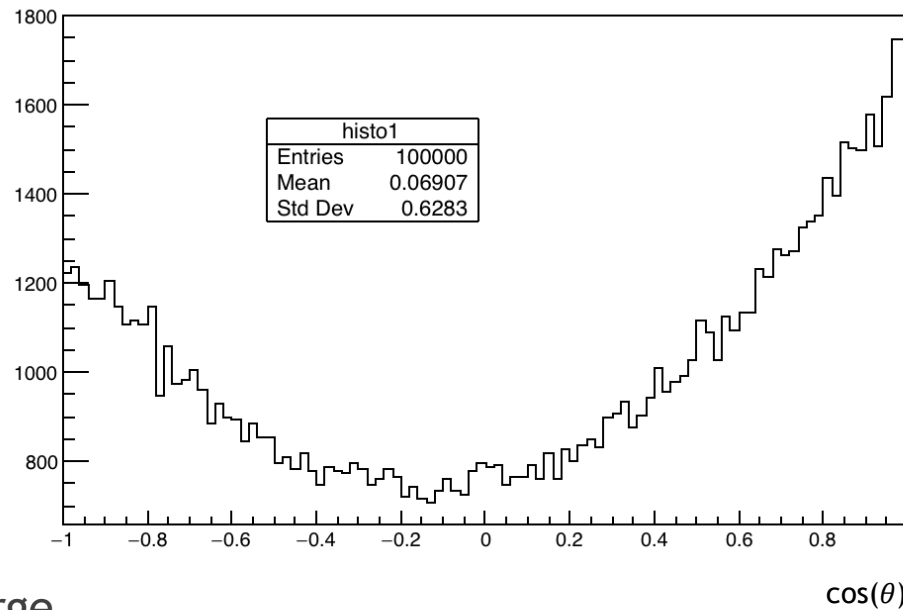
LEP Experiment

► Four Collaborations



Monte-Carlo Simulation

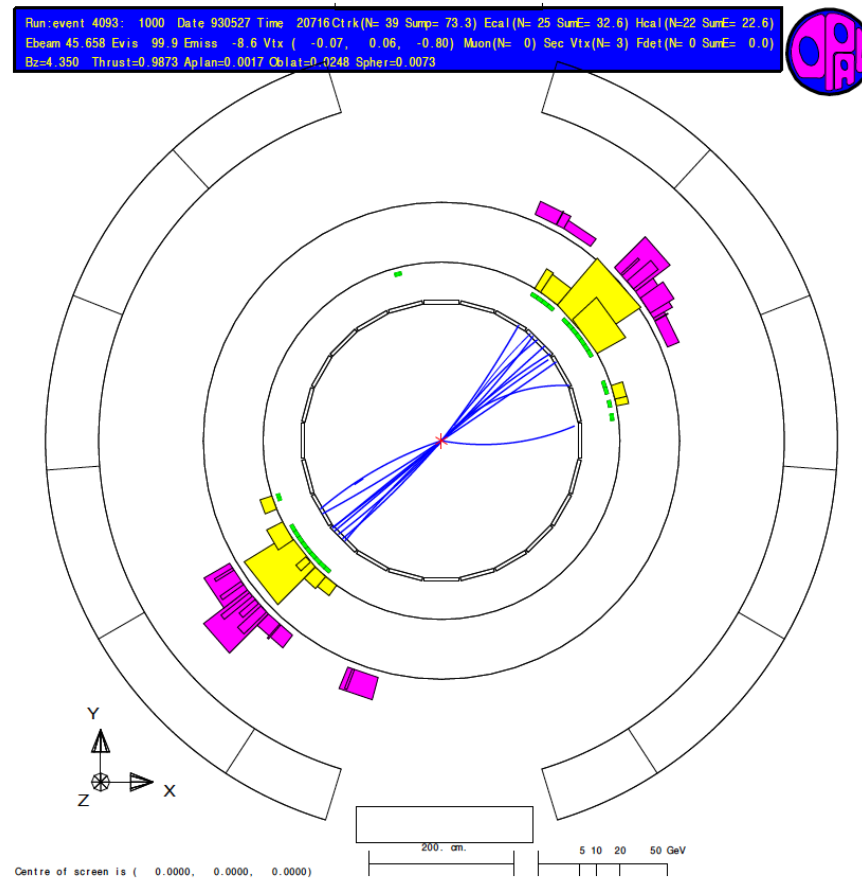
- ▶ PYTHIA8+ROOT



- ▶ Tagging quark charge
- ▶ Lepton charge
- ▶ Jet charge

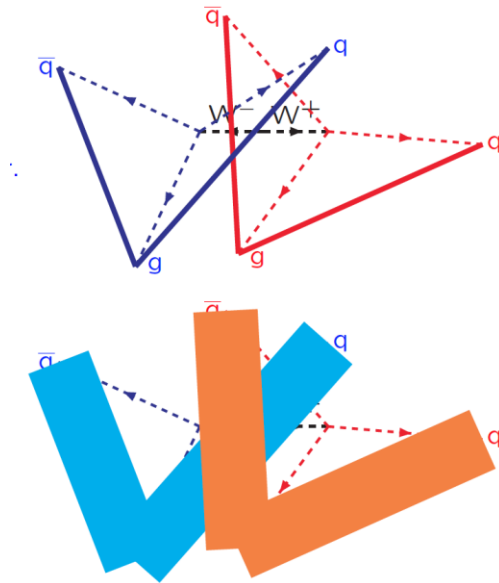
How to find the direction of the b quark?

- Use jet



Color Reconnection

- ▶ high-precision measurement of $b\bar{b}$ forward-backward asymmetries of LEP
- ▶ a 2.5σ discrepancy with respect to the SM



add color reconnection
several models

References

- ▶ Precision Electroweak Measurements on the Z Resonance <https://arxiv.org/abs/hep-ex/0509008>
- ▶ Colour Reconnections from LEP to Future Colliders: Introduction and PYTHIA models, Torbjørn Sjöstrand