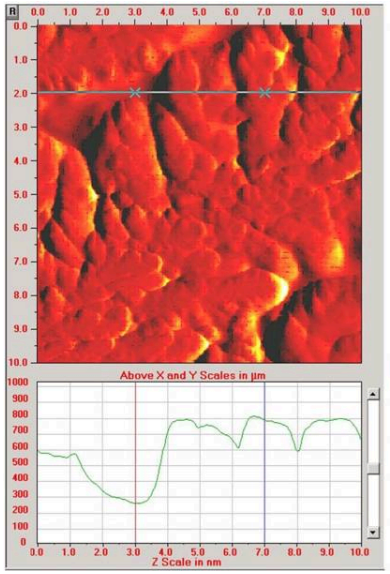
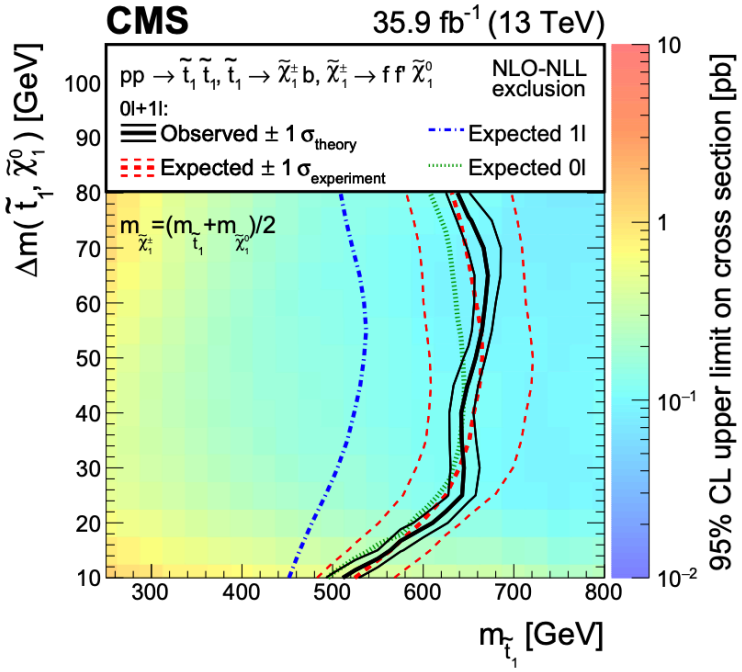
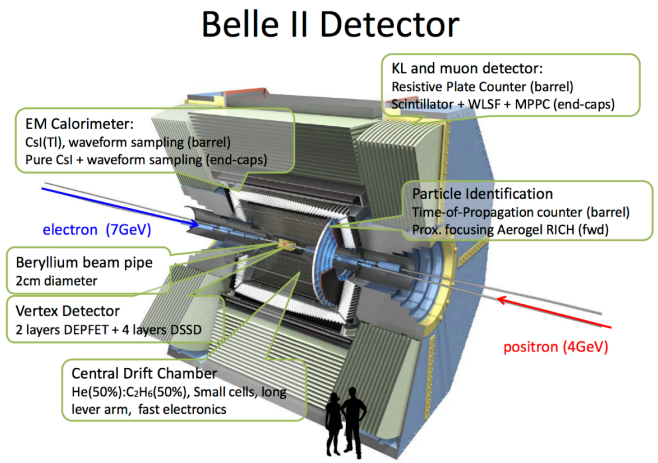
About Me: Navid K. Rad

Hi!

- BSc: Pomona, CA (Cal. Polytechnic Univ. Pomona)
  - Worked with an atomic force microscope
- MSc: Fresno, CA (Cal. State Fresno)
  - Theory work: Unruh temperature and fundamentals of QFT
  - ATLAS, improving the jet cross section calculations
- PhD: Vienna, Austria (HEPHY institute)
  - CMS Experiment, CERN
  - Search for partners of top quark in compressed SUSY models
- At DESY as a fellow (since July 2019)
  - Working with BelleII group
  - Pixel detector and tracking
  - Tau mass measurement





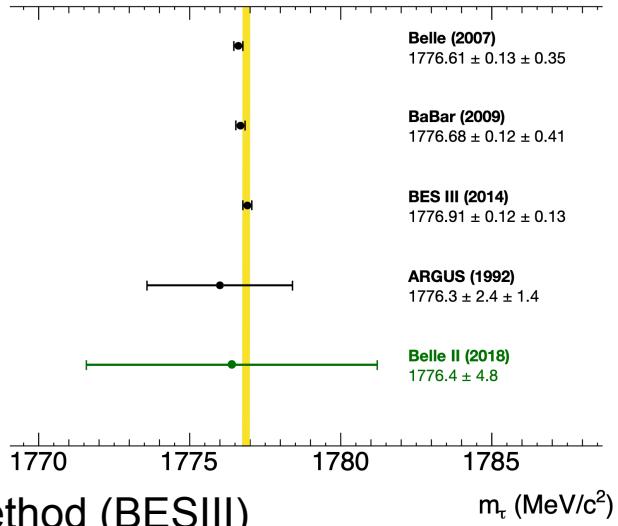


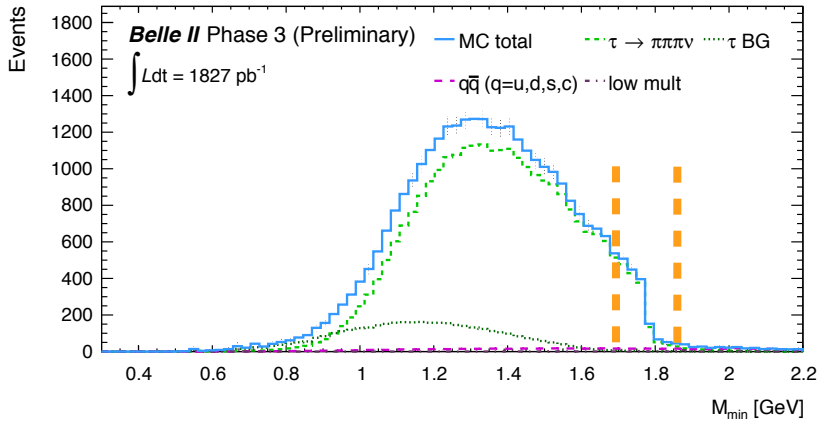
Tau Mass Measurement

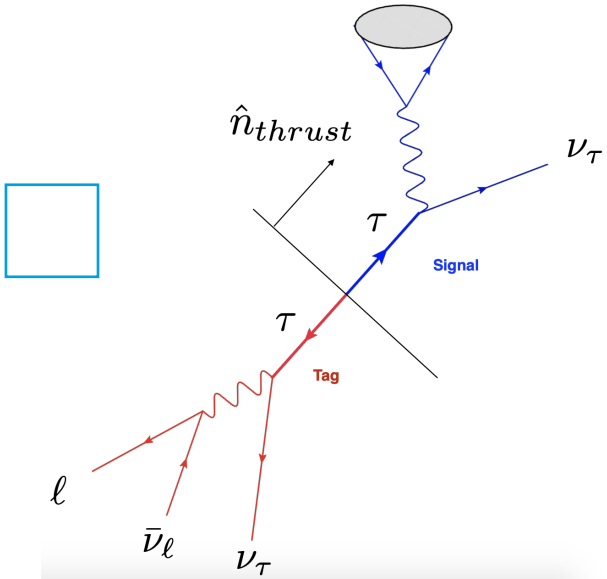
- Lepton masses are fundamental params of SM
  - Tau mass is by far the least precise one
- Tau mass measurement in Belle II (Phase 3)
  - Using a “pseudomass method”
  - Not as precise as the threshold production method (BESIII)
  - Allows for tests of CPT conservation
- Pseudomass (M_{min}):
  - Use 3x1 prong tau decays
    - Signal side: $\tau \rightarrow 3\pi$
    - Tag side: $\tau \rightarrow e, \mu, \pi$

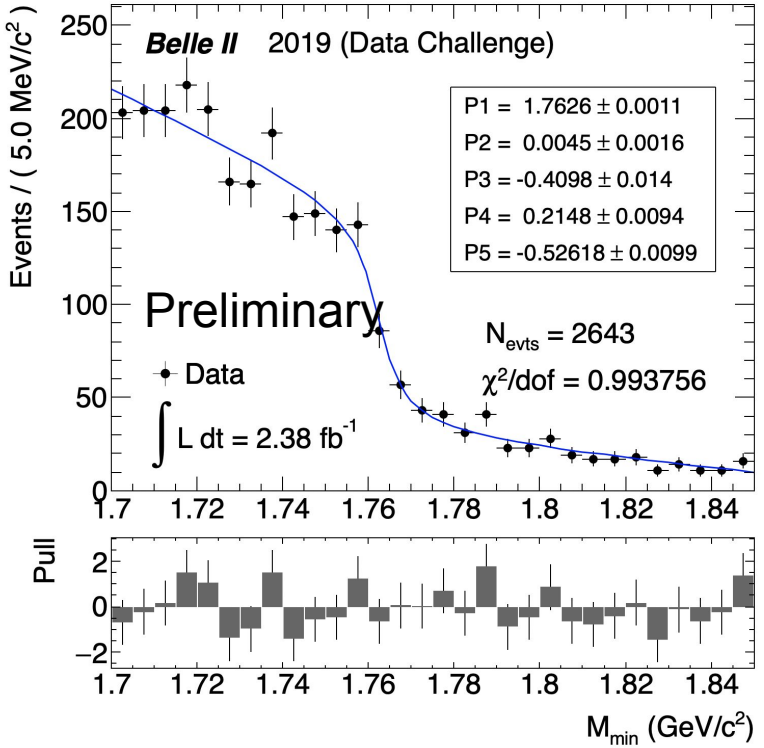
$$M_{min} = \sqrt{M_{3\pi}^2 + 2(E_{beam} - E_{3\pi})(E_{3\pi} - P_{3\pi})}$$

- Currently in the unblinding process
- Plan to have the first phase 3 results for Moriond





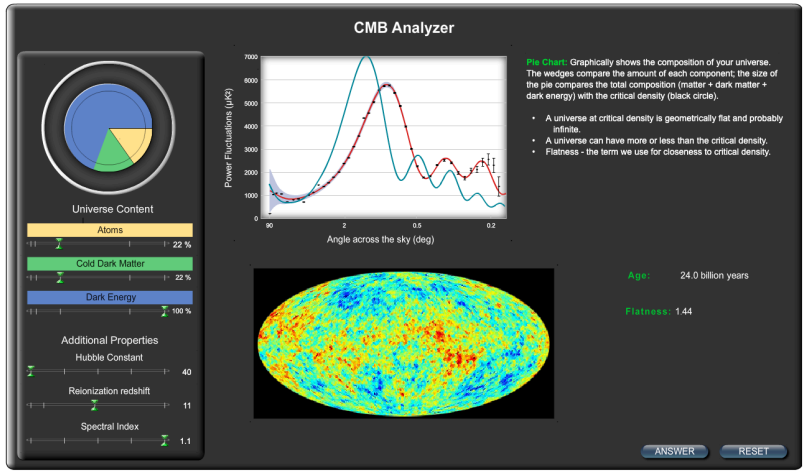




My Favourite Plot

Cosmic Microwave Background (CMB)

- Cosmic Microwave Background (CMB)
- Picture of baby universe!
- Power spectrum of CMB:
  - 6 parameter fit:
  - Density of dark energy, dark matter, baryonic matter,
  - Hubble constant, ….
- Build a universe NASA Applet



Measured by Planck collaboration: arxiv:1807.06205