$R(\Lambda_c^{+*})$ measurements

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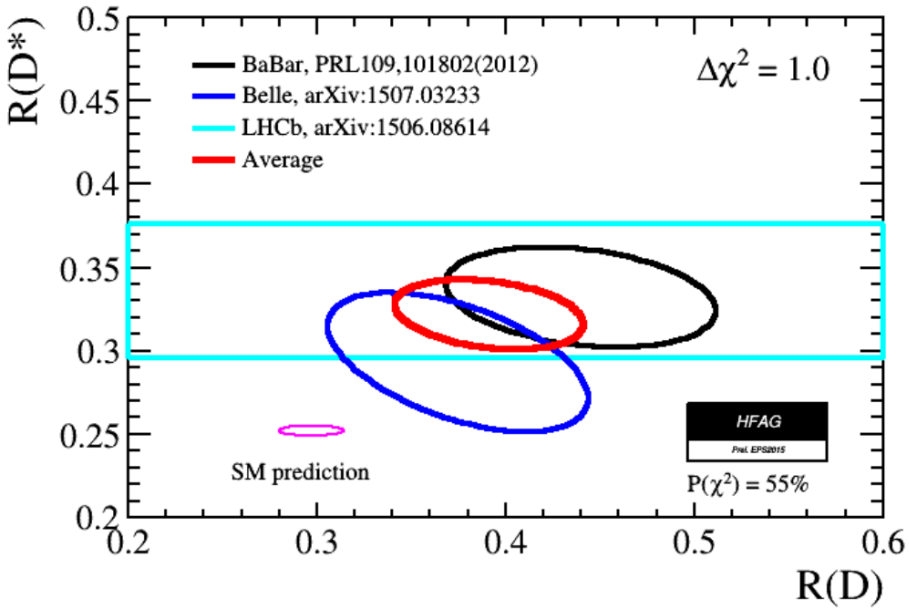
A word on recent anomalies

- $R(D^*) = \dfrac{\mathcal{B}(B \to D^* \tau \nu)}{\mathcal{B}(B \to D^* \mu \nu)}$
- Clean SM prediction: $R(D^*) = 0.252(3)$, PRD 85 094025 (2012)
- LHCb result: $R(D^*) = 0.336 \pm 0.027 \pm 0.030$, HFAG average: $R(D^*) = 0.322 \pm 0.022$
- $3.9\ \sigma$ discrepancy wrt. SM.

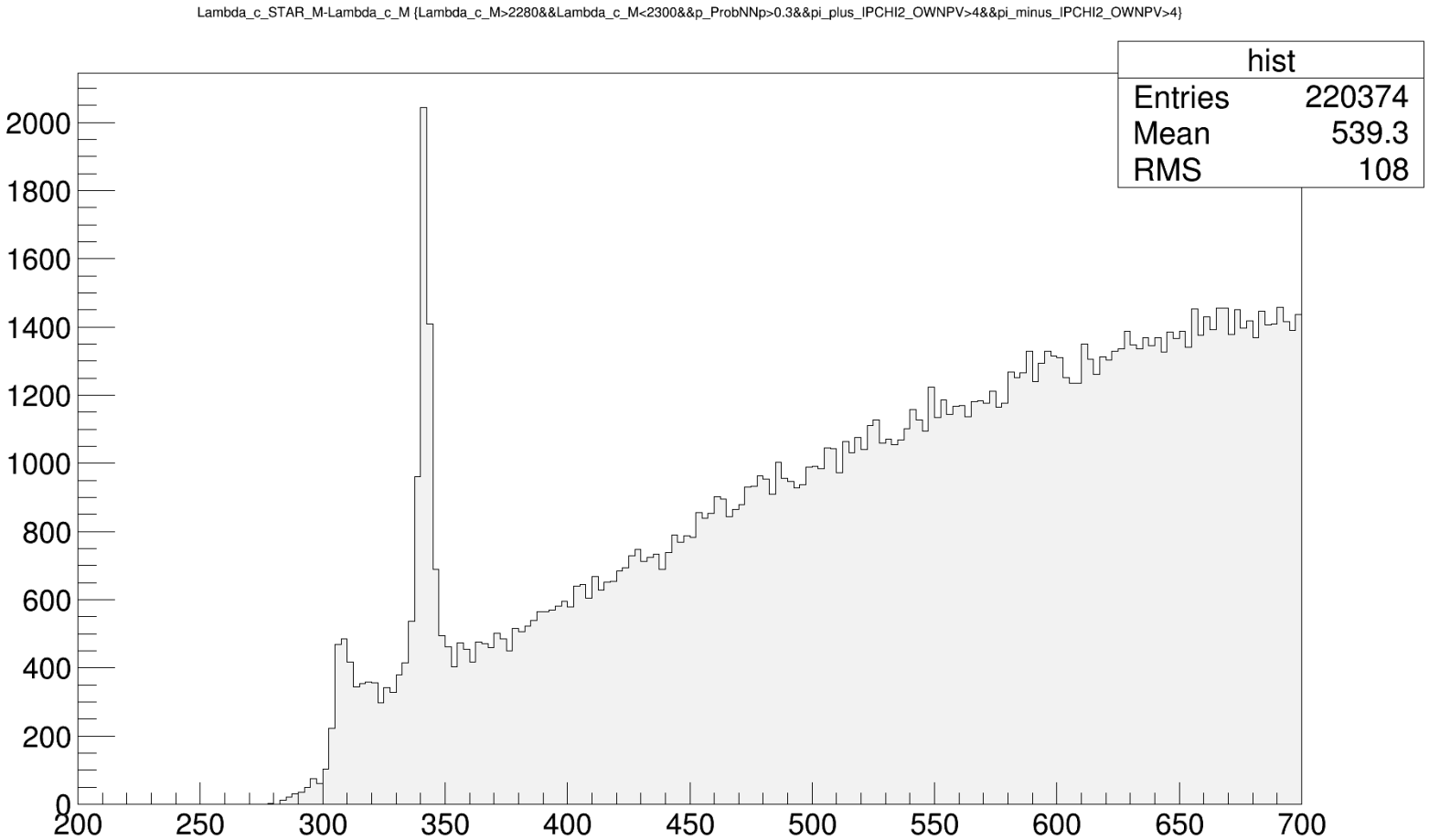


The idea

- The idea is to measure the same quantity but for baryons.
- With Danny we are working on SM prediction of $R(\Lambda_c^{+*})$.
- btw. There are 2 interesting Λ_c^{+*}: $\Lambda_c^{+*}(2595)$ and $\Lambda_c^{+*}(2625)$.
- Both go into $\Lambda_c^+\pi\pi$ state.
- They are both a part of the same doublet aka both are described by Rarita-Swinger spinor.
- Additional measurements: $\mathcal{B}(\Lambda_b \to \Lambda_c^{+ast}\ell\nu$ have a experimental measurement.
- Ration of the two states gives info about QCD parameter that for now has large error.

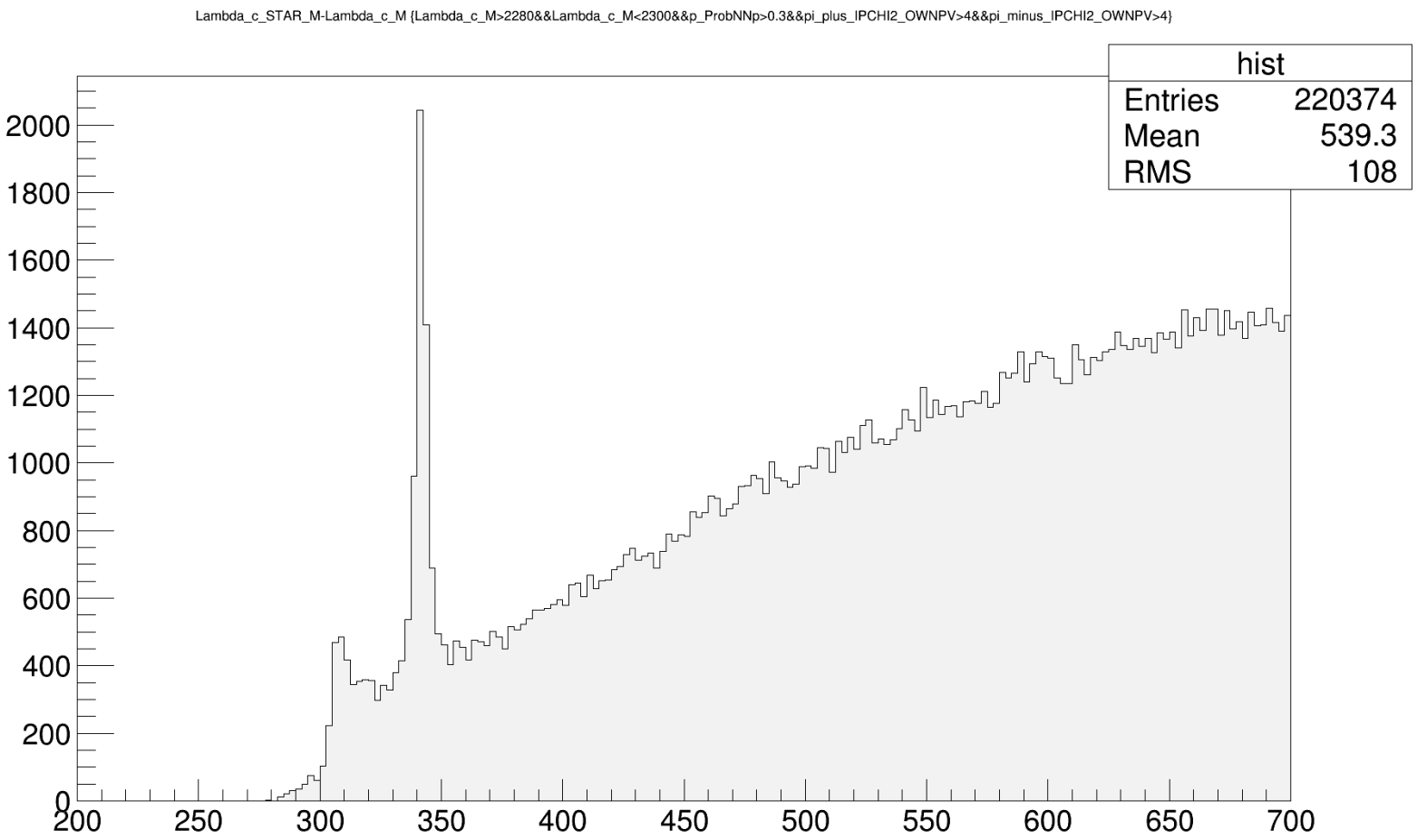
The good

- For the muon mode there exist a $\Lambda_b \to \Lambda_c^+ \mu\nu$ stripping line. So processes(2011 done, 2012 on the grid).



The bad

- There is no stripping for the tau mode.
- I am running fast to meet the deadline.
- Would be great to have both hadronic tau decay and muonic.



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