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Combined fit of the energy spectrum and mass composition across the ankle with the data measured at the Pierre Auger Observatory

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What is this contribution about?

The energy spectrum and the mass composition data measured at the Auger Observatory in the energy region across the ankle are used to infer **information about the fluxes and nature of primary particles escaping from the extragalactic sources.**

Why is it relevant/interesting?

It is a low-energy extension of the above-ankle fit results ([JCAP04\(2017\)038](#)), where we constrain the characteristics of a simple astrophysical model in the attempt to interpret the change of slope at $\sim 5 \cdot 10^{18}$ eV and the region just below it.

What has been done?

We performed a combined fit by considering the simple case of a **superposition of different contributions, extragalactic (EG) and/or Galactic.**

What is the result?

- Our data can be reasonably described by the **superposition of two EG components, a very soft one** dominating the region below the ankle and **a very hard one**, taking over above the ankle and affected by the rigidity cutoff at the sources.
- The results are prone to the systematic uncertainties, especially the experimental ones; however, testing different source evolution scenarios, we conclude that our fit **disfavours a strong positive evolution for the high-energy component.**

