

# Evidence for a break in the Elongation Rate of Shower Maximum at $\sim 3$ EeV from four independent studies

*Monday, 3 October 2022 15:50 (20 minutes)*

During UHECR2018, it was pointed out that data from Fly's Eye, HiRes and the Telescope Array were suggestive of a break in the Elongation Rate above  $\sim 3$  EeV. Sokolsky and D'Avignon (2021) have recently rediscovered this observation. Additionally, they assert that cosmic rays arriving from the Northern Hemisphere have a different mass composition from those arriving from the Southern Hemisphere. Data from four independent measurements of the Elongation Rate will be reviewed. It will be shown that there is strong evidence for a break in the Elongation Rate above  $\sim 3$  EeV in each data set, so adding support to the long-held conclusion of the Auger Collaboration that the mean mass of cosmic rays increases with energy above  $\sim 3$  EeV. However, the claim by Sokolsky and D'Avignon of a mass difference between cosmic rays arriving from the two hemispheres is not upheld. This talk is offered as, in the view of the joint TA/Auger Mass Working Group, it may help 'spice up the discussions' on mass composition at this meeting.

**Primary author:** Prof. WATSON, Alan (University of Leeds, UK)

**Presenter:** Prof. WATSON, Alan (University of Leeds, UK)