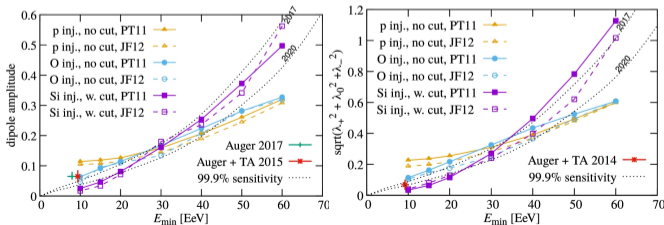


# How isotropic can the UHECR flux be?

Based on AdM and P. Tinyakov, *MNRAS* **476** (2018) 715 [[1706.02534](#)]

- Most  $|\mathbf{d}|$  and a sizeable fraction of  $|\mathbf{Q}|$  expected to survive magnetic deflections!
- Simulations with extreme assumptions, to ensure predictions are lower bounds:
  - No UHECR sources within 5 Mpc
  - UHECR sources in all galaxies further away
  - Three composition scenarios, spanning all realistic possibilities and a bit more:
    - Pure protons
    - Pure silicon
    - Oxygen plus secondary protons
  - Two rather different models of regular deflections, resulting in similar predictions
    - Pshirkov *et al.*, *ApJ* **738** (2011) 192
    - Jansson & Farrar, *ApJ* **757** (2012) 14
  - Upper bound to turbulent deflections from Pshirkov *et al.*, *MNRAS* **436** (2013) 2326



**Likely mixed composit. @ 10 EeV!**  
(dipole would be stronger if light, weaker if heavy)

(“2020” predictions overly optimistic — assumed  $\text{TA} \times 4$  would start right away and no calibration uncertainty)