

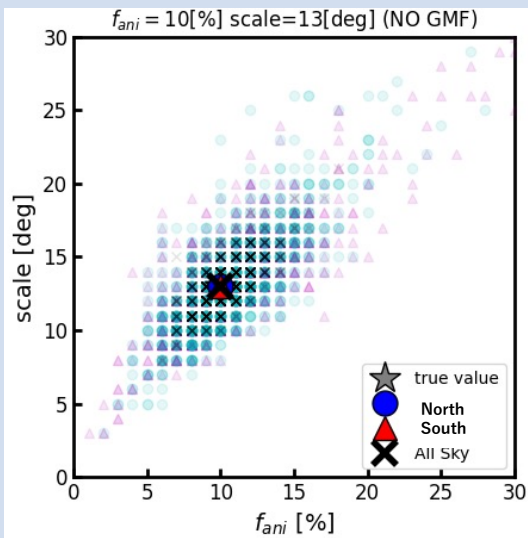
# Effects of galactic magnetic field on the UHECR anisotropy studies

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Model CR flux pattern(original)  $F_{\text{org}}$

Model CR flux pattern(on the earth)  $F_{\text{earth}}$

**UHECRs events  
(w/o coherent  
deflection by GMF)**



- Correlation between
  - events(w/o GMF)
  - flux (w/o GMF)
- When we do not consider the coherent deflection by GMF, estimated parameters are centered at input value in any datasets.

**A**

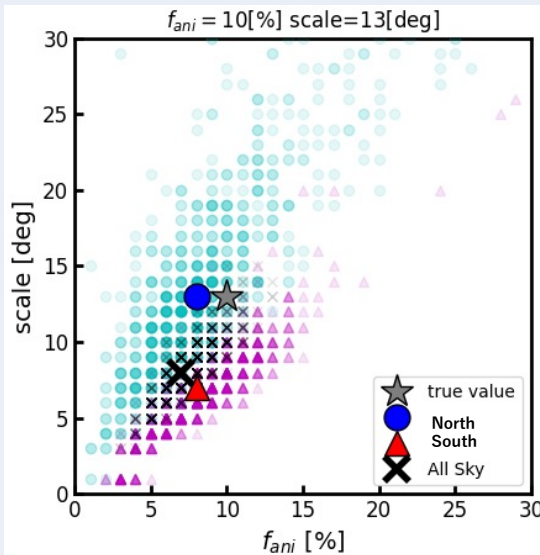
**Questions:**

- How much bias in the parameter estimation w/ and w/o GMF, North and South?
- Can we reduce the bias by considering GMF effect in the analysis?

=> To investigate the GMF effect, we conduct likelihood analysis with mock events & model flux for these patterns:

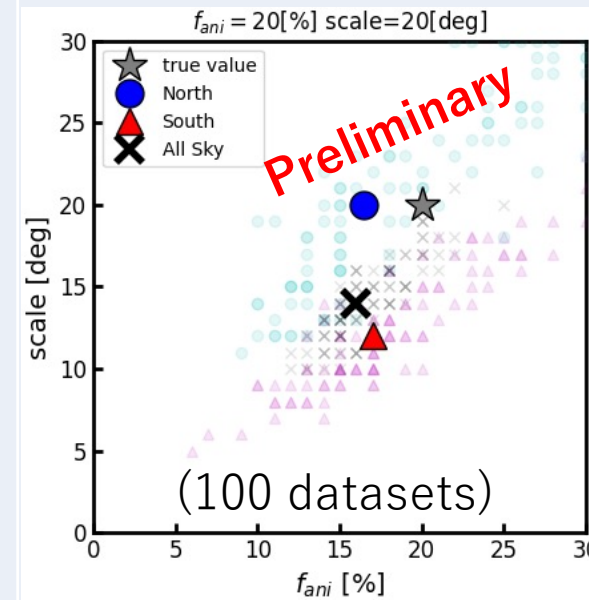
- events w/o GMF & flux w/o GMF
- events w/ GMF & flux w/o GMF
- events w/ GMF & flux w/ GMF

**UHECRs events  
(w/ coherent  
deflection by GMF)**



- Correlation between
  - events(w/ GMF)
  - flux (w/o GMF)
- When we consider the GMF effect only for the events, there would be systematic decrease of estimated parameters in south-sky & all-sky datasets.

**B**



- Correlation between
  - events(w/ GMF)
  - flux (w/ GMF)
- When we consider the GMF effect for both events & flux, we may reduce the systematic decrease of anisotropic fraction due to GMF.

**C**