

Executive Summary

- We implemented the **random phase approximation (RPA) calculations** in **density functional theory (DFT)** (T. Inakura *et al.*) in CRPropa and simulated propagation of ultrahigh energy cosmic ray nuclei.
- We found that the difference between the RPA calculations and the default settings of CRPropa in the spectral shape is much larger than the statistical uncertainty of the experimental data when the same astrophysical parameters are assumed. The model predictions of photonuclear reactions will be experimentally tested by the **PANDORA** project in the near future.