

## **Metadata examples for isotopic data in cosmo- and geochemistry data repositories**

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Journals and funding agencies demand increasingly data and their metadata to be FAIR and open to foster interoperability and reuse of data for new projects in science. In the future, research data will be accessible through data repositories which follow these principles. A major requirement will be the application of appropriate metadata standards, which also need to reflect current analytical developments. For instance, the last two decades have seen proliferation of high-precision isotopic ratio measurements in geo- and cosmochemistry. This includes mass-dependent and mass-independent isotopic variations that can be applied to a range of geological problems (e.g.,  $\delta^{66}\text{Zn}$ ,  $\delta^{44}\text{Ca}$ ,  $\epsilon^{182}\text{W}$ ,  $\mu^{142}\text{Nd}$ ,  $\epsilon^{54}\text{Cr}$ ,...). Resolution of differences of isotopic ratios at levels of 10 ppm or better requires extensive documentation of the analytical methods for the assessment of data quality. Metadata must reflect these reporting standards, which can be more elaborate than, for instance, procedures commonly applied to radiogenic isotope ratios (e.g., <https://doi.org/10.1594/IEDA/100426>).

We will illustrate this using the example of mass-independent isotope ratio data applied in cosmochemical research of the DFG-funded collaborative research center 'Late Accretion onto Terrestrial Planets' (TRR 170). Research data and metadata generated by members of TRR 170 are stored in the TRR170-DB data repository (<https://planetary-data-portal.org/>). The TRR170-DB has a flexible metadata system that uses tailored "metadata blocks" for specific data communities. The metadata blocks are based on standards that are compliant with several international metadata schemata (i.e., DDI, DataCite, Dublin Core, VOResource Schema, etc.) and controlled vocabularies. Once a dataset has been published, its metadata and files can be exported in various other metadata standards and file formats. We are currently extending metadata fields to allow for a comprehensive description of isotopic data from the analysis of meteorites and other geological samples. Examples will be shown at the meeting.