Query string-controlled web service for sharable and reproducible data visualization of earth, planetary and space sciences

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We propose a new method for sharable and reproducible data visualization on a web browser. Reproducibility is one of the foundations of the scientific method. Reproducible evidence is imperative to build new scientific knowledge. Most natural scientists use figures, graphs, plots or diagrams to understand a phenomenon in detail. Therefore, information and communication technology for reproducible charts needs to promote scientific development. However, it is not easy especially for studies dealing with scientific data of different fields, because each data set is usually stored in a different place and a different format. For this reason, we have been building a web service, Cross-Cutting Comparisons (C3; Imai et al., 2018; doi/10.20637/JAXA-RR-17-009/0001; https://www.darts.isas.jaxa.jp/C3/).
One of the features of C3 is the interactive interface. By the inductive entry form, it is easy to make flexible charts of earth, planetary and space sciences on a web browser. C3 also has a query string (QS)-controllable system which includes information of data handling procedures in the QS in an orderly manner as follow:

(URL of CGI program)?(header)+(data selection)+(data extraction)+(option).

The QS consists of four parts separated by plusses (+): header, data selection, data extraction, and option. The information of data set and figure type is described in the data selection part. The information of data extraction is in the data extraction part. By explicitly showing the inputted setting in an orderly manner in the URL, it is easy to understand how the charts are made. User can make the charts by directly enter the QS in an address bar and also share the QS with text-based communication tools.

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