Relational database construction for Table of Aerosol Optics

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This effort is dedicated to construction of a relational database and an interactive web system that organizes and communicates aerosol optical and microphysical characteristics assembled in the Table of Aerosol Optics (TAO) community repository. The TAO project (https://science.larc.nasa.gov/mira-wg/topics/tao/) is an extension of historical efforts (e.g., Shettle and Fenn, 1979; d'Almeida et al., 1991; Koepke et al., 1997; Hess et al., 1998) on providing libraries of aerosol characteristics for applications in global chemical transport modeling and remote sensing. Aerosol characteristics such as size distribution, complex refractive index, shape, mixing state, extinction, absorption, single-scatter albedo, lidar ratio, etc. are provided for different aerosol types, wavelengths, be originated from laboratory measurements, in situ or remote sensing observations. Combination of aerosol characteristics, their origins, types, spectral domains, computational techniques used for single-scatter properties become quickly very complex and is expected to evolve in future. The open access and interactive principles of TAO implies increasing complexity of its database structure that requires involvement of dedicated computer science technics for its organization and management. The relational database conception, for instance, is widely used in many domains that require such data organization and naturally appropriates to TAO. The relational database consists in structuring the data in multiple tables, with so-called primary or foreign keys that relates between entity types, parameters and their value in unique or multiple connections. We therefore started development of tools for uploading of the TAO data into the format of relational database and creation of a web interface for an interactive communication with the community. This work is expected to be presented as complimentary to a more general presentation about the TAO as part of MIRA by G. L. Schuster and gather valuable feedbacks from modelers, in situ and remote sensing experts on the data needs, convenient exchange formats and potential applications.

Preferred mode of presentation: Poster