OpenSSP Portal Grand Reopening: A Milestone Towards NASA PaSS DB

Kwo-Sen Kuo (kkuo@umd.edu), Bruce Altner, Dai Hai Ton, Robert Schrom, Ian Adams, George Huffman, Scott Braun

OpenSSP, standing for Open Single-Scattering Properties, is first a database of numerically grown, realistic solid hydrometeors and their (scalar) single scattering properties, and secondly a web interface (portal) to the database for interested researchers to obtain particle structure(s) and their corresponding SSPs.

We started the OpenSSP web interface around 2016. It was programmed in JavaScript (JS) and hosted by NASA's Precipitation Processing System (PPS). However, the original developer left in 2018, and the JS-based web interface began to fall out of date. By 2023, some of the most useful functions of the portal became unreliable, for example, getting SSPs for an ensemble of particles specified by a particle size distribution (PSD) and/or a mass-dimensional (m-D) relation.

The Global Precipitation Mission (GPM) and the Atmospheric Observing System (AOS) projects provided in 2023 support for the renewal of OpenSSP as the first step toward a much richer NASA Particle and Single-Scattering Database, PaSS DB, which will feature an augmented non-liquid hydrometeor collection, including melting hydrometeors and additional solid hydrometeors, with polarimetric SSPs for multiple particle orientations. We also envision a mechanism for NASA PaSS to accept community contributions to the database and to include other non-spherical particle species, such as aerosol, dust, or salt particles.

OpenSSP is now back in operation at a different URL, https://ParticleScattering.org. (The original URL, https://storm.pps.eosdis.nasa.gov/storm/OpenSSP.jsp, is now defunct.) The following are some notable changes. OpenSSP used to use an HDF file as a convenient substitute for a database management system (DBMS); it now employs a bona fide relational DBMS, PostgreSQL, to offer better performance in anticipation of the vastly increased data volume of NASA PaSS DB. We have also tweaked the graphical interface to make OpenSSP more intuitive and usable.