

Evolution of the Equation of State Production Code OpenSesame

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OpenSesame is the next-generation code for production and management of equation of state (EOS) libraries that has been under development in T-1 for the last few years. This code incorporates the capabilities of its predecessor, GRIZZLY, which has been used with great success in producing EOS for the SESAME database, and it can also calculate and plot information using existing EOS. The code is based on a modular Fortran90 structure that should be easily extensible and maintainable. In the last year we have taken substantial steps toward the release of a reliable and stable Version 1.0.

For users, the most visible code management change is the switch to an updated OpenSesame webpage that can be found at <https://keiki.lanl.gov/opensesame/>. We will periodically release official versions of the code, which can be downloaded from this webpage. We have also simplified the OpenSesame build process by using the standard GNU autoconf/automake process. We support a variety of platform/compiler combinations and intend to add more as the need arises. This year we will implement and release a new graphical user interface (GUI), replacing the old Tcl/Tk-based GUI. The new OpenSesame GUI will be written in Java, making it platform-independent. This choice of language also enables us to release precompiled byte-code, which will make the installation process for users of OpenSesame much simpler.

We have also moved the source code to a subversion server, which will allow users to choose their level of involvement in the code development process. At the

simplest level, users can download the official stable source code from our webpage. At the next level, users with read access to the subversion server can check out the most recent revision directly. Finally, users who want to participate in the code development process can get write access to the subversion server and submit their own changes to the OpenSesame code. In conjunction with the subversion server, we have implemented a ticketing system (trac) that helps organize code development. It can be found at <https://keiki.lanl.gov/cgi-bin/trac.cgi>.

The ticketing system serves three purposes: 1) it allows users to report issues they find when running OpenSesame and track the progress on their resolution; 2) it allows for a more precise organization and handling of quality control issues; and 3) it allows for the explicit use of "milestones," which define well-focused goals, can be easily tracked by users, and enhances the quality and efficiency of our development efforts.

As an additional step toward quality assurance, we will set up a build farm that will automatically build and verify the most recent revision of the OpenSesame source code. This allows us to quickly and reproducibly identify code regressions. An extensive suite of test inputs to OpenSesame has already been developed to verify the code's functions; we will expand this suite to cover all major functions and incorporate checking against the suite into the build farm.

We hope that these steps will enhance the quality and productivity of Open-Sesame by allowing quicker and more efficient code development and distribution.

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Funding Acknowledgements

NNSA's Advanced Simulation and Computing (ASC), Materials and Physics Program.