SAC Availability for the IRIS Community

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SAC (also known as SAC2000) is a signal processing and analysis code that has been developed by Lawrence Livermore National Laboratory (LLNL) over the past 20+ years for a variety of seismic and geophysical research projects. SAC has evolved into a general purpose interactive program designed for the study of sequential signals, especially time-series data. Emphasis has been placed on analysis tools used by research seismologists in the detailed study of seismic events. Analysis capabilities include general arithmetic operations, Fourier transforms, three spectral estimation techniques, IIR and FIR filtering, signal stacking, decimation, interpolation, correlation, and seismic phase picking. SAC also contains an extensive graphics capability.

SAC is used extensively by the seismic community because: 1) it has a broad range of well-tested, efficient data analysis capabilities (examples include: data inspection, phase picking, signal correction, quality control, unary and binary data operations, traveltime analysis, spectral analysis including high-resolution spectral estimation, spectrograms and binary sonograms, and array and three-component analysis); 2) it is easy to use and reliable; 3) it has a macro programming language that allows users to develop innovative new analysis techniques; 4) it has interfaces to the Unix operating system, Matlab <www.mathworks.com>, and the Generic Mapping Tools (GMT) software <http://gmt.soest.hawaii.edu/> that make it very flexible, allowing researchers to solve many research problems innovatively with minimal programming effort; and 5) the suite of analysis capabilities are integrated so that innovative processing schemes are easily implemented. SAC is also widely used because of its user-oriented development philosophy, which has led to consistent, easy to use capabilities that are backward compatible.

IRIS and LLNL have recently signed a contract to provide IRIS with a license for SAC that would allow the sharing of the SAC/SAC2000 source code with the IRIS community, and provide limited support to facilitate a community development effort.

The first of the above objectives has been met: as of March 1, 2005, the source code can now be downloaded for members of IRIS from Web site <http://www.iris.edu/manuals/sac/index.htm>. SAC, and its auxiliary graphics conversion program sgftops, have been built successfully on three operating systems: Sun Solaris (2.9), Mac OS X (10.3), and Linux (Redhat 8.0 and Debian). Pre-built binary executables for those operating systems can be downloaded from the same site. Links are also given to a SAC tutorial and users’ manual. (Much of the contents of the users’ manual can be accessed from within SAC using the help utility.)
