

Yet another module for reading WIN format data in ObsPy

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The ObsPy (Beyreuther *et al.*, 2010) is one of the common tools for processing seismic data. This tool can treat various formats of seismic data, of course including the WIN format. However, the original module for reading the WIN format data has some issues. The issues are: 1) bugs in decoding 0.5 bytes and 3 bytes compression data, 2) not treated properly with missing data and variable sampling rates, and 3) too slow. The third issue is a very serious problem reading large volume waveform datasets. For example, it takes 80 seconds to read a WIN format file containing 3000 channels data with one minute length. Major cause of these issues is that this original module was created by pure Python. Therefore, we have implemented yet another module for reading WIN format data. Features of our new module are: 1) reading the WIN format data and outputs the ObsPy Stream object, and 2) resolves above three issues in the original module. Calling shared libraries from Python is a typical technique to wrap the native libraries and improve execution times. Uehira *et al.* (2010) introduced shared libraries into the WIN system. The “libwinsystem.so” shared library provides various functions for reading or writing the WIN format data. Using this library for decoding the WIN compressed data in our module was effective in solving the first and third issues. To deal with second issue, when the gap of time stamps or sampling rates was found, our module separates waveform data properly. Reading a WIN format file using our module is about 8 times faster than the original module. We are planning to open our module to the public.

References:

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- 2) Uehira, K., T. Urabe, T. Tsuruoka and S. Nakagawa (2010), 64-bit compatibility of WIN system, SSJ Fall Meeting, C11-08.

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